United Nations
Educational, Scientific and
Cultural Organization

Man and
the Biosphere
Programme

EXTENSION DOSSIER

APPENNINO TOSCO EMILIANO

A MOSAIC OF DIVERSITY ACROSS THE APENNINIC CREST, A BORDER BETWEEN EUROPEAN AND MEDITERRANEAN CLIMATE

PART 1


Noceto
PARMA
Medesano
Collecchio
Sala Baganza
Felino
Fornovo di Taro
REGGIO NELL'EMILIA
MODENA
Lesignano De' Bagni
Quattro Castella
Albinea
Langhirano
Canossa
Vezzano sul Crostolo
SASSUOLO
FIORANO
Viano
Castellarano
Maranello
Casina
Berceto
Castelvetro di Modena
Borgo Val di Taro
Carpineti
Marano sul Panaro
Castelnuovo Ne' Monti
Serramazzoni
Guiglia
Pontremoli
Villa Minozzo
Zocca
Pavullo nel Frignano
Lama Mocogno
Villafranca in Lunigiana
Montese
Fivizzano
Sestola
Aulla
Fanano
Piazza al Serchio
Pieve Fosciana
LA SPEZIA
Barga
Luni
CARRARA
MASSA
0
10
20 km
City
Town
Township

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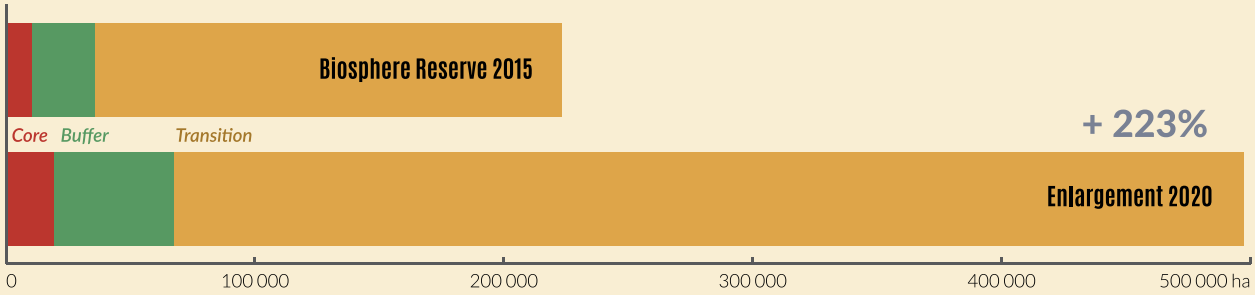
AND MEDITERRANEAN CLIMATE

PART 1

ENLARGEMENT AT A GLANCE - DEVELOPMENT AND LOGISTICS

EXTENSION OF THE BIOSPHERE RESERVE



MUNICIPALITIES

34

80

Regions

2 → 3

Provinces

5 → 6

POPULATION + 355%

	Biosphere Reserve 2015	Enlargement 2020
Permanent	*101 300 residents*	*378 424 residents*
Seasonal residents and tourists	*68 500 non-residents*	*146 500 non-residents*
Population density	*45 people/km²*	*76 people/km²*

NEW GENERATIONS + 425%

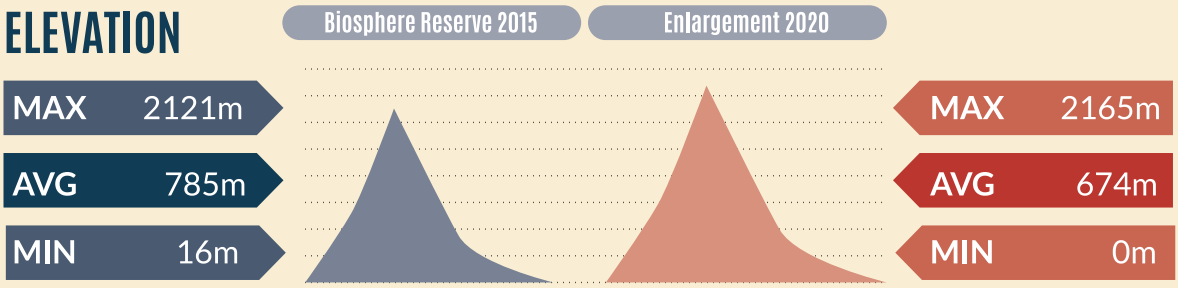
	13 286 under 18	*56 568 under 18*

EDUCATION + 412%

	212 institutes	*875 institutes*

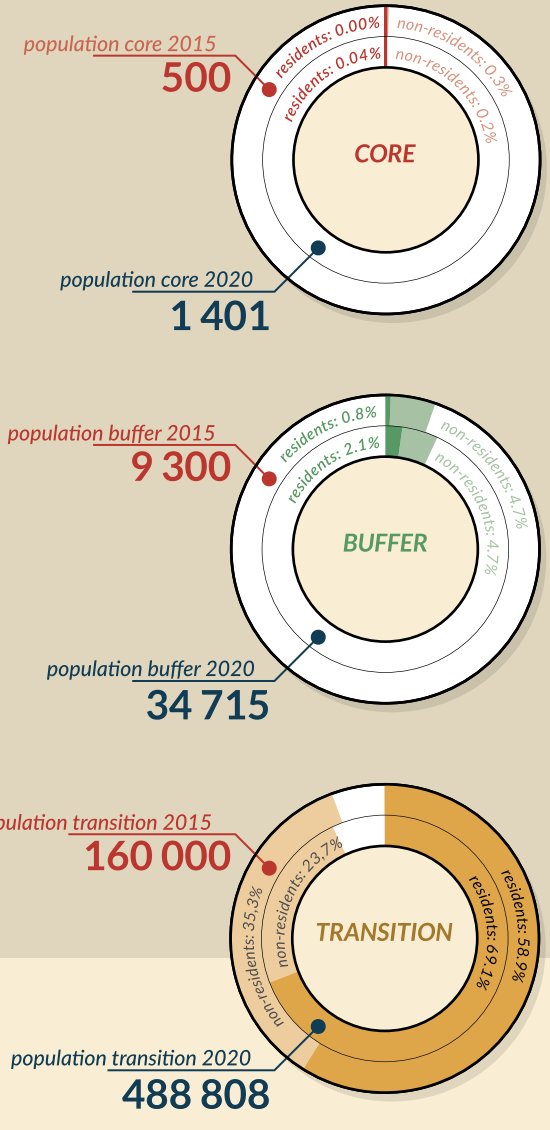
a comparison between the 2015 inscribed BR and the 2020 enlargement proposal

ELEVATION

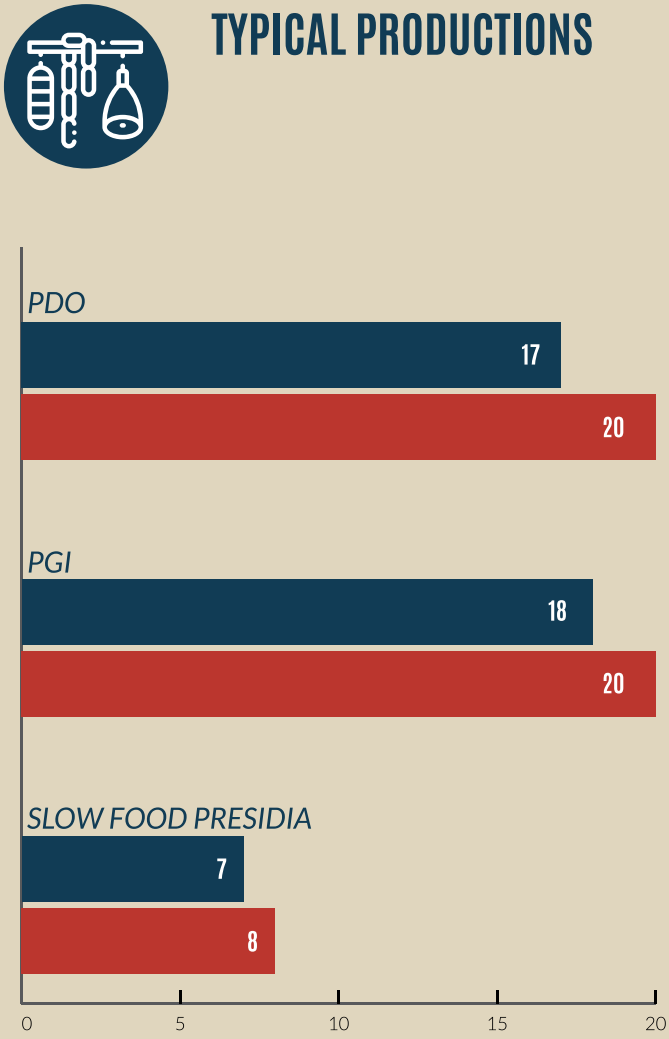


POPULATION DISTRIBUTION

within the Biosphere Reserve

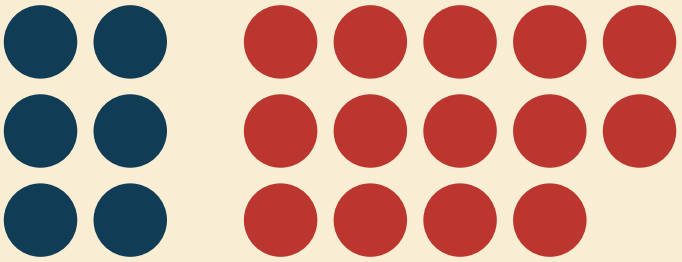


TYPICAL PRODUCTIONS



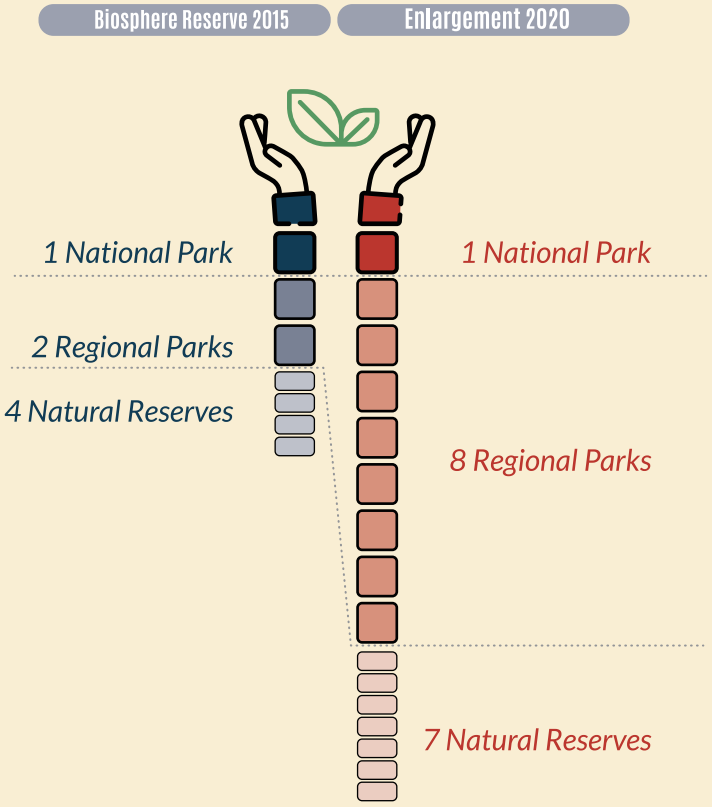
ENLARGEMENT AT A GLANCE - CONSERVATION

6
CORE AREAS
Biosphere Reserve 2015



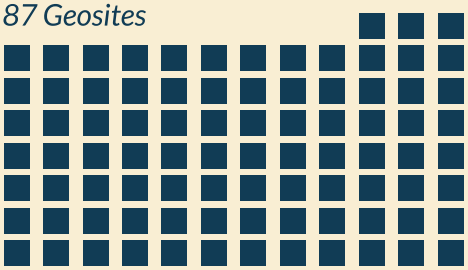
14
CORE AREAS
enlargement 2020

PROTECTED AREAS

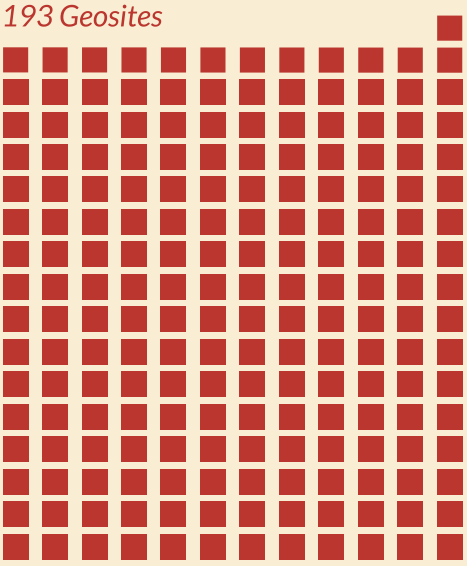


GEOSITES

87 Geosites



193 Geosites



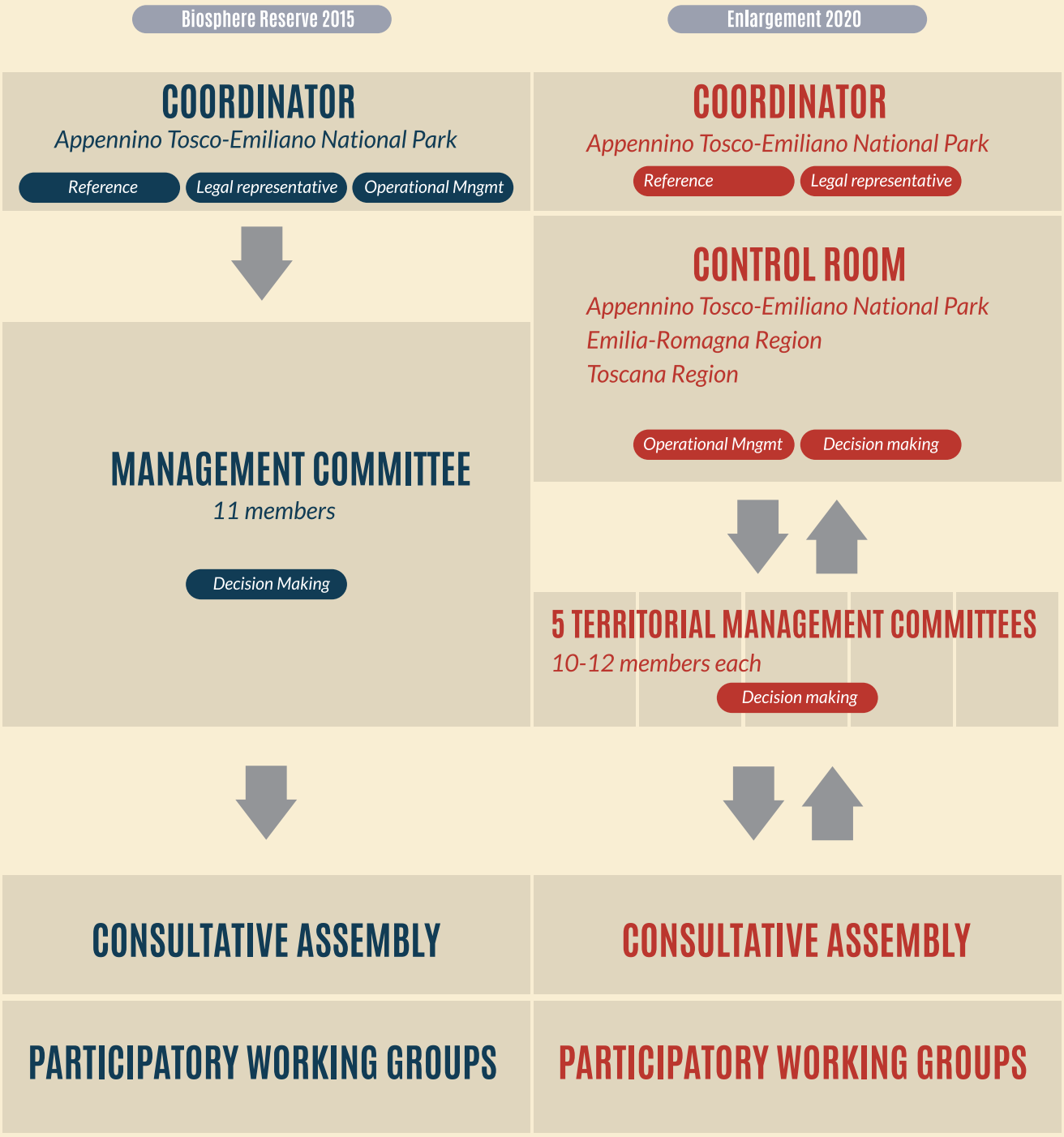
NATURA 2000 SITES

24 Natura 2000 sites	*40 Natura 2000 sites*

PROTECTED HABITATS

37 Habitats	*50 Habitats*

ENLARGEMENT AT A GLANCE - GOVERNANCE



ENLARGEMENT AT A GLANCE - SWOT ANALISYS

STRENGTHS

- Completion of the ridge area (climatic boundary)
- Completion of identity areas (Lunigiana and Garfagnana)
- Urban-mountain ratio for sustainability challenges
- Increase in the population involved, especially young people
- Involving multiple stakeholders in governance
- Stronger role of the Regions in operational management
- Entrepreneurial fabric more CSR-conscious
- Coordination between territories on the same river rod
- Expansion of the research institutes involved

WEAKNESSES

- Complexity of managing such a large area
- Administrative fragmentation

OPPORTUNITIES

- Collaborations in the Network of Biosphere Reserves
- Incorporating the projects of the incoming territories in the Biosphere Reserve action plan
- Ability to attract public and private funding to finance projects
- Growing sensitivity of global and local communities to the environment

THREATS

- Evolution of climate change
- Social and economic changes
- Evolution of the pandemic

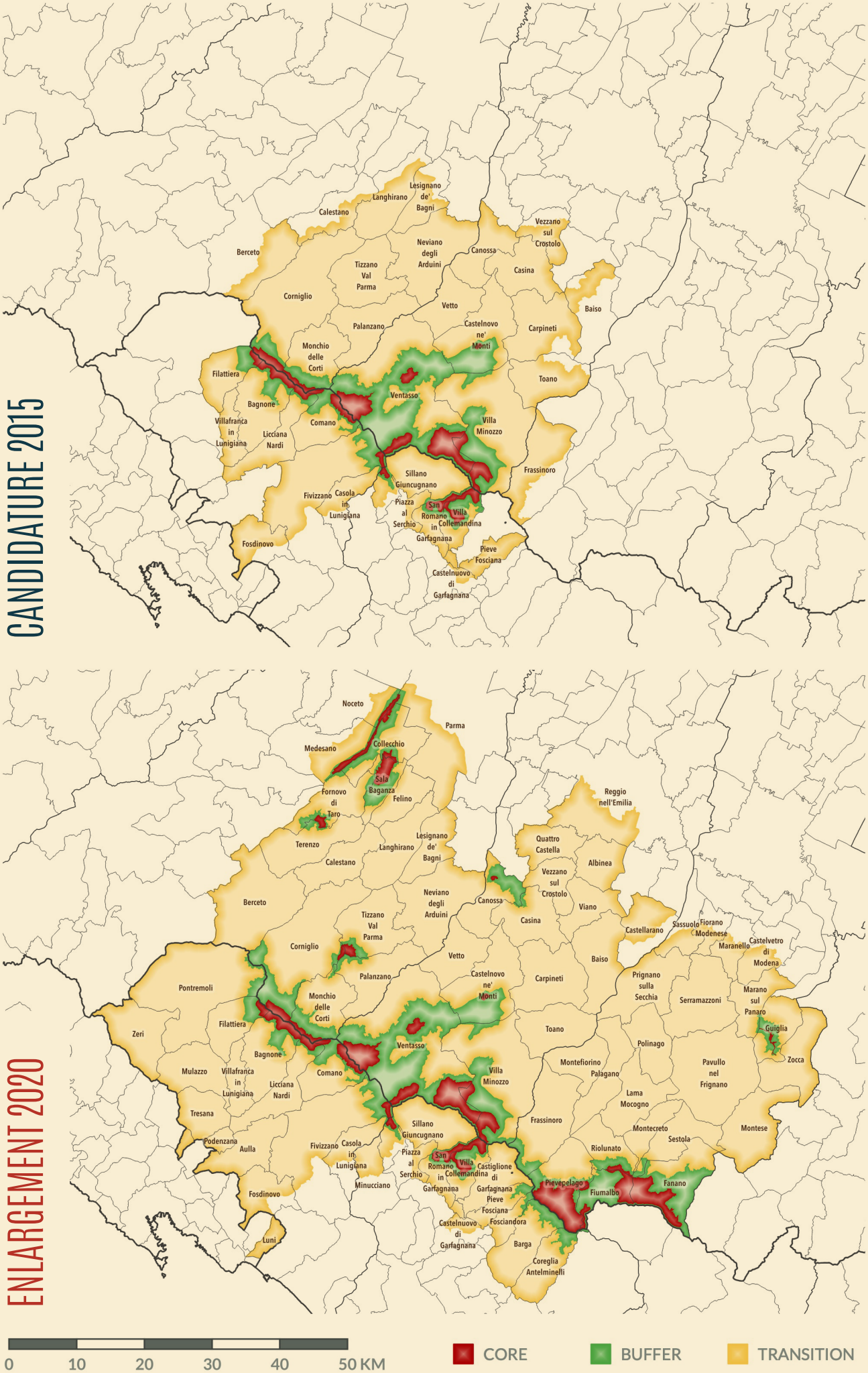

CANDIDATURE 2015
Lesignano de' Bagni
Langhirano
Calestano
Vezzano sul Crostolo
Neviano degli Arduini
Canossa
Berceto
Tizzano Val Parma
Casina
Corniglio
Vetto
Baiso
Palanzano
Castelnovo ne' Monti
Carpineti
Monchio delle Corti
Filattiera
Toano
Ventasso
Bagnone
Villa Minozzo
Villafranca in Lunigiana
Comano
Licciana Nardi
Frassinoro
Sillano Giuncugnano
Fivizzano
Casola in Lunigiana
Piazza al Serchio
San Romano in Garfagnana
Villa Collemandina
Fosdinovo
Pieve Fosciana
Castelnuovo di Garfagnana
ENLARGEMENT 2020
Noceto
Parma
Medesano
Collecchio
Sala Baganza
Felino
Fornovo di Taro
Reggio nell'Emilia
Terenzo
Langhirano
Lesignano de' Bagni
Quattro Castella
Albinea
Calestano
Vezzano sul Crostolo
Neviano degli Arduini
Canossa
Viano
Berceto
Tizzano Val Parma
Casina
Castellarano
Sassuolo
Fiorano Modenese
Maranello
Castelvetro di Modena
Corniglio
Vetto
Baiso
Palanzano
Castelnovo ne' Monti
Carpineti
Prignano sulla Secchia
Pontremoli
Monchio delle Corti
Serramazzoni
Marano sul Panaro
Filattiera
Toano
Guiglia
Zeri
Ventasso
Polinago
Bagnone
Montefiorino
Zocca
Mulazzo
Villafranca in Lunigiana
Comano
Villa Minozzo
Palagano
Pavullo nel Frignano
Licciana Nardi
Lama Mocogno
Tresana
Frassinoro
Sillano Giuncugnano
Montecreto
Montese
Podenzana
Aulla
Fivizzano
Casola in Lunigiana
Piazza al Serchio
San Romano in Garfagnana
Villa Collemandina
Castiglione di Garfagnana
Riolunato
Sestola
Minucciano
Pievepelago
Fiumalbo
Fanano
Fosdinovo
Garfagnana Pieve Fosciana
Fosciandora
Castelnuovo di Garfagnana
Luni
Barga
Coreglia Antelminelli
0
10
20
30
40
50 KM
CORE
BUFFER
TRANSITION

TABLE OF CONTENTS

PREFACE

The Appennino Tosco Emiliano Biosphere Reserve, 5 years after its birth, is implementing the actions envisaged in its Action Plan, aimed above all at fostering a process to increase both awareness and skills of human resources for the Apennines. We are working to improve sustainability awareness, biodiversity conservation and to fight climate change, by promoting the growth of responsible, resilient and successful communities and economies.

In the light of these first and positive experiences, the extension of the Appennino Tosco Emiliano Biosphere Reserve is proposed, also in relation to the fact that neighbouring territories that have environmental, historical and cultural affinities with the Biosphere reserve communities, have expressed a widespread and qualified interest to collaborate in pursuing the global and local objectives of the UNESCO MAB programme.

During the extension process, events of global significance occurred which further strengthened the willingness of the communities to participate in the territorial project of the Reserve. The worsening of the climate emergency has produced a new awareness, especially among the youngest, of the urgency to change, even radically, the priorities of development and to pursue environmental conservation and protection not only in parks but also in industrial districts and in peri-urban territories, through the implementation of good practices of sustainability and technological innovation. Furthermore, the current pandemic has undermined the idea that development can be independent of the quality of the territory and has strengthened, especially in those who live in urban areas, the awareness that availability of natural environments is extremely important.

For these reasons, the extension goes in the direction both of giving continuity to the Reserve along the Apennine watershed which is the climatic border between Europe and the Mediterranean, and of connecting it with the hilly and peri-urban areas, whose communities and economic districts are the main "consumers" of ecosystem services made available by natural areas.

The new Biosphere Reserve redefines the polarities, placing natural capitals at the centre of the area and the project and around them the consumers and the dynamics of urbanization and economic development.

The extension process has solid roots, but it is also a further challenge: it is a "urban-mountain pact", a new model that provides for collaborations and exchanges and allows the Apennines to integrate and positively influence the development of the regions in which it is inserted. This is a higher challenge, connected to the European green deal, which requires and allows an expansion of the human resources involved, through participation and territorial alliances. It therefore addresses the communities, not only those present on the Apennine ridge, but also over a large territory between the Via Emilia and the Ligurian and Tyrrhenian seas. In the candidate territory there are excellences such as the CNR Institute of Atmospheric Sciences and Climate of Cimone, the Technopole of the University of Modena and Reggio Emilia, the cultural pilgrimage itineraries and the networks of castles and historic houses of Garfagnana and Lunigiana, the agri-food sector of Parma, up to the contact with the districts of mechatronics, ceramics and the Ligurian-Tuscan coastal tourist belt.

Starting from the issues that today represent the strengths, the extension allows the Biosphere Reserve to expand its action to 360 °, therefore overcoming its original mission of sustainability by including the beneficiaries of the services generated by the natural capital and strengthening connection and interdependence between urban and rural areas. This requires and justifies a strengthening of governance, strongly based on participation, which in this proposal is further articulated on a territorial basis and strengthened by giving a more relevant role to the Regions of Tuscany and Emilia Romagna.

Fausto Giovanelli

1. PROPOSED NAME OF THE BIOSPHERE RESERVE

The proposed name is
APPENNINO TOSCO-EMILIANO MAN & BIOSPHERE RESERVE

REASON

The area has already been designated as Reserve in the framework of the UNESCO's MaB programme on the June, 9 2015 with the same name.

This dossier is a proposal of extension of the existing Biosphere Reserve, therefore we propose to keep the same designation.

2. NAME OF THE COUNTRY

ITALY

The Biosphere Reserve falls completely in the Italian territory.

3. FULFILLMENT OF THE THREE FUNCTIONS OF BIOSPHERE RESERVES

The document represents a proposal to enlarge the Appennino Tosco-Emiliano Biosphere Reserve to large territories and communities not included in the 2014 Dossier. In the process of expansion, the new territories have expressed their adherence to the mission of the MaB programme that emerged as a global and local programme of growing interest and modernity.

The general mission therefore remains confirmed, while the operational and participation potentials for the performance of the three functions of the Biosphere Reserve (Conservation, Development, Logistic Support) are enhanced.

3.1. **CONSERVATION** - CONTRIBUTE TO THE CONSERVATION OF LANDSCAPES, ECOSYSTEMS, SPECIES AND GENETIC VARIATION

The Apennines, part of the Alpine-Himalayan belt, are a mountain range forming the backbone of the Italian peninsula. The Reserve area, located in the Northern Apennines, is typical of this mountain region, but also has a unique feature: it is a focal point of the Continental-Mediterranean climatic boundary which, together with geological heritage and other factors, has given rise to a complex ecological and cultural patchwork, which, in turn, forms the basis for the evolution of the landscape and is highly exposed to climate change.

A main feature of the Apennine Tosco-Emiliano is a centuries-old stratification of the land related to the dynamic balance between a strong and vibrant natural area and human inhabitation: The Apennine backbone has always been a natural corridor: a conservation area for a multitude of habitats across which man travelled, and which he knew how to exploit as a crossroads of trade and cultural exchange. Man (who has encouraged functional biodiversity for survival and socio-economic development) and the numerous endemic species bound by the area's unique climate (which, in recent decades, as a result of the gradual desertion of these areas, are becoming more resilient), coexist in an area that needs to be protected and studied, notably in this phase of climate change acceleration. It is here that man has not only selected/introduced new species over the centuries but has also managed to adapt and exploit the natural resources of the territory itself, safeguarding them intuitively and adapting to the uniqueness of its geology, morphology, climate, botany and fauna.

This has led to the landscape being fragmented into several pieces, which currently comprise of exclusive traditional agricultural food production – including PDO Parmigiano-Reggiano cheese and its forager "habitats"-, and woodland areas or grasslands at high altitudes, which have contributed to increasing overall biodiversity. This complex patchwork of biodiversity has encouraged many forms of culture, mostly relating to rural life, which, throughout history, have distinguished the resident populations – from the Liguri, Apuani and Frignati to Roman colonists - and, of which, traces are still evident such as the historical routes such as the Roman roads between Parma-Luni-Lucca, the hinge between the consular Via Emilia and Aurelia and in the architectural traces such as the mighty fortification that finds its origins during the Longobard-Byzantine wars between 550-700 AD. and which then characterized the Middle Ages, especially during the Matildic era. Examples of this patchwork are the many

traditional niche products that are true sociological archetypes, in unique and original popular traditions still alive (dramatic "May")

The nomination for Biosphere Reserve, within the framework of the Man And Biosphere UNESCO programme, thus intends to formalise the collective and perceived need to maintain this balance, which is currently under threat due to the progressive and partial loss of human resources and the desertion of a rural lifestyle, as well as to climate and cultural changes in relation to which current conservation policies only acknowledge specific sectors and do not have an all-inclusive approach. The effectiveness and operation in the area following its designation as Biosphere Reserve have led to renewed interest also in the neighbouring territories, the closest beneficiaries of ecosystemic services in the ridge areas. This growing interest has led into the extension proposal that is the subject of this dossier.

Rosalia alpina Linnaeus, 1758
The beech cerambice is one of the target species of the LIFE 14 NAT / IT / 000209 project, which involves several partners within the candidate Biosphere Reserve area

3.2. **DEVELOPMENT** - FOSTER ECONOMIC AND HUMAN DEVELOPMENT WHICH IS SOCIO-CULTURALLY AND ECOLOGICALLY SUSTAINABLE

Through its governance model, the Appennino Tosco-Emiliano Biosphere Reserve tried to steer, encourage and formalise interventions and strategies for the development of innovation and sustainability, which have been outlined and are being carried out, by most administrative, entrepreneurial and social organisations in the area, but are difficult to implement.

The extension application process aims to bring about an increase in cultural development and awareness to encourage wider local communities to recognize the value of ecosystem services of which they are the first beneficiaries and therefore to invest in motivating and training people, particularly young people. The aim is not "solely" to get them to stay on the land, but to give them the opportunities to be - within the broader cultural, educational and economic circuits – a lever of investments in the conservation and development of ecosystem services that arise from the reserve.

The main "infrastructure" in which the territory now needs to invest most heavily is human capital, in order to increase its value: a human capital that needs to be made more aware of and better trained in the values and merits of its territory, and to understand its currently interesting potential both nationally and internationally. Human capital could, thus, become the key player in new lifestyles and ways of working that typify a modern rural community, which, thanks to smartworking and sustainable tourism, will not be stuck in the past, or isolated on the Apennine ridge, but connected and in tune with the patterns of the era of globalisation.

Broader local communities need to become active in and responsible for protecting and developing the MaB reserve, turning it into a laboratory for innovation and sustainable development. This laboratory will be implemented in several main areas, which nowadays can be more closely linked: continuity/innovation of rural activities, historically dominated by traditional and high-quality production, which have helped shape the unique features of the area's agricultural landscape; promotion of ecotourism, a new opportunity but also an instrument of knowledge; a residence / work / jobs with the settlement of new people that can be useful and possible with remote work.

3.3. **LOGISTIC SUPPORT** - SUPPORT FOR DEMONSTRATION PROJECTS, ENVIRONMENTAL EDUCATION AND TRAINING, RESEARCH AND MONITORING RELATED TO LOCAL, REGIONAL, NATIONAL AND GLOBAL ISSUES OF CONSERVATION AND SUSTAINABLE DEVELOPMENT

The aim of the Appennino Tosco-Emiliano Reserve is to perform a supporting role, presenting itself to the territory as a "laboratory of concrete ideas", encouraging the sharing of objectives and projects and providing a network of partnerships and expertise. Along this line, the Action Plan of the Reserve currently being implemented is pursuing the objective of increasing awareness of the Apennines and for the Apennines, in line with the 17 Sustainable Development Goals of the UN and the Lima Plan of the UNESCO MaB Program. (see chapter 17). In particular, the Reserve performs its support function in three main areas: education for the environment, sustainability and the enhancement of natural and cultural capital; innovation through demonstration projects in the field of sustainable tourism, conservation and enhancement of cultivated and raised biodiversity, research, monitoring and control of CO2 emissions in agriculture and forests

"Education" on sustainability is not intended solely for students, but also for the local community, economic operators and visitors. It will be executed using an approach based on innovation, experimentation and practical experience of sustainability. Starting from the understanding and experimentation of natural phenomena in general, environmental education is and will be developed together with the knowledge of the territory intended as a preferential didactic classroom in its complexity. One of the primary missions of UNESCO is the strengthening of human capital and the school is the most appropriate habitat; for this reason, since 2014 the network of "schools in the National Park" has opened to the 34 Municipalities of the Biosphere Reserve. recognized, involving over 30 public educational institutions (out of 32 present) in the area. The Three-year Education Offer Plans (PTOF) of schools, decline not only the formal adherence of the territories to the principles and objectives deriving from being a Biosphere Reserve, but also the effective organization, through planning and training actions dedicated to teaching staff and students, the participatory construction of territorial identity, based on the values of the environment and landscape and on education for sustainable development. Collaborative

DETAILS

The complete list of projects and activities in progress, related to training and education is presented in chapter 16.2.1 of this dossier.

projects are underway between the various schools in the various territories and projects based on mutual knowledge and exchanges.

The didactic plans, built during each school year starting from the three training seminars (September 2014, September 2015, September 2016) for teachers and managers who have unraveled the theme of the UNESCO Reserve ("Nome in Codice Appennino", "Scambi il valore della relazione e del dialogo culturale", "Trame: la grammatica degli scambi tra locale e globale"- Code name: Appennino, Exchanges: the value of relationship and cultural dialogue ,Plots: the grammar of exchanges between local and global) and saw the participation of over 360 teachers and school managers.

The Appennino Tosco-Emiliano Biosphere Reserve makes the most of the presence of a network of Universities (in particular Bologna, Modena e Reggio, Parma, Florence, Rome, Pisa) multi-disciplinary research projects and monitoring carried out over the last decade. With a particular focus on climate change, it promotes pilot projects for the preservation of biodiversity and research on specific ecosystems. This

PROJECTS HAVING GREAT IMPACT RELATED TO THE LOGISTIC SUPPORT CURRENTLY IN PROGRESS IN THE RESERVE

DI ONDA IN ONDA

FROM WAVE TO WAVE

Atelier delle Acque e delle Energie (Atelier of Water and Energy) – with the support of Reggio Children – aims to experience physical phenomena and material qualities of water and energy by developing the following themes: The poetics of nature, Snow and nature in the Apennines, Apennine Geosphere.

DEDALUS

Atelier della Natura di Appennino (Atelier of Apennines Wildlife), with the support of a private entity - Cerwood - aims to identify innovative solutions for communicating the values of biodiversity, natural heritage and nature conservation.

CENTRO UOMINI E FORESTE PER L'APPENNINO

MEN AND FORESTS CENTRE OF THE APENNINES

A project and ongoing action which is above all a cultural reference point, to increase the knowledge, skills and responsibility of all the various public and private actors and users in the forestry sector (forest culture) with a view to safeguarding and improve the ability of the large forest heritage to absorb and retain carbon dioxide.

high-level research facilitates a cultural ferment, capable of stimulating a drive towards innovation and continuous improvement within the territory.

With regards to tourism, the Appennino Tosco-Emiliano Reserve intends to: develop the innovative and positive experiences of the "Turismo di Comunità" (Community Tourism), which has been active in some villages on the ridge for several years; highlight the territory's points of excellence identified in this candidature; generate a new awareness of the Reserve's values within the local communities by involving them not only for their tourist hospitality services, but also in performing a permanent, informative-educational role in order to share and understand the territory's values with visitors. An important challenge for the future of the Reserve will concern sustainable tourism, the ability to adapt facilities to the ongoing climate and cultural changes. The main aim is to carry out the aforementioned objective of making the territory more attractive by fulfilling the policies implemented in recent years to enhance its geographical, ecological and cultural identity and lessen tourism's dependence on seasonal factors, in order to ensure the most widespread distribution of tourists.

In relation to rural development, the Biosphere reserve aims to consolidate model experiences directed at recovering and, at the same time renovating and promoting a high-quality, endemic agro-silvo-pastoral culture, by encouraging those productions which can better contribute to protecting the reserve and passing values and merits on to the consumer, as well as serving as a marketing tool for the territory. This approach tends to revitalise rural communities, giving them back a renewed role in overseeing and protecting the territory.

The supporting roles will be implemented through a network of partnerships involving parties outside the territory of the Appennino Tosco-Emiliano reserve, who see an opportunity to experiment with replicable models in the area, as well as in other contexts.

The new dimension proposed for the Reserve will make it possible to draw on an even wider number of participants, of cultural centres, associations and human resources in general that can be used. In particular, after the most critical part of the pandemic, the widespread awareness of the need to integrate the specificities, the excellences and the related services present in rural areas into the opportunities and lifestyles of urban areas has recently matured. This need also concerns public programming and is aimed at partnerships between territories (so-called rurbanization or urban-mountain pacts). The path leading to the expansion of the Reserve is consistent with the strong current interdependence between life, needs, reality, of urban areas and rural areas that are increasingly interconnected.

4. CRITERIA FOR DESIGNATION AS A BIOSPHERE RESERVE

4.1. ENCOMPASS A MOSAIC OF ECOLOGICAL SYSTEMS REPRESENTATIVE OF MAJOR BIOGEOGRAPHIC REGION(S), INCLUDING A GRADATION OF HUMAN INTERVENTIONS

The candidate area is part of the Palearctic biogeographic region (northern Eurasia and Africa) and is affected by the presence of the climatic boundary between two biogeographic regions: the so-called "Euro-Mediterranean" boundary, which divides the Continental and Mediterranean climate zones. The Reserve area therefore summarizes in a single governance ecosystems, landscapes, and cultures of the Tyrrhenian, Po valley and Apennine areas united since ages by a network of exchange relations ships between the two regions – The Po Valley and the Ligurian/ Tyrrhenian seas – that have been the on which important human settlements were present since pre-Roman times.

The ridge, a morpho-structural formation positioned in a NW/SE direction, displays features that are extremely different to the predominant patterns in the rest of the Apennines, this section of which corresponds to the Tyrrhenian coastline of the Riviera di Levante, as well as the course of the central section of the Po Valley plain.

The southern and northern slopes of the ridge are extremely different from one another, in terms of climatic conditions as well as their specific orography. This differentiation is the basis of the high biodiversity and the distribution of ecosystems along the valleys. Clearly the morphologies and ecosystems also conditioned human presence, but also anthropic activities accompanied and affected ecosystems in a synergistic relationship for thousands of years.

The complex relationships between vegetation, soils, biosphere, geomorphology and climate allow the Reserve to act as an important laboratory for understanding the territory-climate link and for sensitively and promptly recording the ongoing climate changes through the oscillations on the border between the two climate areas.

To classify the ecological mosaics within the Reserve, an orographic principle could be applied, dividing them into:

1. A high-altitude section in the vicinity of the ridge;
2. A hill section that extends around the high-altitude ridge sections, almost surrounding them;
3. A strip of plain close to the hilly area.

The Core Areas defined in this candidacy coincide with the main and secondary ridge bands and with the main biodiversity reservoirs. They are therefore characterized by a morphological prominence and high degrees of naturalness. The hilly passage mainly coincides with the Buffer and Transition Areas and often has significant levels of protection. In the Buffer Areas the anthropogenic presence is widespread but without important inhabited centres. Most of the population of the Biosphere Reserve resides in the Transition area and is concentrated in the valley bottoms and in the plain belt.

RIDGE SECTION

We shall define the range of this section as comprising the high-altitude section and the ridge, 2165 m to 800 m asl, and also extending to the main longitudinal ridges that make up the predominant course of the ridge to the plain areas.

The ridge has an almost continuous longitudinal course, interrupted only by the Apennine passes. Geographical continuity is reflected in the ecological continuity, also thanks to the reduced human presence, with a stratification of vegetation from broad-leaved / beech forests, conifers up to high-altitude grasslands. The broad-leaved woods and beech forests occupy a wide altitude range (between 800 and 1,600 m above sea level) in which the climate is moderately and constantly humid, with high rainfall and no dry periods. With rare exceptions, the beech forest is in the form of coppice, slowly started, naturally or artificially in certain high forest areas.

The mountains that define the ridge are often imposing with gentle as well as wild summit morphologies, with cirques of glacial origin. Two main slopes branch off from the ridge characterized by important morphological differences.

The northern slope is wide and slopes gently and fairly evenly towards the Po Valley. Starting from the top of the main ridge and descending in altitude, there is a wide area displaying signs of ancient glaciers, with elongated bumps stretching along the flow of the ancient masses of ice: these are moraines that mark the frontal and lateral perimeters of the ice tongues, wide valleys with the typical "U" conformation and numerous lakes and relict wetlands

The continuous alternation of more or less permeable rocks determines favourable conditions for the storage of water (reservoir rocks) and consequently for the determination of complex spring systems on the one hand, and for the creation of deep carved valleys on the other. Due to phenomena of capture and progression of the incisions in parallel with the elevation of the Apennine chain, the hydrographic network is articulated and, in some cases, it gives rise to phenomena of great beauty such as "cracks", and the majestic valleys carved by large watercourses.

Water is an element of great richness and subtle appeal. The water collected along the ridge in abundant quantities returns to the river Po, through the Secchia, Enza, Parma and Panaro rivers an average water flow rate of 65.4 m3 / s and a flood flow with values that exceed even 4,000 m3 / sec. The hydrographic network that crosses the Biosphere Reserve is homogeneous and plays a strategic role in quality agri-food production, in the production of sustainable energy, in teaching and in the conservation of ecosystems.

The alternation of different lithologies has determined the definition of some hills along the secondary ridges, capable of transmitting a high aesthetic and symbolic potential through scenic aspects such as verticality or chromatic contrasts. In particular, some calcarenite units have given rise, at the edge of the northern ridge, to small plateaus supported by vertical rocky outlines surrounded by gentle grassy and wooded undulations (Pietra di Bismantova).

Contrarily to the northern slope, the southern slope is extremely steep and relatively uniform in terms of its morphology, which is characterised by deep, V-shaped fluvial incisions. The morphological evolution was based on a tectonic structure marked by the presence of large valleys (called graben by geologists) delimited by medium angle faults - which develop parallel to the ridge. The presence of arenaceous rocks and the strong erosive action of the streams determines generally steep slopes; the hydrographic network is strongly

conditioned by the discontinuities of the rocks. The signs of glacial morphology are very limited due to exposure factors.

In these areas, pseudo-vertical drops from the ridge have frequently developed, featuring accompanying pioneer vegetation and widely distributed small wild fruits. The slope displays established arboreal vegetation: in the lower altitude sections hornbeam oak, in the higher altitude areas beech trees including pastures obtained from former beech tree areas and in the areas close to the peak of the Apennine ridge pastures deriving from blueberry plants.

Towards the higher altitude sections and on the shelves corresponding to lithological changes bottom-up throughout the slope, we can see a specific, albeit intricate, sequence of woods, ridge grasslands and rocky outcrops.

Levels of rainfall are lower on average than on the northern slope.

The geomorphological appearance of the landscape contributes to defining this area of the ridge where the steepness of the main slope and secondary slopes becomes more accentuated, often resulting in an area that is in sharp contrast to the overall gradient of steepness. The absence of any kind of permanent settlement (communities or villages), except for a few rare examples of isolated buildings or seasonal alpine pastures, and, at the same time, the absence of any infrastructure, represents one of the key characteristics of the southern slope of the ridge.

Here, the landscape is divided very evenly into ridge grasslands, rocky outcrops and woodland. This evenly divided layout can also be noted progressing constantly from the bottom towards the top of the slope.

The Apennine passes that connect the two sides therefore constitute the natural connection and the point of contact and exchange between very different territories. They have been the cornerstone of the relations between the populations who have lived and live in the reserve, affecting the possibility of accessing the places (transhumance trade to the Maremma, pilgrimage to Rome, banditry, resistance) and to control them.

To understand the symbolic and strategic potential of the ridge, suffice it to say of the widespread presence of the "Cappellette Maestà" (chapels of saints - ex votos) often decorated with marble materials from the Apuan Alps or carved into local limestone rocks, distributed along the preferential routes of the pass.

The routes of the main passes, which led from the Po Valley to the lands of Lunigiana and Garfagnana and vice versa, identify territorial traits highlighted by specific attitudinal characteristics, defining five typological sections, however, referable to the ridge in its complexity. These are:

1. Section from Passo della Cisa to Passo di Lagastrello (including Passo del Cirone)

2. Section from Passo di Lagastrello to Passo del Cerreto/Ospedalaccio

3. Section from Passo del Cerreto/Ospedalaccio to Passo di Pradarena

4. Section from Passo di Pradarena to Passo delle Radici (including Passo delle Forbici)

5. Section from Passo delle Radici to Passo dei Tre Termini (including Passo del Saltello, Passo di Foce Giovo, Passo dell'Abetone, Passo della Croce Arcana).

HILL SECTION

THE EMILIAN HILL SECTION

The altitudinal range of this section is between 800m above sea level and 150m above sea level. The section is the northern area connecting the Tuscan-Emilian Apennine ridge and the Po Valley.

Main lithotypes are: sandstone, marl and clays; there are also outcrops of gypsum and volcanic rocks. The sandstones in the medium and high hills are progressively replaced by clays that predominate in the low hills. The contemporary combination and contrast of hard rocks (sandstone, marl, ophiolites) and plastic ones (clays) and the action of selective erosion, have given rise to a landscape characterized by massive reliefs with steep walls that rise above clayey formations with morphologies often gullies. Being competent rocks and difficult to erode, the sandstones give rise to spiers, pinnacles and walls of rare beauty (e.g. Monte Caio, Sassi di Roccamalatina). Ancient remains of an ocean that has now disappeared, ophiolites are instead ancient lavas that formed the seabed and that are now elevated to form some of the most important peaks in the secondary ridges of the provinces of Parma and Reggio Emilia. Peculiar not only for the composition but also for the dark colours (red, black, green) that characterize them, these peaks constitute a unique substrate for the vegetation of the Emilian hills. Among them we remember Monte Prinzera and the Rupe di Campotrera, both areas designated for a conservation function (core areas).

The entire hilly area is characterized by a wide diversity and rapid variability of environments: from the wooded nature of the most inaccessible areas abandoned by agricultural activity, to the forage crops for the production of Parmigiano Reggiano, from the woods of Scots pine to the chestnut groves, from a dense network of castles, parish churches, villages, oratories, ancient roads and towers which together constitute the most evident traces of the great historical-cultural background of the hill.

Since ancient times, these sections have been used for specific activities relating to the production of certain goods (ham, mature Parmesan cheese and even chestnuts). Over the centuries, these activities have contributed to shaping the local landscape, becoming important pieces within the rich, varied ecological mosaic. The predominant forms of land use are, therefore, arable land, especially for growing fodder for the animals used in the production of dairy products, and forests of broad-leaved trees (downy oak, Turkey oak and hop hornbeam), pine trees (Scots pine) and chestnut trees. The most significant changes over the last few decades are related to the decrease in arable land and open areas in favour of wooded areas, which can generally be attributed to the albeit small decline in the use of the land for agriculture.

In these sections, landslides are extremely important, in terms of their impact on the management of the land and settlement activity in the area, as well as their contribution to ecosystem changes.

When it comes to the issue of hydrogeological instability, the area is one of the zones most prone to landslides in the Emilia-Romagna region. More than 4,000 phenomena relating to hydrogeological instability affect 24.7% of the hilly and mountainous terrain in the area. The phenomena are mainly brought about by clay lithotypes, such as the repositioning of ancient, loose bodies which are unearthed following substantial rainfall or the melting of a snow cover.

Settlements are present, featuring a generally discontinuous fabric which is in some cases, sparse.

THE LUNIGIANA HILL SECTION

This section of the Biosphere Reserve area is characterised by a network of fairly gentle hills and valley systems that are intricate but not particularly steep.

We can note clear signs of major neotectonic movements, which are emphasised by recent and ongoing intense erosion which has affected this area. The presence of the edges of fluvial terraces located at an altitude of up to 600m above sea level, widespread landslides and recessed streambeds that have undergone intense erosion is set against the distribution of lithotypes of the area. The hydrographic network is defined by substantial water systems which flow predominantly through natural environments.

Sometimes the mild diffuse reliefs are attributable to the presence of fluvial-lacustrine sediments, now raised above the valley floor; deposited within graben during the relaxation phase, they recorded the compression phases of the nearby Apennine ridge. The rocks of the substrate, mainly calcareous-marly and to a lower extent clayey, emerge where the erosive action of the watercourses was more intense and many hilly elevations have been formed from extremely loose clay and calcareous-marl rocks with a highly complex tectonic history.

The land is notably used for farming specialised crops (olive groves), which alternate, at a rhythm that matches the course of the hills, with chestnut and hop hornbeam trees. Woodland has remained in the zones that are less suited to the integration of olive groves.

In the higher altitude sections, we can find chestnut and beech trees, as well as Turkey oaks, and grasslands, obtained from former beech tree areas, which are intended for use as pastures. Farmed areas are found in the flatter section and in the foothills of the area. This is mainly made up of arable land and horticultural crop cultivations. In some areas of the hill, between an altitude of 300m above sea level and 400m above sea level, olive groves are farmed. Throughout history, agriculture in the area has generally retained its status as an important productive activity.

The area, which began to be urbanised as early as Roman times, still today features a system of settlements, all of which are similar to one another and have retained their original identity and structural characteristics. They are found in the middle section of the hill. Here, traditional rural houses still today retain their identity and specific structural characteristics.

These settlements reflect a positive image of the landscape linked to the presence of urban structures and the beauty of the agricultural environment surrounding the settlements, which then gives way to thick woodland.

THE GARFAGNANA HILL SECTION

From a morphological point of view, the area is structured around the Serchio river network and the mountain slopes from which water flows into it. The mountain slopes – the Apennine slope on the left bank and the Apuan slope of the right slope – come together at the head of the valley, beyond Piazza al Serchio, in the Argegna and Carpinelli mountain pass area, to

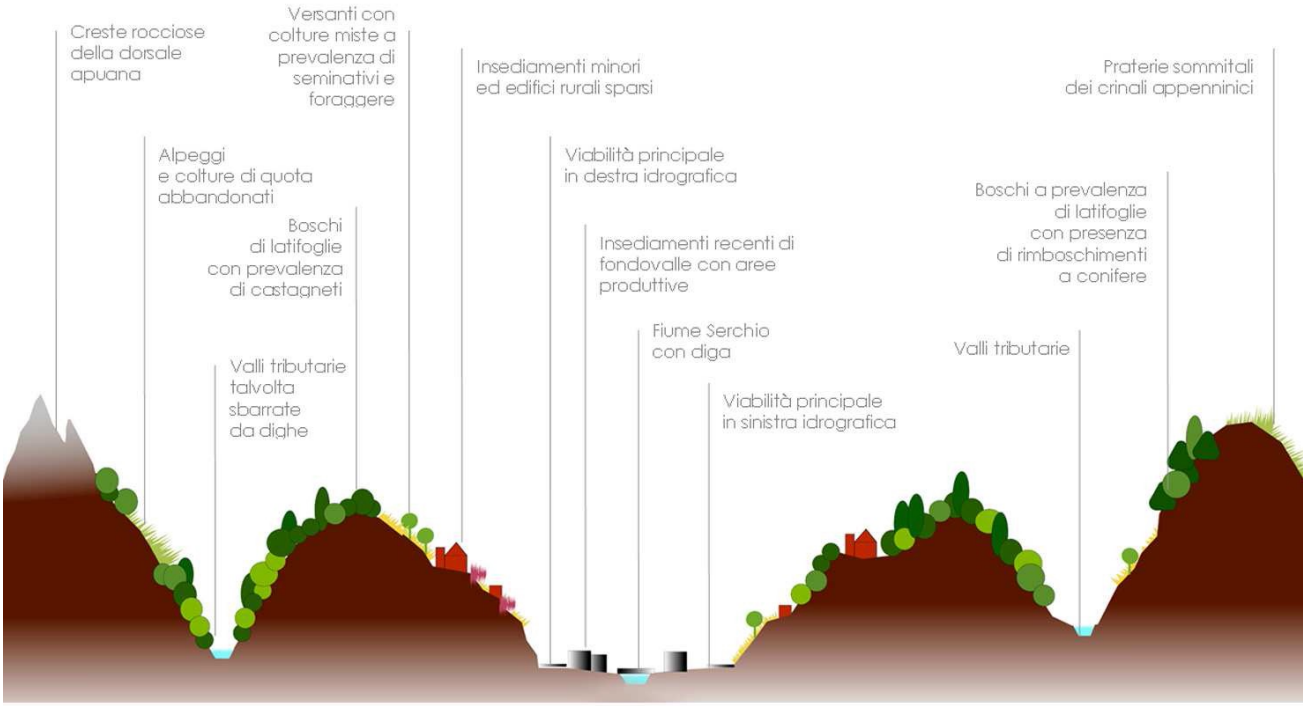
form what is known as a saddle, a delicate environment which in this case divides the Garfagnana and Lunigiana areas.

In terms of orography, the Garfagnana area is one of the so-called tectonic basins that characterise sub-Apennine Tuscany. Its geological structure consisting of a narrow valley between two vast mountain ranges – the Apennines and the Apuan Alps – gives it a particularly marked mountainous identity.

The Apennine mountain slope is that included within the current proposal of expansion of the Biosphere reserve. The slope progresses gently and gradually, despite its high-altitude sections. Its hydrographic network is close and irregular, while its valleys are short and steep, and its watercourses have a torrential regime.

All across the valley, watercourses stand out as key elements within the landscape, helping to pinpoint different local areas and making it possible to identify both the morphological structure of the land and the structure of ancient settlements.

These settlements, which take the form of communities or hamlets, many of which are relatively small, are mainly found in the middle section of the slope, further up than the flood plain but before the mountainous elevations, the start of which is marked by the change in land use (with arable land giving way to mainly chestnut and beech trees). By looking at the development of settlements in the area, we can clearly note the way that land use has been influenced by the need to preserve agricultural resources. The fact that the majority of settlements are found in the middle section of the slope (500-800m) highlights the way that agricultural activity has been organised, as well as demonstrating the relationship between agricultural activity and intense livestock rearing, complementary practices that have been brought together. In the lower part of

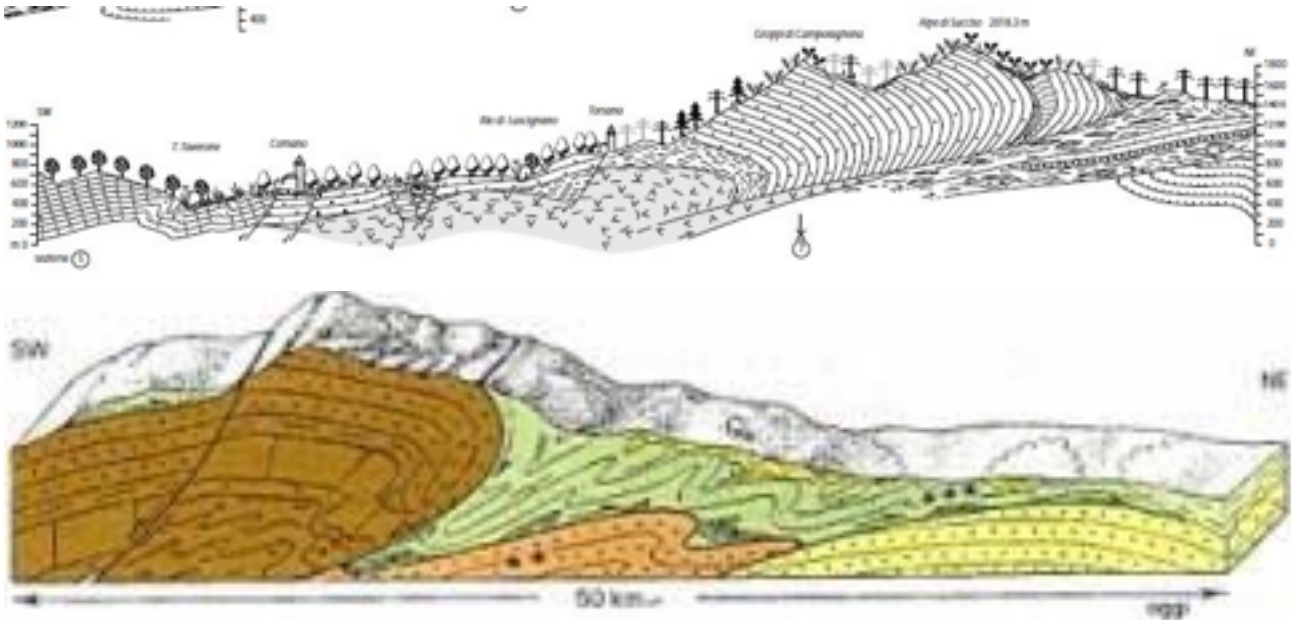


■ *Figure 4.1 - Hilly area of Garfagnana – outline*

the section, we can note the presence of contour ploughing, a sign of the intensive exploitation of the land; the upper part corresponds with the point at which the use of the land changes, with grasslands and pastures giving way to activities linked to woodland resources. Mountain soil, derive from the Macigno (Chapter 11.4 – Turbidites), therefore contains a higher degree of acidity and, as a result, are conducive to the growing of chestnut trees. Chestnut trees grow in the shelter of the mountain grasslands and extend up to the point that marks the start of arable land developed around ancient settlements.

The dominant forest formations are the beech woods at higher altitudes and the chestnut woods on the lower slopes, but there is also a significant and widespread presence of oak woods and forests dominated by thermophilic deciduous broad-leaved trees. The Garfagnana, among all the areas of the Tuscan mountain, is the one that has the greatest number of biotopes of vegetational interest (to be noted, among others, some botanical rarities such as the shrubs of holm oak and Phoenician juniper on rocky cliffs in the valley of the Turrite Secca). The banks of the waterways have a rich variety of riparian vegetation ranging from red willow to bitter willow, present almost everywhere, from goat willow to Cornelian cherry dogwood.

The significant diversification within the agricultural mosaic found in the middle section of the slopes of the main valley – as shown by the alternation of arable



- *Figure 4.2 - 1 Subsurface geology, geomorphology and different vegetation coverage across the ridge slopes*

land, pastures, woodland zones, and vineyards growing along cliffs and ridges – helps to maintain high levels of biodiversity.

Settlements in the area comprise flood plain communities, a few rare mountain communities, settlements around mountain passes and alpine pastures. These settlements are linked by an extensive road and infrastructure network, along which churches and hospitals have been built, and rural communities established. This network also feeds into other functional routes that connect the area with the sea to facilitate the provision of salt and the transportation of iron ore.

PRE-HILL AND UPPER PLAIN SECTION

Developed mainly along the northern slope, due to the natural connection with the Po valley, this area is morphologically characterized by the valley outlets at the edge of the Apennines through a strip of alluvial fans deposited by the tributaries of the Po river. In this sector the fluvial dynamics is characterized from the repeated digressions of the rivers whose traces are preserved by the bumps: depositional reliefs of a few meters high, with an elongated and hanging shape on the surrounding land, formed by the current and ancient Apennine courses following repeated episodes of flooding (embankment deposits, canal and route). It is a heavily man-made area where man, for over 3000 years, has exerted his action on the landscape both through artificial embankment and correction of waterways and reclamation of valleys, and through intense urbanization. Agriculture, in this portion of the territory, tends to become intensive where the slopes are reduced, developing on land contested by urban and industrial expansion. The environmental fragmentation caused by the high anthropization determines a significant vulnerability for these areas, mitigated by planning interventions such as the regional ecological network and conservation and restoration of green areas implemented at a municipal scale. These areas constitute the main economic but also cultural poles of the territory, connected by a road network that often develops parallel to the Apennine front (axis of the Via Emilia). However, there are also prestigious areas, in particular along the waterways (Crostolo, Modolena, Parma; Baganza, Rodano, Panaro, Secchia, Enza, Tiepido, Taro) which therefore constitute the main ecological corridors connecting the valleys of the hilly belt and plain wooded areas. To underline this, two core areas therefore insist on these prestigious environments, the core area of the River Taro and that of the Boschi di Carrega.

4.2. BE OF SIGNIFICANCE FOR BIOLOGICAL DIVERSITY CONSERVATION

Comparison of information about the number of species in Italy and the total for Europe (an indicator that is used to measure biological diversity, despite its limitations) clearly reveals that there is a good level of biodiversity in Italian territory, which is in keeping with the significant number of habitats, the variety in its geographical features and its latitudinal extent. This great biological diversity can also be found on a regional level (see sections 14.2).

In the territory of the reserve, at least 50 habitats of community interest have been recognised, including 14 priority sites and 6 of regional interest 2 hypogea.

Reserve area, there are at least 122 species of birds, amphibians, fish and invertebrates of community conservation interest, including 3 priority species (see enclosed the table of species and habitats). There are a number of species of priority interest: the Wolf, the Golden Eagle (which is on the national Red list of vulnerable species and the Emilia-Romagna Red list of endangered species) the Crested newt, the Spectacled salamander, the Fire salamander, the Common frog, a number of species of bats, the Hermit beetle (of priority interest). The Reserve's location on a climatic boundary means that there is great floristic biodiversity: there are at least 260 species of aquatic and terrestrial plants of community and regional conservation interest, including the ***Primula appenina***, which is notable for its endemism and priority status.

In the Biosphere Reserve area, it is possible to observe the Wolf (***Canis lupus***), a species classified as a (VU) D1 Vulnerable species in the IUCN Red List for Italy because there are estimated to be a maximum of 800 of the animals in the national territory, so the number of mature individuals is unquestionably well below the threshold for inclusion in the category, which is 1,000. Illegal killing, disjointed management by local institutions and interbreeding with dogs are all big threats to the species. This is the situation faced by the Nature Conservation Service of the National Park and the Life EXTRA Project, which are the flagship bodies for the management of problems associated with living alongside wolves not only in the Park area but also well beyond its administrative boundaries, as part of a management and study scheme at the cutting edge of the national scene. In Italy, the species has been legally protected and the focus of research since 1971. The Wolf is listed in Annexes II and IV of the Habitats Directive (92/43/EEC), CITES Appendix II and Appendix II of the Berne Convention (1979), in accordance with which it is prohibited to kill, trade or destroy the dens of wolves. Wolves were widespread in the territory of the Biosphere Reserve until the mid-19th century, but

- *Figure 4.3 - Pietra di Bismantova*

they were wiped out in the local area in the 1940s. In the early 1970s, wolves could only be found in a few, isolated areas of the Central and Southern Apennines, but since the 1980s the population has increased and the territory covered by the species has expanded.

Wolves can currently be found all along the Apennine ridge as far as the westernmost point of the Alps, so they are also present in the candidate area. The main factors behind their recovery have been natural regeneration of the mountain territory, legal protection of the species, the biological characteristics of the animals and a number of conservation and environmental protection measures.

There are stable packs of wolves in the Reserve area which have been monitored continuously since 1997 in a number of Life Natura projects. In order to build knowledge and develop suitable management tools, specific maps were produced of the areas that could be used to raise cubs, starting with acoustically detected rendezvous sites, as well as possible sites of predation in pastures.

In addition, in the Reserve territory a LIFE Natura project called "Monitoring and Conservation of Golden Eagles in Three Emilia-Romagna Regional Parks" ("Monitoraggio e Conservazione dell'Aquila reale in tre parchi regionali dell'Emilia Romagna") took place and subsequently in 2009 the National Park started a "Preliminary Study of Golden Eagles" ("Studio preliminare sull'Aquila reale") that was funded by the Ministry of the Environment and the Protection of the Territory and Sea and carried out by the Parma branch of LIPU (the Italian League for the Protection of Birds). The general objective of these schemes is to monitor the presence of Golden Eagles in the Apennines territory and in particular the take-off rates of the five nesting pairs in and around the protected area. The specific objectives are:

- to develop guidelines for the management of the species in the territory of Parks;
- to create a synergic effect between the staff of all of the Authorities with the species in their territories;
- to ensure that Park supervisory staff are suitably informed and exchange information;
- to raise awareness, actively involve and inform the local communities about the importance of safeguarding protected species;
- to promote "environmentally friendly" behaviour through precise information and educational campaigns for the users of protected areas.

In addition, work is still underway on the project LIFE08 NAT/IT/000369 GYPSUM (www.lifegypsum.it): protection and management of the habitats linked to the gypsum formations of the Emilia-Romagna region (2010-2015). It has involved numerous initiatives concentrated in a particularly valuable area of Triassic Gypsum Outcrops, with monitoring of habitats such as those of bryophytic flora and bats, analyses of the threats that are still present, and proposals for measures and actions to help manage the fragile ecosystems in the medium and long term. One of the tangible actions by the project is a natural rehabilitation scheme that is currently taking place for hydraulic and morphological restoration in the partially compromised habitat of the Sources of Poiano area (7210 *). The objective is to boost the biodiversity of the area, which was once much richer and has been significantly reduced by anthropic activity. Two species that had disappeared from the environment (Triglochin palustre and Carex davalliana) have been reintroduced in partnership with Veneto Agricoltura – the Plant and Non-Forest Biodiversity Centre of the Veneto Region.

Similarly, the LIFE EREMITA project, currently underway, aims to ensure the best conditions for the conservation of the residual populations of two species of saproxylic insects of priority conservation interest (*Osmoderma eremita* and *Rosalia alpina*) and of two species of lentic and lotic waters (*Graphoderus bilineatus* and *Coenagrion mercuriale castellanii*), acting on the threat factors of anthropogenic origin. The species *Graphoderus bilineatus* (or "Two-banded Dysticus") gives a lot of value to the Biosphere Reserve, representing a currently unique report throughout the Italian territory. Finally, among the amphibians, the presence of the Italian cave salamander (*Speleomantes italicus*) should be noted

The Central Emilia Parks are also involved in the management of the MONITRING Project as a partner of the National Ringing Centre (Centro Nazionale Inanellamento CNI) of the Higher Institute for Environmental Protection and Research (ISPRA) of the Ministry of the Environment and Land and Sea Protection.

RELEVANT EXPERIENCES OF CONSERVATION OF BIODIVERSITY, HABITATS AND LANDSCAPE UNITS

In a system that had few commercial contacts with the outside in history, plant varieties and animal breeds have been maintained in the area which elsewhere have been quickly replaced by varieties and breeds standardized to more productive farming and breeding systems. This rich heritage of agricultural biodiversity today represents an added value to local productions that feature the territorial identity and therefore that sustainable competitive advantage allowing to create positive economies even for small productions. The idea of creating a Germplasm Bank was born within a vast project called "Home Gardens" targeting the promotion of the spread of local cultivars, in order to maintain a high level of rural biodiversity and avoid the disappearance of know-how and knowledge on uses, cultivation methods, local culture linked to particular typical dishes, the treatment of diseases, knowledge and centuries-old traditions. The rural area has a substantially recent past in which agriculture, largely subsistence farming, was the main activity. Agricultural and zootechnical activity, from the valley to the highest altitudes of the Apennines, has shaped the rural landscape creating an extraordinary system in which the action of nature and the work of man have intertwined in a harmonious and non-destructive way. Certainly, the limited ability to produce relevant transformations has guaranteed this substantial balance.

THEREGIONAL SEED BANK

Regional law 64/2004 ratified the creation of:

- A Regional Seed Bank (art. 6) to protect genetic resources through ex situ conservation. The Seed Bank takes all necessary measures to protect the materials that it stores from all forms of contamination, alteration and destruction. The Bank collects all of the officially listed genetic resources.
- *Coltivatore Custode* (Cultivator Custodian) (art.9), farmers that ensure conservation, in the original collection areas, that is those areas that are considered their traditional locations of the officially listed endangered genetic resources.

The ***Coltivatore Custode*** ensure that individual genetic resources are secure by protecting and safeguarding them from all forms of contamination, alteration and destruction, while also raising awareness and spreading cultivation of the genetic resources under their care and replenishing the seeds of herbaceous species that are stored in the Regional Seed Bank. People can apply to participate in the scheme by joining a list kept by the relevant body of the Regional Council.

The Regional Register of Varieties for Conservation (art. 10), which is kept by the relevant body of the Regional Council. Varieties that are already officially listed and at risk of extinction can be included in the register at the request of private parties interested in relaunching their production.

In 2004, the Garfagnana Mountain Community - which was then transformed into the Garfagnana Union of Municipalities - launched the "Home Gardens" project to carry out widespread research into ancient vegetable and fruit varieties of agricultural interest that are still present in the area. Schools of all levels (from pre-schools to secondary schools) took part in the project in order to ensure that the research was conducted throughout the territory and the local people were involved. This led to widespread approval and the collection of seeds and reports of mother plants at the "La Piana" centre in Camporgiano, which is run by the Union of Municipalities. The varieties were reproduced in the centre and at the same time an identification and characterisation process was started in partnership with the universities of Pisa (for vegetable varieties) and Florence (for fruit varieties).

The crowning glory of the ***in situ*** conservation efforts for the ancient varieties came in 2008, with the founding of one of the branches of the Regional Seed Bank: a "place" where native genetic plant resources of agricultural and forestry interest are stored in the form of seeds or plants in order to protect them. The Seed Bank is a biological laboratory where measures are taken to safeguard the genetic materials stored from contamination, alteration and dispersion.

Dozens of ancient varieties of vegetables are stored at the "La Piana" Centre, along with a selection of more than 200 mother plants for fruits such as apples, pears, plums, cherries, figs and mulberries).

The characterisation work has enabled around 30 ancient varieties to be included in the Regional Register that the Region of Tuscany established with Regional Law 64/2004.

In 2009, an experimental vine field was also created at the Centre, with more than 2,000 plants of around 50 local ancient vine species. The genetic characterisation work done with the University of Pisa revealed that no fewer than 25 of the vine species are not present in any European databases, meaning that they are exclusive to the area.

The accurate, in-depth research has made it possible to preserve a high level of rural biodiversity and prevent the disappearance of the wealth of knowledge about customs, farming methods, local culture associated with distinctive dishes, curing illnesses, know-how and age-old traditions.

While the research was being conducted, a group of "***Coltivatori Custodi***" was selected from people who live in the territory. They cultivate and safeguard the cultivars under their care by replenishing their seed stocks of herbaceous species to reuse in the next sowing season and taking small quantities for storage in the local branch of the Seed Bank.

In Garfagnana, there are 35 ***Coltivatori Custodi***. They make up almost 30% of the cultivator custodians in the entire Region of Tuscany and this underlines the cultural significance of the sense of belonging and territorial identity that it has been possible to develop in

the Garfagnana area. Some of the varieties that have been salvaged and reproduced have entered local commercial circles, although only very low quantities are produced.

In the last year, the Garfagnana Union of Municipalities has launched another project called "***Ri-dare valore alla terra***" ("Restore the value of the earth"). It operates in areas that are well suited to the production of certain ancient varieties (especially beans and potatoes) in order to revitalise a number of aspects, including the landscape. Its aim is to highlight the many benefits of the ancient varieties, such as the positive impact on the landscape.

In addition to the premises of the Seed Bank, at the "La Piana" Centre in Camporgiano there are also research and communication facilities that regularly host activities associated with preservation of genetic materials.

STUDY OF THE POPULATIONS OF RARE AND/OR THREATENED PLANT SPECIES IN THE NORTHERN APENNINES

The rarity of plant species can be correlated with a range of factors, such as ties to singular habitats or distributive and geographical aspects. The taxa in question, or at least some local populations of them, can therefore easily be in danger of disappearing due to the natural dynamics of vegetation or the impact of humans. In part of the candidate area, a research project was carried out to assess the state of conservation of habitats and species and plan protection activities. The long-term monitoring programme highlighted a decrease in number and loss of vitality in the populations over time. From a methodological point of view, numerical estimates were made by counting the individuals of each species or – when this was not possible – examining parameters relating to the plants such as the percentage of the ground surface covered and the number of scapes with flowers or fruits. This was largely done in standard sample areas. The research project started in 1999 and ended in spring 2002. It took place in the Alto Appennino Reggiano Regional Park and its aim was to assess the conservation status of very limited populations of certain species that are considered to be rare locally, in order to obtain precise information about the risk of them disappearing locally.

15 species were covered:

- *Alopecurus gerardi* Vill.
- *Linum capitatum* Kit.
- *Juncus jacquinii* L. (Jacquin's rush)
- *Leucanthemopsis alpina* (L.) Heyw.
- *Lychnis alpina* L.
- *Salix herbacea* L. (dwarf willow)
- *Salix hastata* L. (halberd willow)
- *Salix breviserrata* Fold.
- *Rhododendron ferrugineum* L. (alpenrose)
- *Cerastium cerastioides* (L.) Britton (starwort chickweed)
- *Carex foetida* All.
- *Ranunculus küpferi* Greuter & Burdet
- *Senecio incanus* L.
- *Vicia cusnae* Foggi & Ricceri
- *Primula apennina* Widmer

They are high altitude plants that are rare in the local area. Many of them have connections with Central European or Arctic regions. Each species only grows in one place or just a few separate sites. This is partly because they tend to be rather dispersed near the edges of their ranges (this is often a sign of a climatic boundary) and partly due to the low altitude of the specific study area in the Reggio Emilia Apennines (approximately 2,000 metres above sea level), which probably means that the growing conditions are not ideal. Indeed, the majority of the species thrive in places where there is snow cover for extended periods. Frequent decreases in the periods of time with snow on the ground could cause serious damage to them.

The information about the plant species studied was gathered in several sample areas of the local populations. The areas of the sample sites were chosen in proportion with the sizes of the individual species and the local density and coverage, while the number of sites was based on the size of the local population. The sample sites were located randomly within the local ranges of each species. Data collected in the sample areas were used to assess the status of the plant populations and comparisons were made of data from different years. For ***Salix herbacea*** and ***Juncus jacquinii***, comparisons were also made with populations of the same taxa growing in Alpine environments.

The results of the research can be found in the Department of Territorial Ecology at the University of Pavia. The following points are worth noting in particular:

1. There is an ongoing presence of all of the species that were investigated because past botanical literature claimed that they were rare locally;

2. At the time of the study, Juncus jacquinii no longer appeared to be present in some locations where it was known to be found until 30 years ago;

3. New areas of growth on Monte Cusna and Alpe di Succiso were noted for some species (Salix hastata, Salix breviserrata and Linum capitatum;

4. The species studied were mapped using geographic information systems (GIS), thus providing an objective basis for future monitoring and research;

- *Figure 4.2 - Cirone Pass*

5. Given the small surface areas covered, it is possible to confirm the rarity of the species studied that were considered to be locally rare. However, at the time that the project ended, none of them could be deemed truly threatened;

6. Nonetheless, the health of the species is hindered by certain factors, especially trampling by tourists (Monte Prado) and overgrazing of some of the species studied (Monte Cusna and Monte Prado). The climate change that is underway also has an impact, especially because the annual duration of the local snow cover is tending to get shorter;

7. A study was carried out of the population and vitality of nine species. In particular, it was revealed that the populations studied had lower infructescence production than comparable Alpine populations, meaning that they had a low capacity to support themselves. The situation is worse in areas affected by anthropic disturbance. Unlike in the Alps, the local populations are isolated relicts. They live in ecological circumstances that are unsuitable or at the very least not optimum. Their survival so far is thanks in part to the good vegetative reproduction typical of high altitude species.

The seeds of some of the species studied have been sent to "The Millennium Seed Bank Project" at Kew Gardens in Great Britain as part of an agreement between Kew Gardens and the Regional Park. This will act as a form of preventive protection for these species if they disappear locally. The project enables viable seeds to be stored for at least 100 years and they can be used in the event of disappearance. In the final years of the project, a reintroduction scheme was set up for one species (Juncus jacquinii) in areas where it had recently disappeared.

4.3. PROVIDE AN OPPORTUNITY TO EXPLORE AND DEMONSTRATE APPROACHES TO SUSTAINABLE DEVELOPMENT ON A REGIONAL SCALE

The Biosphere Reserve candidature presents the local community with an important opportunity to continue and boost the renewal process which has already been underway for several years, influencing all of the parties involved in their relations and the systems that they use to achieve shared social and development goals. This portion of the Apennine ridge has complex, dynamic natural systems that perform very significant economic, residential, transportation and recreational functions. In the Tuscan-Emilian Apennines agriculture allowed (since it is largely managed in a traditional, extensive manner) to preserve a great deal of in the landscape units and the cultivated biodiversity. Recently, a tourism economy has developed. It is mainly based on the environmental quality of the territory and the appeal and quality of the typical agricultural output and foods produced. The Appennino Tosco-Emiliano Reserve is inherently suited to becoming a genuine "sustainable development laboratory" that can combine the duty to preserve the ecological values of the territory with making the most of its specific qualities and traditional, environmentally friendly activities.

In the last ten years, the portion of the Apennine ridge part of the Biosphere reserve, as well as the part that has been nominated for extension worked to become a sustainable development laboratory in several sectors,

and is now a benchmark for the entire Apennine ridge and Italian mountainous areas in general that have remained on the sidelines of industrial development and mass tourism. Its positive status in this respect is down to a number of factors, but there is no doubt that a central role has been played by the efforts of the Appennino Tosco-Emiliano National Park and the Bodies for the Management of Parks and Biodiversity of Central Emilia and West Emilia in conjunction with local and regional authorities, the network of neighbouring protected areas and a wide range of partners, using memoranda of understanding to involve the majority of local stakeholders (Local Action Groups, Chambers of Commerce, Trade Associations and Environmentalist Associations). Together, they have launched a number of pilot schemes which have gone on to establish best practices in the spheres of sustainable tourism, quality agriculture, environmental education, strengthening the local identity, and action to combat the effects of internationalisation and globalisation.

The winning element of the proposed tourism model lies precisely in the fact that it does not require infrastructure other than the territory and the human resources available to present it and make it known to visitors. Also for this reason this model is extremely replicable and there have been many similar projects born in other territories both in the Apennines and in the Alps. To crown this territorial commitment to sustainable tourism, the Appennino Tosco-Emiliano National Park obtained in 2014 the designation of the European Charter for Sustainable Tourism (ECST) in protected areas issued by Europarc, the ECST designation was renewed in September 2019. The ECST designation was also obtained by the Body for the Management of Parks and Biodiversity of Central Emilia in 2019

The close ties between tourism and agriculture in the territory are underlined since 2008 by the "Menu' a km zero" competition that in 2018 has become the "UPVIVIUM – Biosfera Gastronomica a Km Zero", organized together with 4 Italian Biosphere Reserves (Sila, Alpi Ledrensi e Judicaria, Delta del Po, Isole di Toscana): a culinary contest involving restaurants and agro-food producers of the territories to support and consolidate the strong collaboration among the actors. UPVIVIUM is based on the strong collaboration with ALMA (international school of Italian cuisine) and it involves at present four Italian Biosphere Reserves (Alpi Ledrensi e Judicaria, Sila, Delta del Po, Isole di Toscana). For more information see chapter 15.2.1 of this dossier.

The Atelier delle Acque e delle Energie (Atelier of Water and Energy) promoted by the Appennino Tosco-Emiliano National Park, in collaboration with the Municipality of Ventasso, ENEL and Reggio Children (the holder of the renowned Reggio Approach, an intagible Made in Italy asset) is organized as an indoor and outdoor workshop in the National Park territory. It is based in the Ligonchio hydroelectric power plant: experiences and exploration to creatively develop knowledge on water and environment. For details see chapter 16.1.3.

The parks of Central Emilia have also started the project "Innovazione tecnologica e sequestro del carbonio nella gestione dei demani forestali dell'Alto Appennino modenese" (Technological innovation and carbon sequestration in the management of the forest domains of the Modena High Apennines), with funds from the RDP and by activating a G.O.I (innovation operational group)

None of these projects should be deemed finished and complete. They all require development, innovation and reinforcement. The sharing of similar experiences in the international network of Biosphere Reserves would certainly help them in this respect.

4.4. HAVE AN APPROPRIATE SIZE TO SERVE THE THREE FUNCTIONS OF BIOSPHERE RESERVES

The proposed Biosphere Reserve area covers 498,613 hectares, 4% of which are Core Areas, 10% Buffer Zones and 86% Transition Areas. The area covers the Tuscan-Emilian Apennine ridge from Monte Grotta Mora near Passo della Cisa and the springs of the Dardagna river, to the Corno alle Scale slops, that is the part of the ridge marking the geographical and climatic boundary between Continental Europe and Mediterranean Europe.

The area covers 80 Municipalities that have always been traditionally associated with the Tuscan-Emilian Apennines, listed below by province, in bold in case of Municipalities which were not part of the previous Biosphere Reserve. Provinces of Reggio Emilia (Albinea, Baiso, Canossa, Carpineti, Casina, Castellarano, Castelnovo ne' Monti, Quattro Castella, Reggio Emilia, Toano, Ventasso, Vetto, Vezzano sul Crostolo, Viano, Villa Minozzo), Parma (Berceto, Calestano, Collecchio, Corniglio, Felino, Fornovo di Taro, Langhirano, Lesignano de' Bagni, Medesano, Monchio delle Corti, Neviano degli Arduini, Noceto, Palanzano, Parma, Sala Baganza, Terenzo, Tizzano Val Parma), Modena (Castelvetro di Modena, Fanano, Fiorano Modenese, Fiumalbo, Frassinoro, Guiglia, Lama Mocogno, Maranello, Marano sul Panaro, Montecreto, Montefiorino, Montese, Palagano, Pavullo nel Frignano, Pievepelago, Polinago, Prignano sulla Secchia, Riolunato, Sassuolo, Serramazzoni, Sestola, Zocca), Massa-Carrara (Aulla, Bagnone, Casola in Lunigiana, Comano, Filattiera, Fivizzano, Fosdinovo, Licciana Nardi, Mulazzo, Podenzana, Pontremoli, Tresana, Villafranca in Lunigiana, Zeri), Lucca (Barga, Castelnuovo Garfagnana, Castiglione di Garfagnana, Coreglia Antelminelli, Fosciandora, Minucciano, Piazza al Serchio, Pieve Fosciana, San Romano in Garfagnana, Sillano Giuncugnano, Villa Collemandina), and La Spezia (Luni).

The area naturally stretches further into Emilia than into Tuscany due to the different shapes of the land on the two sides. In Tuscany to the South, the Apennines have steep slopes reaching down to the Tyrrhenian and Ligurian Seas due to fluvial incision and structural geological contact with clearly distinct units such as the Apuan Alps. In Emilia to the North, the ridge slopes gently down towards the Po Valley. Consequently, there is a large area that has strong ecological, cultural and socio-economic links with the ridge (see Fig. 7.1)

Figure 4.6 – Poiano springs

4.5. THROUGH APPROPRIATE ZONATION

(A) A LEGALLY CONSTITUTED CORE AREA OR AREAS DEVOTED TO LONG TERM PROTECTION, ACCORDING TO THE CONSERVATION OBJECTIVES OF THE BIOSPHERE RESERVE, AND OF SUFFICIENT SIZE TO MEET THESE OBJECTIVES

The pillar of the Biosphere Reserve is the area's distinctive status as a "ridge" territory. It is a place of union/division and therefore equilibrium and exchanges between climates, ecosystems, cultures and economies. With its rich, varied mosaic of diversity and peculiarities concentrated in just a "few" hectares, it is truly unique. The main Apennine ridge which divides Emilia from Tuscany is a Euro-Mediterranean climatic boundary and it is the common factor that links the excellent qualities of the vast territory (represented by the Transition Areas) between the Po Valley and the Tyrrhenian Sea.

For this reason, 6 of the 14 Core Areas are traced along the main ridge dividing the Emilia-Romagna and Tuscany regions:

1. Monte Sillara 2,168 hectares
2. Alpe di Succiso 1,965 hectares
3. Cima Belfiore 958 hectares
4. Monte Cusna 4,474 hectares
5. Monte Giovo 3,437 hectares
6. Monte Cimone 3,198 hectares

These Core areas run all along the ridge and are only broken by the presence of facilities witnessing the pressure of human activities that could jeopardize the ecosystem's continuity.

The other Core Areas show the importance of the natural environment and landscape on the secondary North-South ridges, which are perpendicular to the Apennine ridge and can only be found on the northern side:

7. Prinzera 189 hectares
8. Monte Caio 354 hectares
9. Monte Ventasso 368 hectares
10. Pietra di Bismantova 71 hectares
11. Sassi di Roccamalatina 71 hectares

Core Areas of important conservation relevance have been identified in those parts of the reserve that are close to the plain areas:

12. Fiume Taro 873 hectares
13. Boschi di Caregga 876 hectares
14. Rupe di Campotrera 42 hectares

The Core Area of Monte Ventasso, Monte Caio, Monte Prinzera and that of Pietra di Bismantova, were also chosen by virtue of their symbolic value in the cultural and social development of the territory and for the relationship that surrounds them between man and biosphere especially in the field of mountain agriculture and wildlife tourism. Similarly, the route that connects the Core Areas of "Monte Cimone" and "Sassi di Roccamalatina" is an example of the mosaic of ecosystems and relationships between resident populations and their territory that develops along the axis of the Panaro River.

- *Figure 4.5 - Sassi di Roccamalatina*

All the Core Areas fall within areas already subject to significant degrees of protection, such as those of the State Integral Reserves, the National Park, the Emilia Regional Parks, the Regional Reserves, SCIs and SPAs (Natura 2000 Network), the Galasso law partly transposed in the Urbani decree as amended, of the provincial PTCP.

(B) A BUFFER ZONE OR ZONES CLEARLY IDENTIFIED AND SURROUNDING OR CONTIGUOUS TO THE CORE AREA OR AREAS, WHERE ONLY ACTIVITIES COMPATIBLE WITH THE CONSERVATION OBJECTIVES CAN TAKE PLACE

A big Buffer Zone of 40,281 hectares surrounds the 8 Core Areas next to the ridge, , acting not only as a "protective cushion" but also as a wildlife corridor between them. Other Buffer Areas surround the Core Areas at lower altitudes, with forms of protection consistent with the conservation strategy of the Biosphere Reserve. The Buffer Areas have been conceived by identifying mostly areas already subject to degrees of protection such as those of the National Park, of the Emilian Regional parks, of SCIs and SPAs, of the Galasso law partly transposed the Urbani decree as amended, of the provincial PTCP, of the PTPR (art.19) of the Emilia Romagna Region

Buffer areas are generally very large. Exceptions are some portions along steep slopes which, in fact, naturally isolate the Core Areas making them not easily accessible and protected from the surrounding context. The sections affected by transitions of administrative boundaries or regulatory constraints that are in some way unfavourable to the definition of larger core areas are also an exception. In these cases, it was decided to create minimal corridors by subtracting part of the surface of the corresponding Core Area, even where there were no specific physiographic elements, in some way protective and therefore supporting.

(C) AN OUTER TRANSITION AREA WHERE SUSTAINABLE RESOURCE MANAGEMENT PRACTICES ARE PROMOTED AND DEVELOPED

The aim when mapping out the Transition Area (43,0993 hectares) was to include the territories that have environmental, social and economic relationships with the Euro-Mediterranean Tuscan-Emilian Apennine Ridge, which lies between Passo della Cisa and Passo dei Tre Termini (or "Passo della Calanca", separating the province of Pistoia from Modena and Bologna). Partly because of the depopulation and ageing processes in the upper ridge Municipalities, the Transition Area was extended towards the valleys to show the desire to involve the human resources of the Apennines in the protection of the territory's distinctive features, first and foremost by encouraging and advocating understanding of the area and then by upgrading it through sustainable socio-economic development. Consequently, the Transition Areas include urban settlements (with services such as schools, commercial businesses and hospitals), manufacturing and tourist areas, and above all large agricultural and rural areas; transition areas are therefore the best places to test and spread a sustainable development model that supports, protects and promotes the Core Areas and Buffer Zones.

(D) PLEASE PROVIDE SOME ADDITIONAL INFORMATION ABOUT THE INTERACTION BETWEEN THE THREE AREAS

The possible interactions between the different areas of the Reserve are intrinsically motivated by some concepts linked to the physical characteristics of the places: relative proximity among the parties, visual perception of the different components from different observation points, easy perception of the main landscape elements and variations, presence of ridges valleys and river cuts that facilitate the crossing of the Reserve, a dense network of paths connected to the ordinary road system and to the supra-regional path network. The area of the Reserve easily allows an exchange, in addition to human capital, of matter and energy between the ecosystems present in it. In fact, the physical and anthropogenic barriers that could prevent the interactions among the three different areas

Figure 4.7 - Alpe di Succiso

THE 10 FOUNDING PRINCIPLES OF THE ECST ARE:

1. Working in Partnership. to involve all those implicated by tourism in and around the protected area in its development and management

2. Preparing a strategy: to prepare and implement a sustainable tourism strategy and action plan for the protected area with the commitment of all stakeholders involved

3. To protect and enhance the area's natural and cultural heritage: to protect resources from an irresponsible and high impact tourism

4. Quality: to provide all visitors with a high quality experience in all aspects of their visit

5. Communication: to communicate effectively to visitors about the special qualities of the area

6. Specific local tourism products: to encourage tourism linked to specific products, which enable discovery and understanding of the area

7. Improve knowledge, training: to increase knowledge of the protected area and sustainability issues amongst all those involved in the tourism industry

8. Quality of life of residents: to ensure that tourism supports and does not reduce the quality of life of local residents

9. Benefits for the economy: to increase benefits from tourism to the local economy

10. Monitoring flow, reducing impact: to monitor and influence visitor flows to reduce negative impact.

(core, buffer and transition) are almost absent. Only the physiographic articulation of the places makes crossing and connections challenging, but if this may represent an apparent limitation for external visitors, it is not for the locals who for thousands of years have been accustomed to crossing places, even along difficult to find roads (pastoral transhumance). Finally, it should be considered, albeit with due distinctions, that the area made up of the various sectors of the Reserve still enjoys some common identity and vocational factors: for example, the implications deriving from the farming and sheep farming locally, such as those deriving from agriculture and other active exchanges between the coastal areas and the Apuan Alps to the south, and the plain areas along the Via Emilia and the Po river to the north.

4.6. ORGANIZATIONAL ARRANGEMENTS SHOULD BE PROVIDED FOR THE INVOLVEMENT AND PARTICIPATION OF A SUITABLE RANGE OF INTER ALIA PUBLIC AUTHORITIES, LOCAL COMMUNITIES AND PRIVATE INTERESTS IN THE DESIGN AND THE CARRYING OUT OF THE FUNCTIONS OF A BIOSPHERE RESERVE

DESCRIBE ARRANGEMENTS IN PLACE OR FORESEEN

The Appennino Tosco-Emiliano National Park promoted the application that led to the designation of the territory as a Biosphere Reserve by the UNESCO Office in Paris, on 9 June 2015. Between 2009 and around 2014, the Body has managed an intense process of consultation, participation and involvement of the local community and all stakeholders, with the aim of identifying missions, objectives and future management strategies of the territory; it has also promoted important information and awareness actions on the topic of the UNESCO MaB International Network. The description of these actions is included in the application dossier, attached.

During the Biosphere Reserve application phase, official demonstrations of support were collected, in the form of endorsement letters and resolutions, by Local Bodies and important stakeholders in the territory that have committed not only as signatories but also as active participants in the management of the Reserve according to the governance model identified

The same approach used during the application phase was re-proposed for the extension of the Biosphere Reserve. The actions carried out in the area, following the designation, led to the reception of numerous requests for the inclusion of Local Authorities between the spring of 2016 and the spring of 2020; these are 45 municipalities distributed in the provinces of Reggio Emilia (Albinea, Castellarano, Quattro Castella, Reggio Emilia, Viano), Parma (Collecchio, Felino, Fornovo di Taro, Medesano, Noceto, Parma, Sala Baganza, Terenzo), Modena (Castelvetro di Modena, Fanano, Fiorano Modenese, Fiumalbo, Guiglia, Lama Mocogno, Maranello, Marano sul Panaro, Montecreto, Montefiorino, Montese, Palagano, Pievepelago, Polinago, Prignano sulla Secchia, Riolunato, Sassuolo,

Serramazzoni, Sestola, Zocca), Massa Carrara (Aulla, Mulazzo, Podenzana, Pontremoli, Tresana, Zeri), Lucca (Barga, Castiglione di Garfagnana, Coreglia Antelminelli, Fosciandora, Minucciano), La Spezia (Luni).

Also in the areas subject to the Reserve extension, tools have already been developed such as Management Plans for the SCIs and SPAs sites, the Rural Development Plans of the Emilia-Romagna and Tuscany Regions (period 2014-2020) and the Territorial Plans for Coordination and Landscape Protection in force. The agreement that the Body for the Management of the Biosphere Reserve has entered into with the management body for Parks and Biodiversity of Central Emilia (Central Emilia macro area) is also of considerable interest: this agreement will allow in particular to that large part of Modena area (as many as 21 municipalities) which requested to join to better fit in the governance and development perspective promoted by the Reserve.

- *Figure 4.8 – Lagastrello pass*

HAVE ANY CULTURAL AND SOCIAL IMPACT ASSESSMENTS BEEN CONDUCTED, OR SIMILAR TOOLS AND GUIDELINES BEEN USED?

As in the application dossier (2014/15) it was specified that a specific assessment of the social and cultural impacts of the Reserve could not be carried out before its establishment, now, while recognizing the effects from the aggregative and motivational point of view and while experiencing economies derived from the path taken, the same is true for the extension. However, evaluations, critical observations, and corrective proposals on the lines currently proposed for the Biosphere Reserve have been systematically acquired during the drafting of the Plan for the Appennino Tosco-Emiliano National Park and the drafting of the Plans for the Regional Parks of Macro areas of Central Emilia (Parco del Frignano, Sassi di Rocca Malatina Park) and West Emilia (Parco Fluviale del Taro, Parco dei Boschi di Carrega, Parco dei Cento Laghi), and in different forms also for other planning tools, such as the Management Plans of the SCI and SPA areas and more generally the territorial and landscape plans already drawn up by the regions and provinces. Interactive studies and consultations with economic categories of agriculture and tourism were conducted in preparation of the Rural Development Plans (RDP) for the period 2014-2020 and for the period 2021-2027.

4.7. MECHANISMS FOR IMPLEMENTATION

DOES THE PROPOSED BIOSPHERE RESERVE HAVE

"(A) MECHANISMS TO MANAGE HUMAN USE AND ACTIVITIES IN THE BUFFER ZONE OR ZONES"?

The buffer zones of the Biosphere Reserve include areas that are already subject to degrees of protection offered by the National Park, the Emilia-Romagna Regional Parks, the Network of Natura 2000 Sites (Siti Rete Natura) and landscape protection.

In the Buffer zones there are some towns that, due to their unique geographical situation, house valuable biodiversity and represent the starting point for undertaking functions relating to development, which will be completed in the Transition areas.

The existing plans for managing land use and anthropic activity ensure a good level of current and future protection for the Biosphere Reserve through the implementation of the Code of Cultural Heritage and Landscape (Codice dei Beni Culturali e del Paesaggio), the current Guidelines for the Protection of the National Park and Regional Parks (Disciplina di Tutela del Parco Nazionale e dei Parchi Regionali), as well as the Territorial Plan, the Regulations and the multiannual social and economic Plan, and the Management Plans and Conservation Measures for the Network of Natura 2000 Sites.

With the designation of the Biosphere Reserve, the protection status, has obtained a higher level of coordination and will continue to be aimed at a consistency of objectives and actions identified in the governance system and in the Management and Development Program. In this perspective, it should be added that significant operational indications are now present at various local to national government levels, consistent with the objectives of the Reserve (municipal territorial planning for construction and land use, regional

indications for the installation of renewable energy systems, rules contained in the General and forest police requirements for agro-forestry-pastoral use.

"(B) A MANAGEMENT POLICY OR PLAN FOR THE AREA AS A BIOSPHERE RESERVE"?

During the application phase to the Biosphere Reserve, the foundations were laid for the establishment of a Management Program aimed at outlining operational programs for the protection and conservation, monitoring and research, support for sustainable development, education for sustainability and professional training with respect to the values and excellence of the territory. A detailed description of the actions implemented can be found in the 2014 application dossier (attached).

With regard to all the actions implemented by the Reserve Management Committee for the definition of a management plan and to understand how these actions are placed with respect to the expansion objective of the Reserve itself, please refer to chapter 17 of this Dossier.

A relevant event, for the definition of a plan and more generally of a sustainable tourism management strategy within the Reserve, was the achievement in 2014 of the ECST (European Charter of Sustainable Tourism in Protected Areas) by the Appenino Tosco-Emiliano National Park (currently in the verification phase to obtain the 1st renewal). In this way, the following Municipalities of the National Park are currently involved in the ECST: Corniglio, Monchio delle Corti (PR), Castelnuovo ne' Monti, Ventasso, Villa Minozzo (RE), Bagnone, Comano, Filattiera, Fivizzano, Licciana Nardi (MS), San Romano in Garfagnana, Sillano Giuncugnano and Villa Collemandina (LU).

The founding principles of the ECST (see box) are perfectly aligned with the objectives of the MaB Reserve; for this reason, the procedure launched by the National Park in April 2013, which was carried out through numerous information meetings both on the Tuscan and on the Emilian side, immediately involved also the tour operators who carry out their activities even outside the territorial area of the Parks. The evaluator appointed by the Europarc Federation to verify the participation of the territory in the process of obtaining the ECST carried out an audit in May 2014; the final report was then examined by the Evaluation Committee, which recognized the certification in the first instance to the National Park. The evaluator was recently able (first months of 2019) to deepen and evaluate this approach according to the 1st renewal expected for September 2019). As part of the ECST, also the Management Bodies of Park and the West Emilia and Central Emilia Biodiversity launched their participatory process in April 2019 towards the candidacy for the territories of the Parchi del Ducato e dei Parchi dell'Emilia Centrale (Parks of the Duchy and the Parks of Central Emilia). In this context, the management and development tool of the Protected Areas could expand in the future the number of interested Municipalities of the Biosphere Reserve including Baiso, Canossa, Casina, Vetto, Vezzano sul Crostolo, Viano (RE), Fanano, Fiumalbo, Frassinoro, Guiglia, Lama Mocogno, Marano sul Panaro, Montecreto, Montefiorino, Montese, Palagano, Pievepelago, Riolunato, Sestola, Zocca (MO). Also important on the same issues is the participation of the National Park Authority and the Management Body of Parks

and Central Emilia Biodiversity in the INTERREG CEETO project (please refer to Chapter 15.2.3 for more information).

The Biosphere Reserve also includes numerous municipalities (Albinea, Baiso, Berceto, Calestano, Canossa, Carpineti, Casina, Castellarano, Castelnovo ne 'Monti, Castelvetro di Modena, Collecchio, Corniglio, Felino, Fiorano Modenese, Fornovo di Taro, Frassinoro, Guiglia , Langhirano, Lesignano de 'Bagni, Luni, Maranello, Marano sul Panaro, Medesano, Monchio delle Corti, Neviano degli Arduini, Noceto, Palanzano, Parma, Quattro Castella, Reggio nell'Emilia, Sala Baganza, Sassuolo, Tizzano Val di Parma, Vetto, Viano, Ventasso, Vezzano sul Crostolo, Toano and Zocca) and the entire Union of Municipalities of Frignano and the Reggiano Apennines that have joined the " Covenant of Mayor", with the drafting of Sustainable Energy and Climate Action Plan (SECAP. This membership is considered by the European institutions as an exceptional multi-level governance model, in the implementation of policies in the field of sustainable energy. The pact bases its action on support networks operating at various levels - economic, administrative, scientific, promotional - such as the Pact Coordinators, the Supporters of the Pact, the Office (CoMO) and the Joint Research Center (JRC) of the European Commission; a method that, similarly to what happens for the Biosphere Reserve, uses and systematizes the best skills available for each sector of interest to obtain effective results.

The members undertake to involve their citizens and stakeholders, as well as to spread the message of the Pact, also by encouraging other local administrations to join the initiative: this approach aimed at involving and disseminating good practices, specifically in the energy field, can be further strengthened within the MaB Reserve, where the network of relationships already in place will act as a means of amplifying the message even among the entities not involved in the Pact to date.

"(C) A DESIGNATED AUTHORITY OR MECHANISM TO IMPLEMENT THIS POLICY OR PLAN"?

The Appennino Tosco-Emiliano National Park is the body intended to perform the functions of Coordination and Secretariat of the Biosphere Reserve, which support the "Management Committee" and the "Permanent Consultative Assembly which are the main decision-making bodies for all matters regarding the management of the Reserve including definition, approval, implementation and monitoring of the Management Programme.

The Chairperson of the Appennino Tosco-Emiliano National Park holds the legal and administrative responsibilities for the nomination and for the preparation of reports to be sent to the relevant ministerial offices of the national MaB Committee and the UNESCO offices in Paris, from nomination and for at least the first ten years of its implementation. The official headquarters is that of the Appennino Tosco-Emiliano National Park in via Comunale 23a Sassalbo di Fivizzano (Massa-Carrara), Italy.

"(D) PROGRAMMES FOR RESEARCH, MONITORING, EDUCATION AND TRAINING"?

In the Biosphere Reserve territory, particularly the Appennino Tosco-Emiliano National park and the Regional Parks of Emilia (Bodies for Parks and Biodiversity of Central and West Emilia) have undertaken , and are currently undertaking a number of studies and research projects, as well as contributions from thesis and Doctoral degrees, which focus on deepening the environmental, socio-economic and educational aspects of the respective territories.

The Appennino Tosco-Emiliano National Park has participated in European and transnational projects. The LIFE Projects are a major part of this, structured so as to include both research and monitoring before and after implementation, as well as long-term education and training. Some important projects already concluded or underway are: LIFE09/ENV/IT//000188 ECO-CLUSTER, LIFE08 NAT/IT/000369 GYPSUM, LIFE14NAT/IT/001129 BARBIE, LIFE 13 NAT IT 728 MIRCO – Lupo; many LIFE projects have been carried out by the National Park (or started by regional parks and then conveyed to the National Park) in cooperation with Regione Emilia-Romagna and the Bodies for Parks and Biodiversity of Central and West Emilia.

An excellent educational, training and research project was designed by the Reggio Children Non-profit Foundation (Fondazione no profit Reggio Children) at the Atelier of Water and Energy (Atelier dell'Acqua e dell'Energia) within the hydroelectric power plant of Ligonchio (Reggio Emilia). Here, an annual SUMMER SCHOOL is organised with Italian and international participants to ensure that the innovative practices of Reggio Children and its educational approach, which is recognised and respected on an international level, remain dynamic and fruitful; adding value to the global network of Biosphere Reserves. the Reggio Children Foundation has endorsed the Reserve nomination and now offers its know-how and promotes active links with teachers and institutions in various countries across the continent. The National Park carries out also environment teaching activity working with the schools of the territory (Progetto Neve Natura, Scuola di Montagna e di Appennino, Autunno d'Appennino).

Each year, valuable training and refresher courses (2-3 days) are also organised for the teachers and heads of schools of all year groups that are based throughout the area nominated to become a Reserve; every year a theme to explore is chosen and the trainers continue to be figures of considerable cultural importance.

In the Emilia area, since 2018, every year, the project "School of the Mountain Parmigiano Reggiano Landscape" has been proposed, a cultural project with initiatives ranging from technical-scientific to artistic, from educational to popular with a view to growing widespread awareness of the landscape in which this cheese is produced and of its value. The project, with a rich partnership, involves several Municipalities of the Reserve, the Park Authorities, Unions, the Consortium of Parmigiano Reggiano, Istituto Cervi-Emilio Sereni Library.

The Mountain Union of Municipalities of the Reggiano Apennines, 8 Municipalities all included in the MaB Reserve, was chosen by the Emilia Romagna Region in 2020 for the establishment of a Local Landscape Observatory and various cultural activities and initiatives are underway to involve the population and young people. They are aimed at making people grasp the meaning, value and diversity of the Landscape.

Major environmental monitoring programmes have been carried out and are underway in the Reserve area by ARPA Emilia-Romagna and ARPA Tuscany (Regional Environment Agencies), the most significant of which are highlighted below:

GLORIA project (GLobal Observation Research Initiative in Alpine environments) together with the Pavia and Parma Universities.

Networks for monitoring inland surface waters, rivers, lakes and transitional waters: the quality of water bodies will be monitored through the implementation of the Water Framework Directive (2000/60/CE); observation takes place over three years. The objectives set by the European Union include: to prevent quantitative and qualitative degradation and to ensure the water quality is "good" by 31st December 2015.

Network for monitoring air quality: air quality is monitored through the implementation of Directives 22008/50/CE and 2004/107/CE; within the Biosphere Reserve, specifically in Torrechiara (Langhirano) and Febbio (Villa Minozzo), there are currently two fixed sampling sites in rural areas.

European Project CC-Ware: its objective is the mitigation of the quantitative and qualitative vulnerability of water resources in relation to climate change and socio-economic changes together with Arpa Emilia-Romagna.

Biomonitoring project of the ARPA Emilia-Romagna agency network – APAT (Agency for Environmental Protection and Technical Services) "Mosses as bio-accumulators" (2006).

The INTERREG CEETO (Central Europe Eco-Tourism) project which carries out monitoring activities on tourist and anthropogenic frequentation in a more general sense, in the areas considered to be the most delicate from an environmental point of view of the Parks falling within the Reserve (Appennino Tosco-Emiliano National Park and Regional Parks of Central Emilia

The Parks of Central Emilia are also undergoing EMAS III registration.

The Municipality of Reggio Emilia is involved in various projects, among which the following are mentioned: "Prospera - INTERREG (2019-2023)", a cooperation project aimed at exchanging good practices on the protection of natural heritage in peri-urban areas against risks of excessive urbanization; a project to enhance the ecological river corridors for cycle-pedestrian use, both for tourism and to encourage sustainable travel and integrated forestry action for the creation of urban forests.

5. ENDORSEMENTS

5.1. SIGNED BY THE AUTHORITY/AUTHORITIES IN CHARGE OF THE MANAGEMENT OF THE CORE AREA(S):

5.2. SIGNED BY THE AUTHORITY/AUTHORITIES IN CHARGE OF THE MANAGEMENT OF THE BUFFER ZONE(S):

5.3. SIGNED AS APPROPRIATE BY THE NATIONAL (OR STATE OR PROVINCIAL) ADMINISTRATION RESPONSIBLE FOR THE MANAGEMENT OF THE CORE AREA(S) AND THE BUFFER ZONE(S)

5.4. SIGNED BY THE AUTHORITY/AUTHORITIES, ELECTED LOCAL GOVERNMENT RECOGNIZED AUTHORITY OR SPOKESPERSON REPRESENTATIVE OF THE COMMUNITIES LOCATED IN THE TRANSITION AREA(S).

5.5. SIGNED ON BEHALF OF THE MAB NATIONAL COMMITTEE OR FOCAL POINT:


Noceto
PARMA
Medesano
Collecchio
Sala Baganza
Felino
Fornovo di Taro
REGGIO NELL'EMILIA
MODENA
Lesignano De' Bagni
Quattro Castella
Albinea
Langhirano
Canossa
Vezzano sul Crostolo
SASSUOLO
FIORANO
Viano
Castellarano
Maranello
Casina
Berceto
Castelvetro di Modena
Borgo Val di Taro
Carpineti
Marano sul Panaro
Castelnuovo Ne' Monti
Serramazzoni
Guiglia
Pontremoli
Villa Minozzo
Zocca
Pavullo nel Frignano
Lama Mocogno
Villafranca in Lunigiana
Montese
Fivizzano
Sestola
Aulla
Fanano
Piazza al Serchio
Pieve Fosciana
LA SPEZIA
Barga
Luni
CARRARA
MASSA
0
10
20 km
City
Town
Township

United Nations
Educational, Scientific and
Cultural Organization

Man and
the Biosphere
Programme

EXTENSION DOSSIER

APPENNINO TOSCO-EMILIANO

A MOSAIC OF DIVERSITY ACROSS THE APENNINIC CREST, A BORDER BETWEEN EUROPEAN AND MEDITERRANEAN CLIMATE

PART 2

6. LOCATION (COORDINATES AND MAP(S))

6.1. PROVIDE THE BIOSPHERE RESERVE'S STANDARD GEOGRAPHICAL COORDINATES (ALL PROJECTED UNDER WGS 84)

Cardinal points	**Latitude**	**Longitude**
Most central point:	44,383351°	10,3378°
Northernmost point:	44,731178°	10,205512°
Southernmost point:	44,09027°	10,458213°
Westernmost point:	44,400859°	9,752882°
Easternmost point:	44,406901°	11,049558°

6.2. PROVIDE A MAP(S) ON A TOPOGRAPHIC LAYER OF THE PRECISE LOCATION AND DELIMITATION OF THE THREE ZONES OF THE BIOSPHERE RESERVE

See annex 1

7. AREA (SEE MAP)

	Total (Biosphere Reserve 2014/15)	Terrestrial (extension proposal)	**Total**
Area of Core Area(s):	10,110 ha	+8,934 ha	**19,044 ha**
Area of Buffer Zone(s):	25,706 ha	+22,870 ha	**48,576 ha**
Area of Transition Area:	187,413 ha	+243,580 ha	**430,993 ha**
TOTAL	**223,229 ha**	**+275,384 ha**	**498,613 ha**

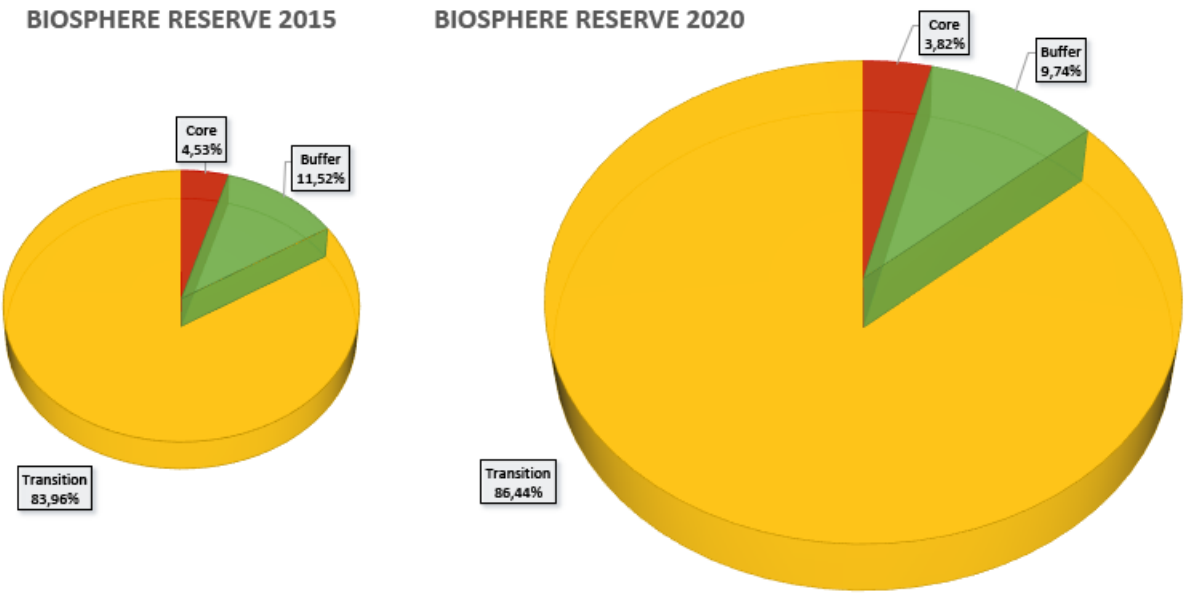
7.1. BRIEF RATIONALE OF THIS ZONATION IN TERMS OF THE RESPECTIVE FUNCTIONS OF THE BIOSPHERE RESERVE

The Biosphere Reserve has been outlined for its special feature of being the Apennine ridge in which the climatic and geographical boundary between Continental and Mediterranean Europe is situated, a line of union/division and thus of equilibrium and exchange between climates, ecosystems, cultures and economies: with its rich, varied mosaic of diversity and peculiarities concentrated in just a "few" hectares, it is truly unique. The ridge is a Euro-Mediterranean climatic boundary and is the lowest common denominator that links the excellent qualities of the vast territory (represented by the Transition Areas) between the Po Valley and the Tyrrhenian and Ligurian Sea.

The geographical boundary is delineated by a ridge studded with peaks, most of which are over 1800 m, which emerged during the Apennine orogeny in which lands, which were previously considerably further apart, were stacked up (see also chapter 11.4). The difference in the lithology of the two sides of the ridge has resulted in different acclivities and a significant variation in the soils which, together with a different slope exposure and a different use by Man, has given rise to the complex mosaic of habitats mentioned in the previous paragraph. These habitats coexist in extremely close-knit spaces that are controlled by the altitudinal and climatic factors, rendering them particularly sensitive to changes in the latter. This mosaic of habitats is one of the main factors characterising the Reserve, but it is also one feature that is extremely sensitive to pressures exerted by external factors: this is why it needs conservation measures and a perimeter delimitation to serve both as protection and for the dynamics of its interaction with the surrounding areas.

The area has therefore been divided into three zones (Core, Buffer and Transition) depending on the role that each will play in performing the functions of conservation, development and logistics.

The overall area includes 80 municipalities that have always been traditionally associated with the Tuscan-Emilian Apennines. Find them listed below, subdivided by province, in bold characters if they are new



incoming municipalities and therefore not previously included in the Biosphere Reserve. Provinces of Reggio Emilia (Albinea, Baiso, Canossa, Carpineti, Casina, Castellarano, Castelnovo ne' Monti, Quattro Castella, Reggio Emilia, Toano, Ventasso, Vetto, Vezzano sul Crostolo, Viano, Villa Minozzo), Parma (Berceto, Calestano, Collecchio, Corniglio, Felino, Fornovo di Taro, Langhirano, Lesignano de' Bagni, Medesano, Monchio delle Corti, Neviano degli Arduini, Noceto, Palanzano, Parma, Sala Baganza, Terenzo, Tizzano Val Parma), Modena (Castelvetro di Modena, Fanano, Fiorano Modenese, Fiumalbo, Frassinoro, Guiglia, Lama Mocogno, Maranello, Marano sul Panaro, Montecreto, Montefiorino, Montese, Palagano, Pavullo nel Frignano, Pievepelago, Polinago, Prignano sulla Secchia, Riolunato, Sassuolo, Serramazzoni, Sestola, Zocca), Massa-Carrara (Aulla, Bagnone, Casola in Lunigiana, Comano, Filattiera, Fivizzano, Fosdinovo, Licciana Nardi, Mulazzo, Podenzana, Pontremoli, Tresana, Villafranca in Lunigiana, Zeri), Lucca (Barga, Castelnuovo Garfagnana, Castiglione di Garfagnana, Coreglia Antelminelli, Fosciandora, Minucciano, Piazza al Serchio, Pieve Fosciana, San Romano in Garfagnana, Sillano Giuncugnano, Villa Collemandina) and La Spezia (Luni).

The area naturally stretches further into Emilia than into Tuscany due to the different morphology of the land on the two sides (see fig. 7.1). In Tuscany to the South, the Apennines have steep slopes reaching down to the Tyrrhenian and Ligurian Seas due to river incision and structural geological contact with clearly distinct units such as the Apuan Alps. In Emilia Romagna to the North, the ridge instead slopes gently down towards the Po Valley by delimiting a large area that still has strong ecological, cultural and socio-economic links with the ridge.

CORE AREAS

The Core areas have been demarcated by linking highly protected areas on the two sides of the ridge. All of the core areas fall within the protected areas of the Appennino Tosco-Emiliano National Park or of the Management Body for Parks and Biodiversity of Central Emilia.

The main feature here is the ridge: six out of the 14 Core areas are situated on the main Apennine ridge that separates Emilia-Romagna from Tuscany:

1. Monte Sillara .....2,168 ha
2. Alpe di Succiso.....1,965 ha
3. Cima Belfiore958 ha
4. Monte Cusna 4,474 ha
5. Monte Giovo..... 3,437 ha
6. Monte Cimone ..... 3,198 ha

In fact, these six Core areas run all along the ridge and are only broken up at points in which there are historical crossings evidenced by the presence of ancient hostels. Nowadays, these passes correspond primarily with a low-medium distance road network, which does not interrupt the ecosystem's continuity. The other Core areas have been identified to demonstrate the natural and scenic importance of the secondary, north-south ridges, which exclusively characterise the northern side and which run perpendicular to the Apennine ridge to reach down to the plane areas:

7. Monte Ventasso 368 ha
8. Pietra di Bismantova71 ha
9. Sassi di Roccamalatina71 ha
10. Monte Caio.....354 ha
11. Monte Prinzera.....189 ha
12. Rupe di Campotrera .....42 ha
13. Boschi di Carrega..... 876 ha
14. Fiume Taro .....873 ha

All of the Core areas constitute the mainstay of the MaB Reserve's conservation role. This is due to the fact that they are recognised as areas of natural importance and are located in areas that already benefit from significant protection among which, further to those of the National Park of the Appennino Tosco-Emiliano, those of the Integral State Reserves, the Management Body for Parks and Biodiversity of Central Emilia, and the Management Body for Parks and Biodiversity of Western Emilia (of Natura 2000 sites), and which are protected by national and regional laws including provincial territorial coordination plans (PTCP). Overall, the core areas cover 19044 hectares, with an increase of 8934 hectares compared to the current biosphere reserve.

Among the regulations protecting the Core Areas it is worth mentioning those regarding the picking of mushrooms and forest produce, that derive from regulations on a regional, provincial and mountain community level, as well as those regarding fishing, which, however, is prohibited in specific zones of both the National Park and the Regional Parks. Grazing and use of the forests are regulated instead by the "General and Forestry Corps Regulations" ("Prescrizioni di Massima e di Polizia forestale") or by the specific regional laws; forest felling, prohibited in given zones, must, however, be pre-authorised by the competent Body (either the National Park or the Regional Parks) in given areas while it is permitted in line with current regulations as far as the remaining territories that only marginally fall within the above described Core Areas.

Bringing weapons into and flying over the territory is generally prohibited unless pre-authorised by the competent Body. Camping outside the areas specifically equipped for this purpose is prohibited; whereas bivouacs or tent pitches are allowed at dusk with removal at dawn, but only in limited areas.

Within the Parks the passage of motorised vehicles is generally prohibited outside the state, provincial, municipal and dirt roads burdened by servitudes; motor vehicle access can however be specifically authorised by the competent Bodies pursuant to the "General and Forestry Corps Regulations" as well as to the general and specific relevant legislation. Intervention within Sites of Community Importance and Special Protection Areas is regulated either by the European "Habitats" and "Birds" directives, by national legislation, by general and specific conservation measures or by the management plans of the individual sites. Find here enclosed a detailed map of each core area being subsequently described.

- *Figure 7.1 - Groppi di Camporaghena*

CORE AREA M.TE SILLARA

The core area includes a scarcely anthropised, vast mountain range on the Eastern Parma ridge. It includes the northern slope of the Apennine ridge in correspondence of the Appennino Tosco-Emiliano National Park, starting just above Passo della Cisa to Passo del Lagastrello. The highest peaks are Monte Marmagna (1851 m) and Monte Sillara (1850 m), the main watercourses are the Parma and Cedra streams, which flow towards the north-east. This core area has been nominated for its glacial landforms, which are among the most southerly in Europe. The area features scree, rocks, lakes of varying magnitudes and peat bogs in a landscape that was shaped by the last ice age and the signs of which are still clearly evident. The bedrock is covered by alpine beech trees and grasslands, heaths and chasmophytic vegetation. Irregular-shaped boulders, washed down from the glaciers, jut out from ancient chestnut groves, which have established on moraine deposits. Meanwhile, at higher altitudes, various herbaceous species survive in isolated relict stands while groves of white fir, red fir and yew, found in the beech woods, result from much colder climatic periods. However, the clearest evidence of the ancient glaciers is the numerous bodies of water and peat bogs in basins and glacial cirques in which valuable plant and animal species find refuge. The rocks also bear witness to remarkable geodiversity: ranging from the barren, dark ophiolites of the Groppi Rossi to the Arenarie (sandstones) of the ridge and the layered marl and clay Flysch. At least 20 different habitats of Community interest have been identified in the area, including six in grasslands, six in forests, one in heathland, one in scrubland, two in peat bogs and, lastly, four attributable to scree slopes and rocky slopes, covering an area that exceeds 50% of the area's overall surface. The conservation status of the habitats of community interest in this core area is considered to be favourable overall.

CORE AREA M.TE ACUTO – ALPE DI SUCCISO – M.TE ALTO:

The boundaries delineate an area that runs along the northern side of the Tuscan-Emilian Apennine ridge, from the border with the province of Parma (Lagastrello) to Passo del Cerreto, and includes the articulate alpine ridge of Monte Acuto, the Groppi di Camporaghena, the Monte Alto from where it branches off beyond the rocky and historic indentation of Passo di Pietratagliata, the extremely high spur of Alpe di Succiso and Monte Casarola, which extends in a "T" shape towards the Po Valley. It then encircles, within extensive outcrops of sandstone, the two large glacial cirques, which are the source of the Liocca stream to the west and the Secchia stream to the east. The Gora, Gonella, Monte Acuto and Mesca lakes can be seen at the base of the glacial cirques and on the bottom of the basins created by the ancient moraines. They are in an advanced state of sedimentary infill and sometimes dry up entirely in the summer. Beech forests feature in the area (covering a good half of its surface) and are almost entirely managed as coppices (there are also interesting examples of coppice selection systems alongside obsolete charcoal kilns at high altitudes), as well as alpine scrublands and grasslands, alternating with scree and dark, granular sandstone, rocky cliffs, which tend to lie horizontally with smooth walls and few promontories, creating the unusual scenic effect of encircling the beautiful cirque of the Sorgenti del Secchia. The area includes areas of outstanding natural beauty (in the A Zone of the National Park) where human action is absent or insignificant (entirely conservation-based). Much of the core area falls within the B Zone of the National Park, where human action is scarce and the focus is mainly on conservation and achieving a natural balance; parts of it are classified as biogenetic

reserves. The current structures and infrastructures are used to manage the natural heritage, to foster the livelihoods of local people and to meet the goals of the Park. The features of the natural environment have therefore been affected and need to be protected. The area includes large forests, grasslands, cultivated land, both publicly and privately owned, as well as several, scattered houses. Most of the territory comprising of forests and grasslands, in the central and southern part of the site, falls within Zone B; this area is interspersed with areas that fall within Zone A, corresponding to the areas surrounding the lakes of Gora, Gonella, Mesca and Monte Acuto. Zone A primarily comprises grasslands and ridges of the Monte Alto, Monte Succiso and Monte Casarola chain.

Seventeen habitats of Community interest cover almost half the surface of this core area, of which four are priority: Species-rich Nardus grassland formations on siliceous substrates of the alpine and of the submontane areas of continental Europe, Siliceous scree of the montane to snow levels, Apennine beech forests with Taxus and Ilex, Alpine heaths and Boreal heaths, Juniperus communis formations on heaths or calcareous grasslands, Alpine and subalpine calcareous grasslands, meadows with Molinia on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae), hydrophilous tall herb fringe communities of plains and of the montane to alpine levels, mountain hay meadows, transitional and variable peat bogs, (Androsacetalia alpinae e Galeopsietalia ladani), Western Mediterranean and thermophilous scree, Siliceous rock faces with chasmophytic vegetation, meadow pioneer formations on rocky peaks.

CORE AREA M.TE VENTASSO

Monte Ventasso (1727 m) is a high massif, isolated from the peaks alongside the ridge, located between the Enza and Secchia valleys. The Beech forests, alternating with chestnut groves, flank the sides of the mountain, almost up to its summit, where the alpine grassland and bilberry scrub are interspersed with the rocky outcrops of sandstone of Monte Modino, which houses rare, rupicolous vegetation. On the southern side, pastures and uncultivated land dominate, while on the north-west, in a valley shaped by glaciers, lies Lake Calamone, which preserves an area of peat bog of significant natural importance. The core area is important for the habitats located within it or in its vicinity, which are clearly visible within the landscape that surrounds the higher altitudes: Rupicolous calcareous or basophilic Alysso-Sedion albi formations, orchid-rich, semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia), species-rich, Nardus grassland formations on siliceous substrates in the alpine and subalpine areas of continental Europe, central European calcareous scree, limestone pavements, alluvial forests of Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae), Apennine beech forests of Abies alba and Abies nebrodensis, natural, eutrophic lakes with Magnopotamion or Hydrocharition vegetation, European dry heaths, alpine boreal heaths , Juniperus communis formations on heaths or calcareous grasslands, Alpine and subalpine calcareous grassland, Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae), hydrophilous tall herb fringe communities of plains and of the montane to alpine levels, lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis), mountain hay meadows, transitional and variable peat bogs, siliceous screes of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani), western Mediterranean and thermophilous scree,

■ *Figure 7.2 - Monte Ventasso*

siliceous rock faces with chasmophytic vegetation, meadow pioneer formations on rocky peaks and Castanea sativa forests.

CORE AREA PIETRA DI BISMANTOVA

The Pietra di Bismantova is an isolated spectacular block which makes a great impact on the landscape. It is a Miocene calcarenite flat-topped elevation with steep and overhanging vertical walls and on top of it a tableland with grasslands and shrub-like formations mainly characterized by hazelnut. It is located on the top of the wide buttress that separates the Enza and Secchia basins, near Castelnuovo ne 'Monti. The surrounding hilly territory is therefore dominated by the

table mass of the Pietra di Bismantova, which forms an isolated "mesa" elongated in the NNE-SSW direction, bounded by high and steep escarpments that end up in a plateau. The spur, which due to its height of 1,047 m above sea level and its isolation, is distinctly visible from most of the Reggio Emilia Apennines, is made up of a biocalcarenite rock deposited during the Miocene in an internal continental shelf environment (Member of the Pietra di Bismantova of the Pantano Formation) that rests on clayey (varicolored Clays of Cassio) and pelitic-arenaceous sediments (Sandstones of Scabiazza, Ranzano Formation). This geological context, which sees the superposition of rocks with markedly different erodibility, is the primary cause of the current morphological structure, as the erosive processes act more effectively on the basal argillitic-pelitic formations than on the more resistant limestone above. This differential erosion, which acts mainly by wearing away the basement, is accompanied by a lateral ductile deformation, which affects the basement rocks as the weight of the overlying mass causes tensional stresses. This results in the opening of fractures parallel to the rock surface (stress release) of the rigid calcarenites. The resulting fractures cause the rocky slopes to progressively fall away, through a process of collapse and overturning, giving the relief its current form. As the Pietra di Bismantova is the remains of a much more extensive sandstone plate, which has been progressively broken down by the aforementioned processes, it is classified, from a morphological viewpoint, as a butte (erosion remnant). A steep stretch extends from the base of the Pietra di Bismantova, made up of scree of varying ages, which drops vertically down to the gentler forms of the argillitic basement, which, in turn, is affected by paleo-, active and dormant landslides.

Deciduous oak forests, cultivated fields and hay meadows, hedgerows and shrubby arid grasslands dominated by the common juniper surround the massif in a typical, subalpine landscape. Here, there are at least eight habitats of Community interest, of which three are defined as priority, covering nearly half of the site's surface area, in particular rupicolous formations and meadow pioneer formations habitats.

CORE AREA CIMA BELFIORE

The area stretches over the crest of the Tuscan-Emilian Apennines, upstream of the Cerreto pass up to the Pradarena pass, and includes the slopes of Monte Tondo (1781 m), Cima Belfiore (1810 m) and the buttress of Monte Cavalbianco (1855 m). The area is delimited downstream by the course of the Secchia river which flows north of Cerreto dell'Alpi between sheer slopes (the Schiocchi del Secchia) made up of deeply incised Monte Cervarola sandstones. The area is crossed by the Riarbero stream which then continues among spectacular sandstone outcrops, when the valley takes on the appearance of a deep ravine, with walls over 300 m. Coppice beech woods are predominating in the area while other types of woods (chestnut woods, turkey oaks woods, reforestation of pinetrees, residual red and white firs, hygrophilous woods) only cover marginal surfaces. Wide high-altitude grasslands and bilberry scrubs extend along the ridge.

Numerous habitats of community interest cover a large part of the area's surface: orchid-rich, semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia), species-rich, Nardus grassland formations on siliceous substrates in the alpine and subalpine areas of continental Europe, central European calcareous scree, limestone pavements, alluvial forests of Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae),

Apennine beech forests with Taxus and Ilex, Apennine beech forests of Abies alba and Abies nebrodensis, Alpine rivers and their ligneous vegetation with Salix elaeagnos, European dry heaths, alpine boreal heaths , Juniperus communis formations on heaths or calcareous grasslands, Alpine and subalpine calcareous grassland, Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae), hydrophilous tall herb fringe communities of plains and of the montane to alpine levels, lowland hay meadows, transitional and variable peat bogs, siliceous screes of the montane to snow levels (Androsacetalia alpinae and

- *Figure 7.3 - Lago di Calamone*

Galeopsietalia ladani), western Mediterranean and thermophilous screes, siliceous rock faces with chasmophytic vegetation, meadow pioneer formations on rocky peaks and Castanea sativa forests.

CORE AREA M.TE CUSNA

The site covers the area across the ridge of the Tuscan-Emilian Apennines, from Passo Pradarena to Passo delle Forbici, stretching south-east to Pania di Corfino and being delimited to south-west by the ridge dominated by Monte Sillano (1874 m) and to the north by the imposing massif of Monte Cusna (2120 m). Mountain hay meadows and bilberry scrubs cover a large part of the surfaces, interspersed with cliffs and rocky ledges and screes hosting a rare and relict arctic-alpine flora. The area is well known among botanists. At the lower altitudes there are beech woods coppiced and in conversion to high-forest. The waters that collect in the open glacial cirque on the north-west side of Monte Prado form Lake Bargetana. The beech woods are predominant and at times are interspersed with white firs and red firs, sometimes of exceptional size. There are also chestnut groves, oak woods, fallow lands and, in the nearby narrow valley of the Dolo stream, hygrophilous woods. There are numerous streams, marshes and pools fed by the snow melting waters. The Pania di Corfino area is ranked as an Important Bird Area for the nesting of species that can be found in marsh environments such as the Golden eagle (Aquila chrysaetos), in stable ecosystems subject to protection and only moderately disturbed by hiking activities.

Numerous habitats of community interest cover part of the area's surface: species-rich, Nardus grassland formations on siliceous substrates in the alpine areas (and in subalpine areas of continental Europe), central European calcareous scree, limestone pavements, alluvial forests of Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae), Apennine beech forests of Abies alba and Abies nebrodensis, European dry heaths, alpine boreal heaths , Juniperus communis formations on heaths or calcareous grasslands, Alpine and subalpine calcareous

- *Figure 7.4 – A view of the Pania di Corfino from the Orecchiella State Natural Reserve*

- *Figure 7.5 - Lago Bargetana*

grassland, Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae), hydrophilous tall herb fringe communities of plains and of the montane to alpine levels, mountain hay meadows, transitional and variable peat bogs, siliceous screes of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani), western Mediterranean and thermophilous screes, siliceous rock faces with chasmophytic vegetation, meadow pioneer formations on rocky peaks and Castanea sativa forests.

CORE AREA M.TE GIOVO

The area is part of the proposed extension of the current Biosphere Reserve and stretches along the ridge from the Saltello Pass (1580 m) to the West, it goes again up the ridge along the peaks of Romecchio until it reaches the top of Monte Giovo (1991 m.) and from here it descends to the saddle between Grotta Rosa and Monte Altaretto at an altitude of 1877. This Core Area therefore surrounds the Balzo delle Rose, surrounding the area of Lake Santo and it remains around 1600 m of altitude up to Passo Boccaia and from here it stretches to include Colle Monterocchi, Monte Nuda, the mountain range of Monte Terzino and the peaks of Capridosso and Sassorso. The slopes are generally steep; where they are not rocky or characterised by layers of debris, they are covered in grasslands and bilberry bushes with frequent glacial landforms such as cirques, ponds, moraine deposits and locally peat deposits in correspondence with ancient periglacial lakes. The substrate is morainic or characterized by well-stratified, sandstone successions.

In the ridge belt (generally located above the altitude where the arboreal vegetation begins to thin out or disappear permanently and is mostly replaced by the presence of mountain hay meadows, alpine grasslands and heathlands) agriculture loses any function, if not for the marginal summer use of pastures. This territorial belt therefore represents above all a great naturalistic and landscape resource, already largely subject to specific protection criteria within the Frignano Regional Park. The environmental diversification and the weak anthropic pressure make these environments particularly suitable for the development of fauna, which affects all areas with numerous species of both birds, amphibians, and mammals.

Overall, the area hosts 20 habitats of community interest, of which 4 are priority. Ten species of community interest including Columbine, Diphasiastrum alpinum, Diphasiastrum tristachyum, Gentiana lutea, Huperzia selago, Lycopodium annotinum subsp. annotinum and Lycopodium clavatum, Sphalagnum squarrosum, Sphalagnum subnitens and Sphalagnum subsecundum can be found in some peat bogs. Overall, over 103 plant species are of conservation interest (Emilia-Romagna Region target species) and 65 belong to the regional red list.

From a wildlife point of view, the area is home not only to a remarkably diversified bat fauna, but also to some individuals of wolves (Canis lupus) and to polecats (Mustela putorius). Among the amphibians, it is worth mentioning the presence of the Lessona frog, forming homogeneous populations with the edible frog Rana klepton esculenta.

CORE AREA DEL MONTE CIMONE

The area is part of the proposed extension of the Reserve, and it stretches towards the eastern portions of the Tuscan-Emilian Apennine ridge. The Monte Cimone Core Area develops in the basins of the Lima, Scoltenna, Fellicarolo and Leo streams and its altitude varies from 2,165m of Monte Cimone, in the western sector, to about 900 meters above sea level. in the central-northern sector. The perimeter develops starting from the Alpicella del Cimone (1738 m) in the North-West, reaching the actual Apennine ridge at the Libro Aperto (1937 m) and following it eastwards to Cima Tauffi (1978 m) to continue south -East up to the slopes of Monte Spigolino (1827 m); in the northern portion, the perimeter of the Core Area is included between Monte Cimone and the eastern slope of Cima dell'Arcaccia (1512 m) and further east it also includes the ridge that connects Cima Tauffi to Monte Rondinara (1646 m) and to the Monte Lancio (1549 m).

Here, the characteristics of agriculture on hilly lands tend to be rarefied and further weakened until they disappear. The area is characterized by a considerable environmental variety, which includes beech woods together with grasslands, pine forests of artificial origin, high altitude lakes, peat bogs, meadows, pastures and herbaceous crops. More in detail, the woodland, consisting mainly of White Fir, Red Fir (not native) and Beech, covers the surface in the lower portions without leaving clearings. There is also an intermediate tree layer consisting of laburnum, willow, white alder, rowan, and other species, which gradually degrade to those typical of the shrubby undergrowth. In the ridge belt (generally located above the altitude where the arboreal vegetation begins to thin out or disappear permanently and is mostly replaced by the presence of highland pastures, and alpine grassland and heathland) agriculture loses any function, except for the marginal summer use of pastures. The settlement is therefore almost absent.

For this site, 5 plant species of community interest were found, including Columbine, Diphasiastrum alpinum, Huperzia selago, Lycopodium annotinum subsp. annotinum. The fauna is typical of the Central-Northern Apennines (hare, squirrel, dormouse, polecats, marmot, stone marten, roe deer; among the birds: various species of woodpeckers, the wood pigeon, the buzzard, the woodcock and the song thrush). In particular the presence of the Golden Eagle, numerous species of bats and Canis lupus are noteworthy.

Thanks to the morphology of the territory and the geographical position a wealth of peculiar habitats can be found: over 23 habitats of community interest of which 5 are priority. The human presence has minimally affected the internal zones of this Core Area, which has witnessed a progressive advancement of the forest on the grassland since the 1990s.

CORE AREA SASSI DI ROCCAMALATINA

This is a new Core Area inserted within the proposed extension of the Biosphere Reserve. The area, like the one of the Pietra di Bismantova, is characterized by some rocky outcrops that clearly stand out in contrast with the large underlying gentle grasslands and gullies. The juxtaposition of such dissimilar hilly morphologies is related to the peculiar geological structure of the Emilian Apennines, characterized by the contact between rocks with different degrees of erodibility which here contributes to generating a further example of significant habitat and anthropic settlement complexity. The area is in fact developed in a

territory consisting of ancient chestnut groves, woods and cultivated fields, in the center of which the impressive arenaceous pinnacles stand out.

The vegetal landscape shows a wise and methodical human intervention: the stable meadows crossed by rows of cherry trees and planted fields, the arable land and the vineyards have over the centuries occupied less sloping and better exposed areas, relegating the woods to the less favorable ones. A transitional element is the presence of strips of chestnut groves, even with centuries-old trees.

These areas, in addition to the chestnut, also feature the Scotch broom, the Aquilina Fern and, more localized, the common heather. Large areas are covered with shrubs with Juniper, Dogwood, Hawthorn and various legumes (Spanish broom, sessile-leaved Cytisus and Bladder senna).

In the innermost portions, the wood fades into a shrubby vegetation from where the rugged sandstone walls of the Sassi stand out. Due to the high slope, the scarcity of soil, and the wide thermal excursions the vegetation is sparse and discontinuous, with plants that often adapt to rock life: among the most common Broom,

- *Figure 7.6 - Sassi di Roccamalatina*

Juniper, Helichrysum and, particularly abundant on south walls, the white heath which in spring is covered with small pearly white flowers. Some trees also appear on the rocks: Chestnuts but above all Downy Oaks and Flowering Ashes, with specimens with reduced crown and twisted trunk, as well as several species of the Sedum plants.

Typical of these environments are also aromatic species such as Absinthe and Thyme. The morphology of the Sassi determines a great diversity in microclimatic conditions, so that on the more shady and humid slopes, Beech and Bilberry can be found which are instead usually present at much higher altitudes.

For this reason, in this single Core Area it is possible to find more than 31% of the entire flora of the Apennine ridge. Among the species of greatest interest, there are some that are particularly rare for Emilia-Romagna, including Muscari negletum, Bibens frondosa, Vicia sparsiflora.

Other interesting species reported are orchids. Among the rarest found we find Orchis tridentata, present in only one station, and Orchis provincialis which, although not rare in Italy, has been included in the Berne Convention among the endangered species.

Among the invertebrates, the crayfish and the Lucanus cervus stand out. Among the fish species are the Lasca, the Vairone and the Cobite.

Among amphibians, various species of newts can be found such as the Geotriton, typically found near cave edges, the Alpine newt and the crested newt, as well as various species of frogs such as the Apennine and Dalmatian ones.

Among the reptiles, the Riccioli's snake (Colubro di Riccioli) is present and this is the only station reported for the Province of Modena.

There is also a wide variety of birds with over 80 nesting species including the Peregrine Falcon, the Nightjar, the Calandro and the Ortolano. There are more than 40 species of mammals including Roe Deer, Badger, Fox, Porcupine and various species of bats. The presence of the Wolf is also sporadically reported.

The Core Area of the Sassi di Roccamalatina is territorially inserted within the IT4040003 "Sassi di Roccamalatina and Sant'Andrea" SCI-SPA, a 'Natura 2000' site which hosts 18 habitats of which 5 are priority.

CORE AREA MONTE CAIO

This is a new Core Area inserted within the proposed extension of the Biosphere Reserve. Monte Caio is one of the most important mountainous massifs, offering panoramic views of rare beauty and an area of particular floristic and geological interest thanks to the presence of the Flysch formations of Monte Caio consisting of sequences of gray and yellowish arenaceous and marly-limestone layers, with dark gray clay layers; the summit is made up entirely of limestone and therefore some karst phenomena can be observed. Due to the specific geological context area has an asymmetrical geometry: the south side is steeper and more precipitous, while the north side slopes gently towards Schia and consists of meadows, grasslands and beech woods (including a beech with an estimated age of around 250 years). The area is coordinated by the Management Body for Parks and Biodiversity of Western Emilia.

The Mount is made up of numerous peaks and ridges that radiate from the main peak (Punta F. Bocchialini mt. 1584):

- North-West Ridge: Monte Novellara (mt. 1219) and Groppo d'Agna (mt. 1165);
- North-East Ridge: Monte Pesdonica (mt. 1303) and Monte Rotondo (mt. 969);
- East Crest: Corno di Caneto (mt. 1423) and Monte Botta (mt. 1027);
- Costa del Dragolare: Monte Cornata (mt. 1191), Monte La Penna (mt. 1351) e Monte Castello (mt. 972);
- South-West Crest: Punta Fegni (mt. 1485) and Groppo del Cardello (mt. 1399).

CORE AREA MONTE PRINZERA

This is a new Core Area inserted within the proposed extension of the Biosphere Reserve. The Monte Prinzera towers isolated over the Taro and Sporzana valleys and over clayey, limestone or arenaceous slopes characterised by an alternation of oak, chestnut and hornbeam woods, meadows, bushes, valleys, gullies and wetlands. The geographical position, climatic factors, rocks and soils make of this limited area (which is Site of Community Importance) a concentrated and exemplary review of landscapes, biodiversity, ecological phenomena and human testimonies of the Emilian Apennines, making it a true environmental laboratory. The scenic ophiolithic lands, similar to the high mountains, preserve minerals, rocks, waters and springs, exclusive plants such as the Prinzera montanina biscutella, winged fauna such as butterflies, red partridge, black redstart and birds of prey such as the Short-toed Eagle. The core area is also located along the route of the Via Francigena, an ancient medieval pilgrimage route, of which the parish churches of Fornovo and Bardone are suggestive testimonies.

CORE AREA RUPE DI CAMPOTRERA

This is a new Core Area inserted within the proposed extension of the Biosphere Reserve. More than half of the core area and the buffer area that surround it is covered by mixed oak forests which, in the northern sector, alternate with large grasslands and, despite the modest development due to previous timber felling interventions, create a sharp microclimatic contrast with the surrounding open environments. The downy oak prevails among the oaks, which is well suited to the arid slopes of the reserve and gives life to xerophilous formations together with ash, turkey oak, elm, field maple, minor maple, chequers tree and a rich variety of shrubs (Scotch Broom, lantana, coronilla, dogwood, juniper, blackthorn, broom, hawthorn, butcher's-broom).

In the most extreme situations, close to the ophiolitic grasslands of the core area, sporadic bushes of almond-leaved pear (Pyrus amigdaliformis), a typical species of the Mediterranean scrub, and Gallic Rose (Rosa gallica), with large intense pink flowers, can also be found. In the cooler sections, the downy oak is associated with the black hornbeam and, among the shrubs, with the hazelnut, dogwood, hairy honeysuckle and spindle trees. These more mesophilic forest areas are marked by rich nemoral blooms of hellebores, dog tooth violets, common hepatica, primroses, violets, wood anemone and lungwort. Various floristic rarities are found in oak woods and grassy clearings, often characterised by contrasting needs, such as the beautiful red lily, more common in the mountain range, the autumn squill, generally found in the Mediterranean region, and orchids such as Orchis simia, Himantoglossum adriaticum and Barlia robertiana, only lately discovered.

Even the grasslands, together with various species of grasses and legumes that are typical of the mowing meadows of the hills, feature beautiful blooms of spontaneous orchids, among which Orchis purpurea, Orchis morio, Gymnadenia conopsea and the tiny ophrids with characteristic flowers mimicking the body of insects (Ophrys insectifera, Ophrys fuciflora, Ophrys bertolonii and others). The diversity of environments in the core area allows for the presence of a good variety of animal species, with particular reference to birdlife. Up to now 5 species of amphibians have been identified in the core area and in the adjacent buffer area: the smooth newt, the crested newt, the tree frog and the green frog and the common toad. Among the reptiles, the green lizard, the three-toed skink, the green whip snake, the grass snake and the viper.

In the protected area the presence of 56 species of birds is reported, of which 29 nesting, 5 wintering and 10 exclusively present during migratory movements. The rocky walls of the core area are frequented by kestrels, jackdaws, black redstart, chimney swifts, and wallcreepers. An important presence worth mentioning is that of the peregrine falcon, sighted in the past near the cliff. The woods and bushes in the Reserve are also visited by numerous species of birds: sparrowhawks, great spotted woodpeckers, wood pigeons, hoopoes, long-tailed tits, nightjars, cuckoos, melodious warblers, common whitethroats, hawfinches, shrikes and fieldfares.

The presence of numerous bushes that occupy the abandoned crops or the marginal strips of the forest is of great importance for the birdlife, as many species find food and refuge in the tangle of shrub vegetation. The meadows and cultivated fields are frequented by nocturnal and diurnal birds of prey and by small passerines (serins, flycatchers, yellowhammers, ortolan buntings). Some important bird species nest among the tall grasses of undisturbed grasslands and abandoned crops (corn buntings, larks, wood larks, tree pipits), finding there a habitat which is elsewhere quite rare. Among the ungulates, roe deer and wild boars can be found in the Reserve, while the fallow deer are

less common. Among the carnivores, the fox, the stone marten, the badger and the weasel can be found. The area has several suitable shelter areas for bats (bats).

CORE AREA BOSCHI DI CARREGA

This is a new Core Area inserted within the proposed extension of the Biosphere Reserve. It stretches over the Quaternary fluvial terraces between the Taro river and the Baganza stream. It comprises and protects a hilly wooded area of great naturalistic, historical and cultural interest. The elegant landscape shows an alternation of woods, stable meadows and arable land crossed by numerous brooks and small artificial pools of water, created for landscaping and irrigation purposes between the end of the 19th century and the beginning of the 20th century. The protected area is of particular naturalistic and historical-cultural value. The woodland consists of mixed oak woods, chestnut groves and an ancient beech forest. The landscape is interspersed by small streams, lakes and numerous clearings, as well as by monumental gardens built around the historical villas. The intervention of Man has significantly changed the forest heritage, with the introduction of exotic species for landscape reasons, but also with the planting of species for production purposes, such as the Chestnut.

Some of the environments that today characterize the area, and many of the species present, witness the different uses to which this territory has been destined over the centuries as well as the interaction between man and the biosphere. The alternation of wetlands, natural and planted woods, meadows, bushes, moorlands and gullies determines a wide variety of floristic and plant species of ecological and historical-cultural value. Thanks to the variety of environments, the fauna is also very rich: among the macro mammals it is worth mentioning the roe deer and the badger. Among the carnivores, in addition to the badger, there are foxes, beech martens and weasels. The sporadic presence of wolves has also been recently observed, as in other hilly areas of the province; as a matter of fact, wolf distribution range has expanded throughout the entire Region. The micro mammals -linked to the presence of different varieties of trees and shrubs, but also to the piles of wood and to the dead trees present in the undergrowth- are represented by the garden dormouse, the common shrew, the dormouse and the hazel dormouse. The meadows and clearings favor the presence of the hare while, in the woods, it is common to observe the squirrel. The large hollow trees and the abandoned buildings of the Casino dei Boschi are home to some species of bats, protected by community regulations. Birdlife is also well represented, with species linked to the presence of wood such as the great spotted woodpeckers and the green woodpeckers, diurnal and nocturnal birds of prey (owls, little owls, scops owls) and small birds usually skulking in hedges and undergrowth such as Robins, Nightingales, Tits and Redstarts. Among the amphibians and reptiles of the wetlands, it is worth mentioning the Green Frogs and Tree Frogs and the rare and elusive European pond turtles, present in some of the lakes of the Park.

CORE AREA FIUME TARO

This is a new Core Area inserted within the proposed extension of the Biosphere Reserve. This is a protected area of great importance as a migration route and nesting site for various species of birds. It is characterized by riparian woods and arid meadows, quarry lakes, waterways, irrigation canals and stable meadows which coexist with landscape elements that have instead been deeply modified by Man, such as industrial parks and areas involved in mining activities. A difficult balance which is to be maintained by targeting sustainability and conservation of natural resources through strategies that make anthropic activities compatible with the protection of ecosystems. The core area has a high level of floristic biodiversity thanks to the presence of a vast mosaic of environments: about 800 species have been censused, subdivided into 100 botanical families, among which there are numerous species protected by the Habitat Directive such as orchids (multiple species), other plants typically found in wetlands (Typha spp.) and some endemic species, which live only in limited places and areas. Within the area, 17 habitats of community interest have been identified, of which 6 of priority value according to the guidelines of the Directive. As to fauna, the core area is characterized above all by the presence of valuable habitats that host over 250 species of migratory birds and some populations that are listed in EU BIRDS directive 79/409/EEC. In the river, where the water flows rapidly on the gravel and sand riverbed, multiple fish species live, that is cyprinids typical of the middle stretch of the Emilian tributary rivers of the Po river, such as the barbel, the South European nase and the chub.

Among the amphibians, which can be observed especially at the edge of the main course of the river where the water flows slowly or stagnates, green frogs, common and green toads, tree frogs, crested and smooth newts abound. Among the reptiles, it is worth mentioning the European pond turtle, the common grass snake and the less common dice snake which is closely linked to the aquatic environment. The entomofauna is characterized by some species that are important for conservation: the Hermit beetle; the Zerynthia butterfly, protected for its diminishing presence ensuing from the rarefaction of wet environments; the stag-beetle, whose adult can be observed from July to September; the Seathorn Hawk-moth, a crepuscular and nocturnal moth that has been recently found in the Taro river, while it was believed to have disappeared in Emilia Romagna.

BUFFER AREAS

The buffer areas cover an overall surface of 48576 hectares, with an increase of 22870 hectares compared to the current Biosphere Reserve. A large Buffer zone, measuring 40281 ha, surrounds all eight Core areas on the ridge, thus serving not only as a "protective buffer", but also as a natural corridor between them. The Eastern and Western Buffer Areas, instead, are isolated from each other but still linked together by the ecological axes constituted by the main rivers. The buffer zones were defined by mainly identifying areas that are already subject to a level of protection by either the Appennino Tosco-Emiliano National Park, or the Management Bodies for Park and Biodiversity of Western and Central Emilia (Parchi del Ducato; Parchi Emilia Centrale), the Network of 'Natura 2000' and through provincial territorial coordination plans.

The perimeter of the buffer zones was defined using several criteria:

- **Serving as a link between the core areas**: the adjacent core areas are often only separated by small stretches at the main crossing points and passes,

which feature historical evidence of human passage. These crossings points do not, however, form a natural break, as studies on the area demonstrate, but are genuine, natural corridors that are protected by the relevant regulations

- **Protecting the core areas**: by definition, the uninterrupted stretch of buffer zones, which encircles the core areas, supports this protective function. In some areas, the buffer zone narrows, but only where there are steep slopes and the shape of the territory itself offers sufficient protection. An example of this is where the buffer zone narrows around the Core area of the Pietra di Bismantova, following the protective perimeter of the National Park in which this important and symbolic spur is contained. This is a result of the shape and features of the Pietra di Bismantova itself (a sandstone rock rising above the surrounding, mudstone rocks), which effectively makes it isolated, difficult to access and protected by its surroundings.

The Buffer Zones include some settlements which, due to their particular geographical location, represent the outposts of excellent biodiversity and constitute the starting point for carrying out the development functions that will then be completed within the Transition Areas.

TRANSITION AREAS

The main logic behind the definition of the Transition Area was to include the territories that can claim to have an environmental, social and economic link with the Euro-Mediterranean Tuscan-Emilian Apennine ridge, i.e. from Passo della Cisa to Passo dei Tre Termini. Furthermore, considering the depopulation and ageing which affects the municipalities of the upper ridge, the downward, Eastbound and Westbound extension of the Transition Area proves the willingness to involve the human resources of the Apennines in the protection of this territory's special features, mainly by fostering their understanding and knowledge, thereby inspiring its enhancement through sustainable, socio-economic development measures. In our case, therefore, the Transition Areas include settlements, productive and tourist areas and above all extensive agricultural and rural areas which are those most suited to experimenting and spreading a sustainable development model, thereby supporting, protecting and enhancing the Core and Buffer Areas.

For these reasons, in principle, the Transition Area has been further extended by 24,3580 ha, thus totalling 430,993 ha, thereby including the entire territory of the Municipalities that have expressed an interest in the extension of the MaB Biosphere Reserve, with the exception of the following:

- the territories characterised by a clearly distinct geological unit, the Apuan Alps (Fosdinovo, Fivizzano, Casola in Lunigiana, Minucciano, Piazza al Serchio, Sillano Giuncugnano, Castelnuovo di Garfagnana),
- the territories where the relationship with the Apennine ridge is less evident in favour of a closer economic and social relationship with the industrial district of the Po Valley (Parma, Reggio nell'Emilia, Castellarano, Sassuolo, Fiorano Modenese, Maranello, Castelvetro di Modena)
- the territories of the Municipalities of Medesano, Noceto not fully included for reasons of continuity or geographical contiguity.

8. BIOGEOGRAPHICAL REGION

According to Udvardy's classification (1975), the designated area falls into the terrestrial biogeographic region known as "the Palearctic ecozone" (non-tropical Eurasia and northern Africa).

The biogeographical provinces related to the designated area can be outlined as follows:

- to the south of the Apennine ridge: Mediterranean Sclerophyll (Mediterranean)
- to the north of the Apennine ridge: Middle European Forest (Continental).

The area of the Appennino Tosco-Emiliano Biosphere Reserve is situated in the Palaearctic Ecozone (non-tropical Eurasia and North Africa) and is affected by the presence of a climatic border between two biogeographic regions (Continental – Mediterranean "Euro-Mediterranean").

A morphostructural ridge acts as a separator, characterising this stretch of the Apennines: mountains raised up by tectonic plates, which, through their shape and orientation, enable the creation of natural environments, as well as striking and unique landscapes. The Apennine ridge determines the Mediterranean climate to the south and the continental climate to the north. The climatic boundary also corresponds to a geographical (between the regions of Emilia Romagna to the north and Tuscany to the south) and cultural boundary.

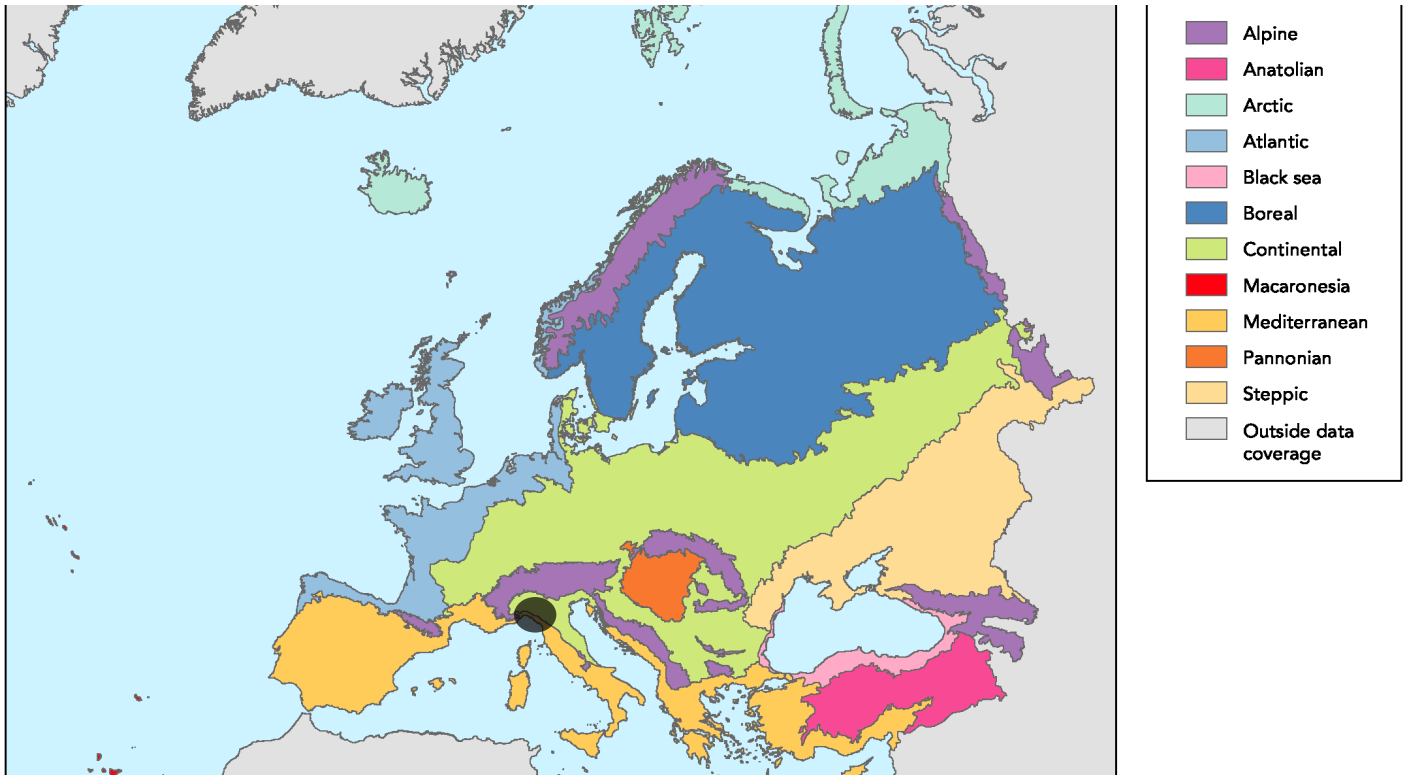


Figure 8.1 – Udvardy's Map – Biogeographical Provinces

Classification of the area where the Appennino Tosco-Emiliano Reserve is included

9. LAND USE

9.1. HISTORICAL

For a correct understanding of the area, it is necessary to know the transformations that the various physical, environmental, productive, infrastructural, settlement components have undergone over time and their sequence documented by signs, works and artifacts that make up the system of pre-existences. The mountain ranges - which in the areas included by the perimeter of the Reserve reach the highest altitudes of the entire northern sector of the Apennine chain - have been designed over time as a gateway between the cultural world of the Po valley and the peninsular world without the separative and disjunctive connotation that often determines them prevailing. Since the Late Pleistocene - in more severe environmental conditions than the current ones, such as those of the temperate interstages of the Würmian glaciation - a non-episodic attendance of the two sides of the chain is documented, (findings of flints on the Tuscan side coming from the Apennine margin of the Po valley, or diaspores processed from sites localised in Parma found in West Liguria and Provence). Thus, since Prehistoric times this ridge has been crossed for proto-trade or hunting reasons. More than a physical obstacle, in some respects this ridge has been an ecological obstacle: the use or non-use of the land depended from the first attendances on the socio-economic constraints that manifest themselves in adaptations to specialised habitats. Either their presence or absence affects the area distribution of the stable settlement.

The current structure of the Tuscan-Emilian Apennines - as a place of ancient and persisted attendance - reflects the sedimentation of the multiplicity of human activities that have allowed its colonisation over time. Human settlement is responsible not only for the opening of new production spaces and exchange paths, but, starting from historical age, for profound changes, especially in reference to the composition of the forest in the subalpine belt. For instance, chestnut woods were created at the expense of mixed oak trees, in order to support local communities; or from the opening of the high-altitude pastures, as they had presented themselves until the 19th century AD, man's work led to the drastic lowering of the limit of the tall forest that had begun in historical age.

To account for the reasons and ways of the ancient population of these areas in prehistoric times it must be assumed that the mountains of the Reserve - inaccessible in the Würm because they were occupied by glaciers - in the post-glacial were colonised and repopulated by mountain and forest fauna. At that time (preboreal and boreal) appeared the first human groups (seminomades), bearers of mesolithic activities, probably to mainly carry out a seasonal, intensive and specialised hunting activity, and, secondly, an activity of harvesting plant products. It is therefore possible to attest that a remarkable frequentation of the high Apennine mountains during the Mesolithic corresponds to a momentary abandonment in the Neolithic, due to the growth of agriculture that initially developed in the lower altitude bands, on both sides. During the Age of Metals we witness important phenomena: the civilisation of terramare spread in the pre-hilly and plains of Emilia spreads, focused on agriculture, which lead to a first wide human attendance capable of making significant changes to the territory (as evidence of this the remains of the Votive Tank of Noceto). In the mountain and ridge bands, man took back previously abandoned spaces to devote himself to pastoralism and transit according to the first real routes of transapennial traffic due to commercial and cultural exchange; on the Tyrrhenian side, the civilisation of the Lunigian stele statues was established.

The Core areas have acted as transport routes since ancient times but have remained uninhabited. The Buffer and Transition Zones, both to the north and south of the Apennine mountain range, include regions that share cultural and historical vicissitudes: inner Lunigiana (the Upper and Middle Valley of the River Magra) and the Garfagnana (Upper Valley of the Serchio) on the Tuscan side, as well as the Upper Valley of Enza and Upper Valley of Secchia on the Emilian side, were inhabited by ancient Ligurian tribes (the Apuan and the Friniati) and blended subsequently with the Celts, who had moved down from the North. They were then gradually colonised by the might of the Romans, who built an agrarian economy divided into small, medium and large estates, created using the monoculture business model, which required products to be traded in the urban markets.

The Romans spread their settlements and consequently their actions related to land use, confronting themselves with the physiographic structure of the territory. For this reason, they followed directions engraved by streams or sections of the ridge that became more penetrable due to structural reasons. These concepts took shape in a design that based its perspective axes on road directions that connected the two sides through the ridge. Important examples include Parma-Luni and Parma-Lucca (also called the "Hundred Mile Road") that passed through the Apennines at the Passo di Valoria and passo di Cavorsella, respectively, reaching the sea and the Garfagnana.

Of these ancient routes, only the place names and very short stretches remain, however this road triangle - Parma Luni, Lucca - testifies how the territory which had applied for Biosphere Reserve represented a unicum already at the times of Romans, interpreted since then with respect to what the geological heritage granted, and perceived as a strategic place with potential land uses functional to the supply and settlement along safe strategic passes that could quickly connect Tuscia and Emilia.

A defensive system of "Castra", created to defend the conquered territories, ran along both sides of the entire Apennine mountain range, reaching as far north as the Castle of Canossa itself, where several finds suggest the presence of a Roman fort built to defend the new city of Luceria (in the current village of Ciano d'Enza).

It is on this ancient system of military structures that a network of larger fortifications that also included those defensive bastions of the communication routes that from the Apennine passes descended to the Po river had inserted since the Early Middle Ages, at the time of the Lombard Age and then in the time of Matilde of Canossa. That identity also materialised in the creation, in the Lombard age, of an administrative district belonging to the centre of Bismantova: the name of this district was handed down to us by two documentary sources of Carolingian age such as gastaldus Bismantinus.

- *Figure 9.1 – Mushrooms in a beech forest.*

It is precisely the villages that have developed since this ancient network of fortifications, as well as the churches, convents and fortresses built in the middle Ages that convey a sense of homogeneity to the culture and landscape of the territories forming the Buffer and Transition Areas. An important testimony is provided by the Natural and Semi-Natural Protected Landscape Collina Reggiana – Terre di Matilde, 22,581 hectares of territory protected by the Management Authority for Central Emilia Parks and Biodiversity, which includes the Municipalities of the Reggio area of Albinea, Baiso, Canossa, Carpineti, Casina, Castelnovo ne' Monti, Vetto, Vezzano sul Crostolo and Viano.

Another example is represented by Luni disputed between the Byzantines and the Lombards stabilised under the rule of the latter, it was plundered by repeated Saracen approaches weakening until the reorganisation of the 10th century, according to the model of the "curtes" - rural land properties that would greatly influence the subsequent feudalisation and framing of the territory. In this historical context it emerges that the settlement organisation and, in a certain sense, also the current infrastructure, do not deviate from that structure that at various times has undergone adjustments to the temporary physical, economic, military and religious needs without replacing the pre-existing one. Take, for instance, the role that this territory has played in the context of European roads, becoming on several occasions a strategic corridor between Northern Italy and Tyrrhenian Tuscany, and more generally between Europe and the Mediterranean. During the Middle Ages, pilgrims, armies, merchants and politicians had crossed the Val di Magra traveling from North to South (and vice versa). It was in the Middle Ages that the most important European historical route, the Via Francigena, was born in these places.

In the absence of large-scale turmoil, this gradual transformation has made it possible for reminders of successive eras to be handed down to the present day, both through the general layout and accompanying features. The most evident and widespread evidence of the various historical periods is represented in the religious and military architecture, manufacturing, settlements and infrastructure.

The military architecture as depicted by forts, fortresses, castles and walled settlements is an extremely interesting element; an irrefutable sign of the need to defend against expansionist goals or to consolidate political – territorial organisation.

The ancient inhabited settlements, evidenced by the current agrarian structure, are situated predominantly on hilly and rugged terrain. They respond to the dual need for defence, on the one hand, and, to "use up" the smallest possible land quota for agricultural use, on the other. They are located predominantly within the range of altitude from 400 m to 800 m above sea level. This range determines the threshold of permanent settlements, the zone below being allocated to forest and grazing and the one above to agriculture and sowing. The latter shows certain distinguishing features dating back to the dawn of the technique of producing seasoned cheeses, such as today's Parmigiano Reggiano cheese PDO (probably after the year one thousand, in convents or social structures of a certain longevity). This differentiated landscape, designed by man over time, is the cornerstone of the project "Landscape School of Parmigiano Reggiano" promoted by the Biosphere Reserve, the Appennino Tosco Emiliano National Park and the Parks of the Dukedom together with the Municipalities of Carpineti, Casina, Neviano degli Arduini and the Union of Appennino Reggiano Municipalities. The project has been active since 2018 and developed in close collaboration with the Emilio Sereni Archive Library - Alcide Cervi Institute, in summary with the aim of enhancing the landscape aspects

related to these agri-food productions, promoting a widespread culture and encouraging local development through the relationship between this agri-food chain, sustainable and healthy tourism and the network of hiking and food and wine routes.

Centres used mainly for commercial purposes are located at the foot of the valley, along the busier transportation routes, while the mountain pastures used for grazing can be found at higher altitudes. These seasonal dwellings, linked directly to the phenomenon of transhumance, have a specific pastoral and agricultural use.

Elements, such as chestnut cultivation, that have endured within the production sector, bear witness to the passage of time in terms of the agricultural system to which they are linked, so much so that they can be viewed as historical-cultural phenomena necessitating conservation and promotion.

The territories to the south of the ridge are identified by the presence of a building heritage throughout the area: this feature relates to intense fragmentation of the land due largely to insufficient arable land in relation to the size of the settled population. This led to the utilisation of more marginal and morphologically challenging areas for the construction of artificial terraces.

As the villages grew, the forests suffered progressive losses to make way for crops. They were also burned by shepherds to encourage the growth of valuable pastures for grazing. The crops were essentially the same as those traditionally grown since antiquity, whereas pastoral farming continued to complement and supplement agriculture.

Chestnut cultivation has, for centuries, served as one of the most deep-rooted and popular livelihoods throughout the Apennines on both the Tuscan and Emilian sides. As a result, the chestnut grove has become a key feature of its cultural landscape, along with historically significant rural structures associated with it, such as the "metati", drying rooms used for drying the fruit, and the mills, for grinding and producing the flour. Although, generally speaking, the chestnut is no longer a key element of the mountain economy, in the area of the Biosphere Reserve the vast wealth of knowledge and traditions associated with it has remained part of the local culture and is the subject of growing interest and increased awareness, particularly in relation to sustainable tourism. In this context are inserted: the project "Terre di Castagno" of the LAG Antico Frignano and Appennino Reggiano, which represents an action of tourist enhancement of the chestnut grove contained within the Local Action Plan (LAP) 2014-2020 of the Reggiano and Modenese Apennines; the initiatives of the "Autumn of the Apennines" program promoted by the LAG Antico Frignano and Appennino Reggiano and the Appennino Tosco-Emiliano National Park in collaboration with the Mountain Community of Frignano and with the Municipalities that support the project of the tourist enhancement of the Chestnut Grove. The interest in the heritage of chestnut cultivation has certainly been encouraged by the recognition as D.O.P. products of the "Farina di Neccio della Garfagnana" and the "Lunigiana chestnut flour". An important testimony of the recovery of ancient brown traditions is also represented by the "chestnut of Fontanaluccia" (or "Tosca") produced in the homonymous hamlet of the Municipality of Frassinoro (MO): the fruits are in fact dried again according to the ancient art of wood-burning "metati", and then be ground in the old water mills.

The growing of grapevine and olive trees, on the other hand, had shaped since ancient times the terraced slopes still widespread on the Tyrrhenian slopes of the Biosphere Reserve that host quality productions such as Colli di Luni PDO, Liguria di Levante PGI and Costa Toscana PGI wines and Lucca PDO, Riviera Ligure PDO

and Toscano PGI extra-virgin olive oils. An exceptional testimony of terraced crops also exists north of the Apennines, in the Municipality of Vetto, where a particularly favourable microclimate allowed these typically Mediterranean crops since ancient times and where a research project for recovery and reuse has been started recently. Outside the terraces, the Emilian sector of the Biosphere Reserve still has an important land use by the numerous wine crops, especially in the pre-hilly areas, where 9 are grown between PDO and PGI among which the most important is that of Lambrusco which have the most important centres in the hills of Castelvetro, Puianello, Monte delle Vigne and where historical and traditional vinegar production is also important, in particular balsamic vinegars, between the provinces of Modena and Reggio Emilia.

Landscapes dominated by forests, but also characterised by a broad diversity of spaces, have set the Apennines apart over the centuries despite the recent increase in the size of the forests, particularly at higher altitudes or on sloping land with unsuitable gradients for motorised farm vehicles. In the period between the unification of Italy and the years immediately preceding World War I, a significant reduction in the size of the forested area was seen, due largely to the expansion of agricultural and pastoral lands. The forest then began it inexorable growth and is now approximately three times larger than in the 1920s, which is a huge increase considering the relatively short time-frame. The assessment should bear in mind the fact that modern statistics have dramatically changed detection criteria: Inventario Nazionale, ISTAT and FAO in 1985, as well as the 2005 forest inventory compared to the Corine 2000 inventory. Consideration should be given to the fact that these differences are more or less equal to the potential errors of detection relating to the results from the second half of the nineteenth century and early twentieth century.

The area is an example of how the basis of Italy natural landscape was altered long before the Roman Empire and is still apparent in the beliefs of its inhabitants who refer to the forest "as a garden" and as the forest as the focus of work, needing to be penetrated and cultivated throughout.

The evolution of the forest landscape is particularly significant, not only in terms of the actual area covered, but also in terms of the meaning attributed to it to this day. Despite a lesser focus on the forms of forest landscape compared to agricultural landscape, the influence of the forests is deeply rooted in the community, not only for their distinct relationship with agriculture and pastoralism, but also due to the wide use of wood for different purposes over the centuries. Compared to the enhanced diversity of the agricultural and pastoral landscapes, which arises from the associated range of uses of such land, the forest landscape tends to be simpler and homogeneous. In fact, diversity can be seen mainly within the species and their internal structure, as opposed to the variety of the species.

In 2018 The Appennino Tosco-Emiliano National Park promoted the establishment of the "Centro Uomini e Foreste d'Appennino" ("Apennines Man Centre and Forests"), a permanent discussion table on forest issues, in particular with the aim of developing projects for the conservation and growth of biodiversity and to make the Park a hub of production and dissemination of a higher forest culture. The proposed table aims to bring together the following subjects: Regions, Unions of Municipalities, Consortia, Civic Uses, private owners and technicians, professional and environmental associations in the area of the Biosphere Reserve and the Apennines. Also interesting is the project present in the Reserve Action Plan under the name "Conservation of the Park forests: first pilot interventions for the adaptation of the Lagastrello forest to climate change". The project involves the National Park and Enel Green Power and has the fundamental

purpose of experimenting and verifying the effectiveness of forestry interventions to increase the resilience of the Apennine forests with respect to climate change.

It is worth mentioning that it is not only agronomic factors, but also environmental factors such as the gradient, the geological substrate and the rainfall patterns that have played an important role during the formation of the Apennine landscape.

CHANGES IN LAND USE OVER TIME

MUNICIPALITIES OF THE RIDGE AND THE TUSCAN APENNINE HILLY AREA

The following considerations are the result of the comparison of georeferenced aerial photos of 1954, 1978 and finally of 2010-2011. All data can be downloaded from the website of the Tuscany Region.

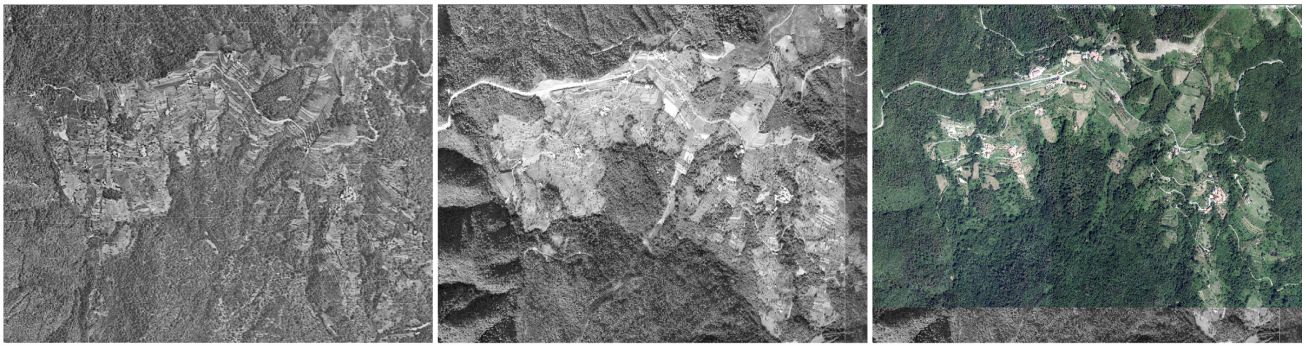
The analysis of land use data between the 1950s and the present day allows to identify some variations that can be summarized in a couple of main and macroscopic themes and other numerous topics of secondary importance.

The main themes are certainly linked to the progressive abandonment of rural activities and pastoralism in mountain areas, a phenomenon that has affected almost the entire territory south of the ridge.

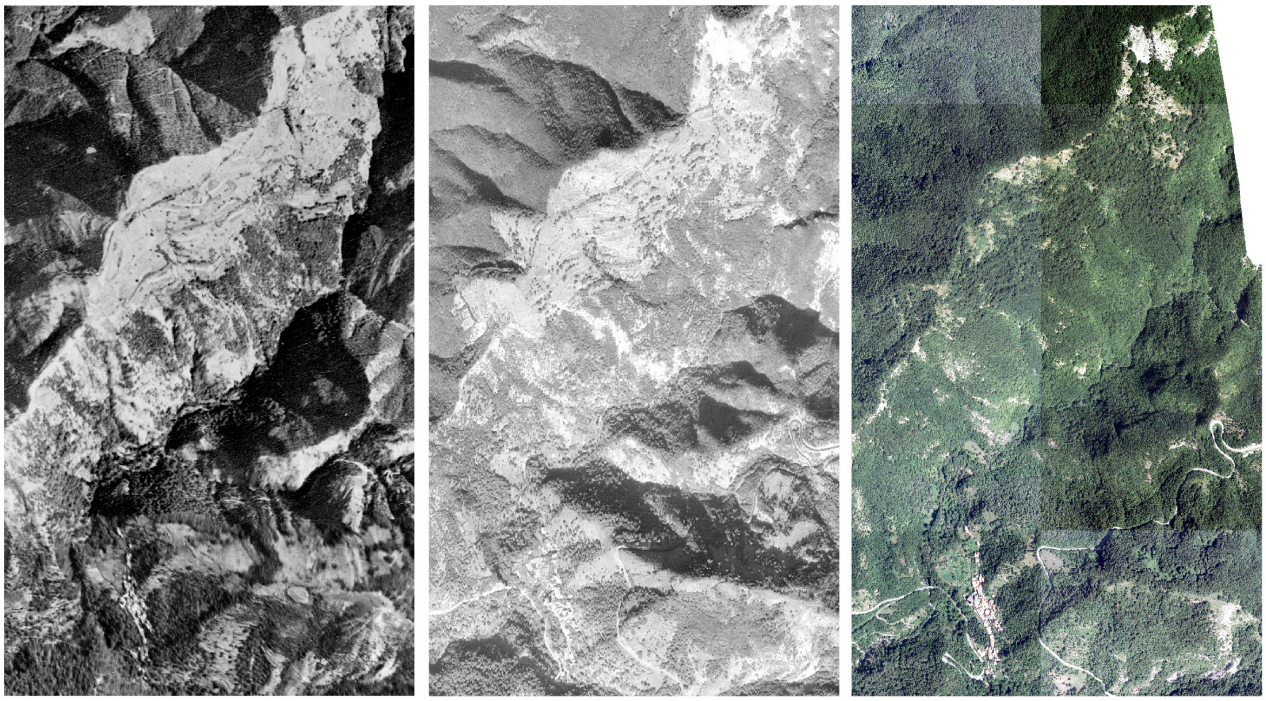
In the Lunigiana the farming of mountainous areas, with their characteristic terraces, has suffered more or less everywhere a progressive abandonment from the 1950s to the present day that has led to a reduction in the area cultivated around some small inhabited centres or the total afforestation of entire areas in isolated areas and far from the inhabited centres. Significant examples of this phenomenon can be observed in the Municipality of Licciana Nardi, between Cisigliana and Paretola, in the Municipality of Filattiera, between Vignolo di Lusignana and Passo della Colletta, in the Municipality of Bagnone; it is especially in the western sectors that the phenomenon is marked as in the Municipality of Pontremoli, where the locality Costa Badina, once cultivated, is now completely abandoned and covered with forest, and in the Municipality of Zeri, where the entire eastern side of Monte La Pelata (with a very indicative name) that was entirely terraced for cultivation until the 1950s now has a dense and continuous forest cover. A small different example is represented by the territory between the towns of Novegigola, Meredo and Bocceda in the Municipality of Tresana: here mountain agricultural activities were well maintained until the 1970s, perhaps also thanks to the construction of new road infrastructures, but since then a slow abandonment of both settlements and the same activities has followed. In Lunigiana, the abandonment of grazing areas was also an important and progressive phenomenon, particularly evident in the border area between the municipalities of Fivizzano, Licciana Nardi and Comano, near the town of Torre del Nocciolo, where pastures were still very evident in the 1970s but have now been replaced mostly by large wooded areas. Other examples can also be seen in the municipalities of Casola in Lunigiana, near Regnano, and Filattiera, near the towns of Passo della Colletta and Vignolo di Lusignana.

The territory of Garfagnana shows even more obvious signs of the abandonment of rural mountain areas. The Municipality most marked by this phenomenon is that of Sillano Giuncugnano where the examples are not lacking, starting from the towns of Torrione and Colle Bacciarelli (Capoli) where cultivated areas up to the 50's

Bocceda - Novegigola (Tresana)



Costa Badina (Pontremoli)



Torre del nocciolo (Fivizzano)

of the last century quickly left room for the creation of large dense wooded areas, or in other cases very evident near the inhabited areas of Dalli Sopra and Dalli Sotto and in the areas south of Lake Viscaglia. Other important testimonies of the phenomenon can be observed in relatively easy-to-access hamlets such as Treppignana and Riana, in the Municipality of Fosciandora, and especially in the area west of Monte Frignone, in the Municipality of Piazza al Serchio, where there is no longer any trace of the terraces cultivated here until the 1950s. The abandonment of grazing areas was also important in the territory of Garfagnana particularly visible due to the strong afforestation between Giuncugnano and Regnano, at the passage between the Municipalities of Sillano Giuncugnano, Minucciano and Casola in Lunigiana.

Despite the changes induced on the territory by the progressive abandonment of agriculture and mountain pastoralism, in some areas it is still possible to observe a rural landscape practically unchanged from the middle of the last century to today. This is the case of the territory between Villa Collemandina and the nearby Castiglione di Garfagnana or, as far as pastures are concerned, mention is made of the alpine pastures north of the Municipality of Pieve Fosciana and Fosciandora.

Topics of secondary importance for land use changes over time in the Buffer and Transition Areas of the Reserve are those related to the development of activities of economic importance (agricultural, industrial, extractive, tourist, etc.). The anthropic impact on the territory linked to these activities is in fact relatively weak, concentrated in a few areas, and has been "controlled" over time also by the general trend of demographic decline of the Municipalities of the area.

In limited areas of Lunigiana and Garfagnana, mainly industrial small and medium-sized activities have developed over time, which have led to a local modification of land use in the municipal territory. The most obvious cases are present in the Municipality of Aulla, which over time has assumed the role of main industrial centre of Lunigiana, as evidenced by the changes of the territory both in the hamlet of Albiano Magra and in the capital itself where the progressive development has also led to the extension of anthropized land at the expense of the riverbed of the Magra river. In the municipalities of Licciana Nardi (e.g. near Canale Scuro) and Castelnuovo di Garfagnana it can be seen that some areas of the valley floor, cultivated until the 1950s, were supplanted by industrial buildings whose activities probably led to an increase in building areas and a progressive abandonment of the land cultivated near the adjacent inhabited centres. The phenomenon is also clearly visible near Pieve Fosciana where the progressive abandonment of the fields is also accompanied by a regrowth of the forest near the town. The variation in land use may not only be linked to the construction of industrial buildings but also to the evolution or development of holdings linked to livestock farming or agriculture. This is the case of trout farming plants built between the 1950s and 1970s, including Pontebosio in the Municipality of Licciana Nardi. In the municipality of Fosdinovo, near Celso there is an almost unique phenomenon in the area and connected to the transition from extensive to intensive agricultural crops, in particular with regard to the cultivation of olive trees and vines, which took place between the 70s and the present day.

A separate chapter concerns the impact of mining on land use changes. The quarry areas correspond mostly to areas cultivated already in times before the 1950s, with a few exceptions. Between the 1950s and 1970s mining activities were started in the municipalities of Casola in Lunigiana, Villa Collemandina and recently Castelnuovo di Garfagnana near Regnano. In any case, these activities are of little impact and occupy a limited area. Almost all of the quarry areas are

located in wooded areas far from the population centres and the main valley floor. The only exception is the mining area near Sassorosso in the Municipality of Villa Collemandina, which is next to the residential area.

The development over time of tourist activities has not brought with it marked changes of the territory. In this, the territories of the Tuscan side, which are part of the Reserve, differ from those of some neighbouring Municipalities where there have been important variations, in limited areas of territory, linked to the development of ski resorts (e.g. Abetone area developed since the 1930s). A curious example of changes related to tourist activities in the area can be seen in the municipality of Sillano Giuncugnano, near Mount Argegna, where between the 50s and 70s there was an increase in the area cultivated with the presence of a cultivated forest that between the 70s and the present day was practically dismantled to make room for a camping area.

A final topic in which changes in land use can be included on the Tyrrhenian side concerns the evolution of the infrastructure network. In fact, in some places the construction of road infrastructure, and not only, has led to major changes in the surrounding area. A first example is the construction between the 1950s and 1970s of the A15 motorway (E33) of the Passo della Cisa which produced important modifications throughout the Lunigiana and in particular in the Municipality of Pontremoli. Here between the towns of Pollina and Il Groppo, it is observed how the construction of the road work has brought with it a local increase in hydrogeological failure with the activation of two small landslides and the progressive abandonment of cultivated

Pollina (Pontremoli)

Sassorosso (Villa Collemandina)

areas around the work itself; the same infrastructure shows a strong impact even on the territories further downstream, as between Aulla and Albiano Magra. In the Municipality of Piazza al Serchio, near Petrognano, the passage of the high-voltage lines brought with it the deforestation of an important wooded area.

The comparison of historical aerial photos from the 1950s to the present has allowed to observe important variations concerning the course of the streams and rivers of Lunigiana and Garfagnana. In general, there is a trend of marked decrease in the solid transport of water courses, especially secondary streams, resulting in strong afforestation of their river beds and in rare cases with the expansion of anthropogenic activities within the river beds themselves. These observations can be made for example in the municipality of Casola in Lunigiana, near Codiponte, in the municipality of Piazza al Serchio, near Cogna, and in the Municipality of Sillano Giuncugnano, near Villa. This phenomenon seems very marked at the passage between the 1950s and 1970s and could largely be linked to the installation of numerous hydraulic works along the basins of the main rivers. Finally, there is a completely opposite trend on the part of the Magra river within the Municipality of Podenzana, small town La Piastre, where there is a constant expansion of the riverbed over time due to erosion of the eastern shore.

A development of its own had the area at the Orecchiella Lodge and just west of the same (San Romano in Garfagnana). Here between the 1950s and 1970s there was an increase in cultivated areas and pastures with the development of some infrastructure (roads, houses). The area was then abandoned and underwent a strong afforestation between the 1970s and today.

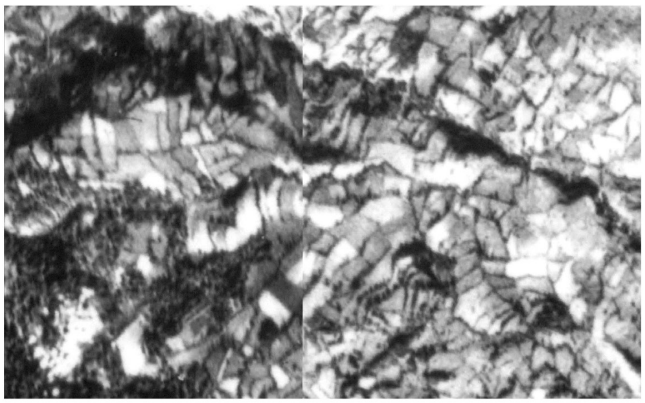
MUNICIPALITIES OF THE RIDGE AND THE EMILIAN APPENNINE HILLS AREA

The territory of the ridge, also thanks to the interventions in favour of its conservation implemented by the National Park of the Appennino Tosco-Emiliano and other bodies (Central Emilia Parks), has not undergone remarkable variations in land use over time. Nevertheless, the territories bordering the ridge have undergone the following important changes.

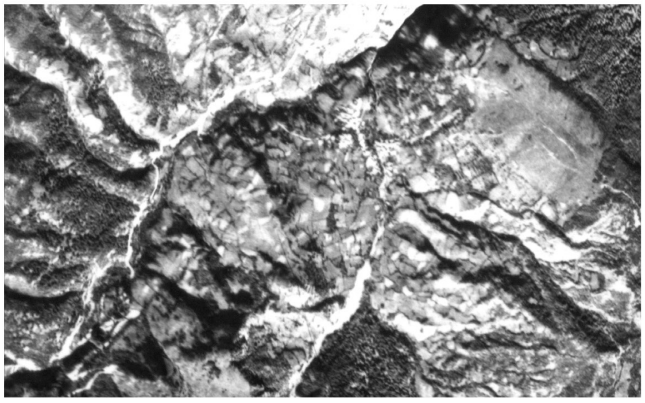
The main observable phenomenon concerns the abandonment of large cultivated areas that have undergone extensive reforestation since the 1950s. The cases are numerous and distributed over several municipalities, and namely at Casa Re (Fanano), between Casa Gallo and La Piana and along the western slopes of Mount Cimone (Fiumalbo), in widespread areas of the Municipality of Frassinoro, at La Marina (Montecreto), along the eastern side of Monte Nuda (Pievepelago), at Rimagna and Valditacca (Monchio delle Corti), at Casalino, Cerreto Alpi and between Ligonchio and Laghi (Ventasso), at Civago and Costa Sologno (Villa Minozzo). The aforementioned localities represent exceptions in the territories of Fanano, Montecreto and Pievepelago, which in most of the territory show a rural fabric almost unchanged over time, with some places where the appearance of the landscape is almost as it was in the past (e.g. the upland near S. Annapelago). The territories of the Municipalities of Ventasso, Villa Minozzo and Frassinoro have instead undergone the reforestation of large areas of land once cultivated.

What has been observed for mountain crops can also be found in some areas that were once used for grazing. A strong advance of the woodlands can be observed for example at Balza della Rosa or on the western slopes of Monte Cimone (Fiumalbo), at Monte Navert (Monchio delle Corti) and in some localities of the Municipalities of Fanano, Berceto (area south of Mount Tesa, 1143m) and Corniglio.

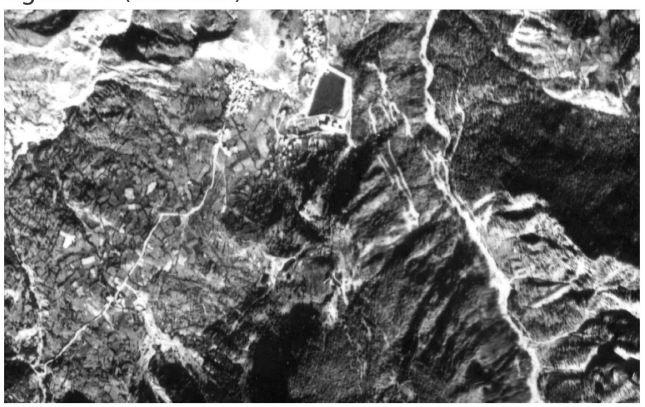
Casalino (Ventasso)

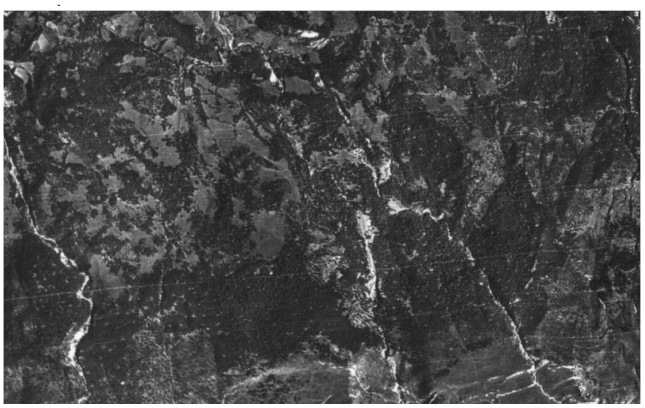


Cerreto Alpi (Ventasso)



Ligonchio (Ventasso)





The anthropic impact on the territory adjacent to the Apennine ridge is mainly depending on the construction of ski resorts and ski lifts, which were built starting from the 1930s (the pioneering facilities of Abetone), and had then a strong development in the 1950s -1960s by thus originating an important tourist economic activity. The area around the Monte Cimone ski area has undergone the heaviest impact, especially in the municipalities of Montecreto and Riolunato. There are also numerous small and medium-sized ski areas scattered around the ridge: Corno alle Scale (Fanano), Piandelagotti (Frassinoro), Monte Cantiere - Piane di Mocogno (Lama Mocogno), S. Annapelago (Pievepelago), P.so del Lupo and Pian del Falco (Sestola), Lagdei (Corniglio), Pratospilla (Monchio delle Corti), Ospitaletto, Cerreto Laghi, Monte Ventasso (Ventasso), La Romita and Alpe di Cusna (Villa Minozzo). In this context it is worth mentioning the "Cerreto Laghi 2030" project funded by the Municipality of Ventasso and the Tuscan-Emilian Apennine National Park and aiming the urban regeneration of Cerreto Laghi. The primary objectives of the project are: the re-harmonization of the landscape lines of the places partially challenged by the presence of ski resorts and related infrastructures; laying the bases for a new all-inclusive mountain visitor center that can be used during all seasons.

In the areas "behind" the Apennine ridge, the phenomenon of urban expansion of inhabited centers is not widespread, except for the capitals of the Municipalities of Sestola and Villa Minozzo, which starting from the 1950s have undergone a remarkable expansion into the neighboring territories.

Finally, these areas were not remarkably impacted by the extraction activities which are in fact limited to the gravel, sand and clay quarry in Castellonchio, near Collagna (Municipality of Ventasso), exploited in the second half of the last century and now no longer active.

The considerations regarding the following paragraphs are the result of the comparison of the IGM GAI 1954 aerial photos with the TEA 2014 and 2017 orthophotos, which can be observed on the Emilia Romagna Region website (http://geoportale.regione.emilia-romagna.it/it/applicazioni-gis/regione-emilia-romagna/cartografia-di-base/cartografia-storica/volo-igmi-gai-del-1954). Unfortunately, no aerial photos are available for these territories of the intermediate time between the 1950s and the present-day.

In the second half of the last century, the establishment of small and medium-sized industries in the main centers and capitals of the Emilian municipalities, north of the Apennine ridge, led to an important increase in the percentage of land which, subtracted from cultivation, was destined to residential and industrial urban expansion. This phenomenon can be found on various scales within each municipality of the hilly belt and in each capital, but it is observed markedly in the municipalities of Langhirano, Guiglia, Calestano and Canossa (Ciano d'Enza), where development has generally affected all the territories of the small towns in the valley. The same phenomenon, even if of minor entity and essentially limited to the capitals, has anyway affected other municipalities in the hilly, high-hilly and mountainous area; this is the case of Zocca, Casina, Castelnovo de 'Monti, Viano, Serramazzoni and Prignano sulla Secchia. The Municipality of Toano, nearby the locality of Fora, in the valley of the Secchia river, represents quite a unique case, since it substantially houses the only important industrial complex of the Emilian hilly area of the Reserve, with the exception of the industrial areas of Langhirano and Canossa, which however are at much lower altitudes.

An important phenomenon that has influenced the land cover changes in this Apennine sector concerns the development of extractive activities. These activities show a greater impact in the high-hilly and mountainous belt connecting the main centers and areas of the ridge, but they are also widespread in the other hilly areas. These are mostly quarries where now mining operations are partially discontinued and which were exploited in the second half of the last century for the extraction of raw materials for the ceramic industrial district (Val Secchia, Val Tresinaro, Val Panaro). The extraction centres of Castagneto in the Municipality of Baiso, La Dorgola in the Municipality of Carpineti, Roncobotto di Zocca and those of Monte Zirone di Terenzo and Montecreto had a remarkable impact; in the valley floors gravel and sand quarries can frequently be found in the bed of some rivers and streams, such as in the localities of Ghiare di Berceto and Cantoniera di Vetto. In some quarries mining operations have been discontinued, therefore they are now subject to regeneration interventions (e.g. the Castagneto di Baiso quarries, also thanks to a European project) or have undergone a change of use, such as the Roncobotto di Zocca quarry which now houses a landfill for urban solid waste (MSW).

Apart from industry and mining activities, other economic activities do not prove to have a strong impact on the hilly area. However, some local importance cases of land use variations are worth mentioning: the ski resorts in the Schia-Monte Caio area, Municipality of Tizzano Val Parma, which are the only ones distant from the ridge areas; the imposing photovoltaic system of Monte Montanara, Municipality of Guiglia, which covers about twenty hectares once covered in woodland.

In this sector of the Biosphere Reserve, the phenomena of abandonment of crops and pastures and the subsequent afforestation of large areas are neither widespread nor accentuated. As a consequence, a large part of the territory looks today as it used to look in the 1950s. This is the case of the Municipalities of Marano sul Panaro, Baiso, Carpineti, Castelnovo ne 'Monti, Toano, Vetto, Polinago, but also of more markedly mountainous areas such as Montefiorino, Terenzo and Tizzano

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Fornovo di Taro

Val Parma, where the landscape seems not to have changed over time. In some municipalities, including Casina, Palagano, Palanzano and Montese, the phenomenon of abandonment of crops is very limited, as for example in Canossa where it is visible between Monte Pelengo (501m) and C. Carazzeto. The municipalities of Calestano, Langhirano and Neviano degli Arduini, in the Parma area, and those of Sestola and Lama Mocogno, in the Modena area, represent instead the areas where the phenomenon appears locally more evident. Clear examples of abandonment of cultivated areas are the Querceto and Quinzano localities, in the Municipality of Langhirano, and as regards the abandonment of areas used for grazing, an indicative example are the western slopes of Monte Cavalcalupo, on the border between the Municipality of Calestano and that of Corniglio. Another phenomenon which is added to the previous ones and which proves to be evident, in particular in the Modena sector of the Reserve, consists in the progressive reduction of the fragmentation of the cultivated areas; this can be observed transversally with examples in the Municipality of Fanano, at the Sasso di Fanano, near Lama Mocogno and between Sestola and Bacconi.

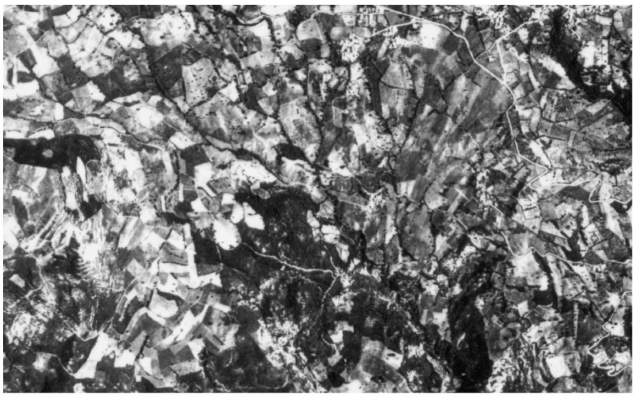
The analysis of the photo areas also made it possible to observe a singular phenomenon of soil variation over time: for many watercourses, both streams and rivers, from the 1950s to the present day, a highly remarkable reduction in the extension of the riverbeds can sometimes be observed. Several examples can be noticed in all the provinces of the territory. In the Modena area, an example is the Acquicciola stream, near Fiumalbo, and the Dardagnola stream near Montespecchio (Montese), which owe the modifications to the installation of hydraulic works, or the Rio Torto near Riolunato; in the Parma area, an example is the Mozzola stream, in the territory of Berceto, and in the Reggio area another example is the Atticola stream, in the Municipality of Vetto.

MUNICIPALITIES IN THE PRE-HILLY APENNINE AREA AND THE HIGH EMILIAN PLAIN

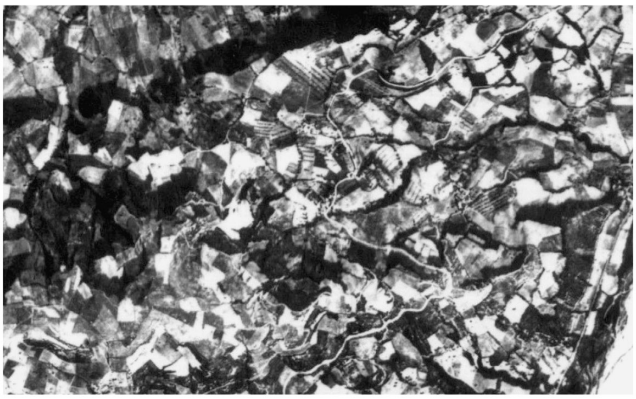
On the basis of the data analyzed, different trends in land cover changes could be observed between the 1950s and the present day and it was possible to distinguish the pre-hilly area and the high plain from the more markedly hilly area of the Emilia sector. The most significant data regarding the phenomena already described in the previous paragraph are presented below.

The urban expansion, both at an infrastructural and at a residential and industrial level, was naturally more marked in the municipalities of the pre-hilly area and the high plain of Emilia, compared to the hilly areas. The reason for this can be easily understood if we consider the presence at the northern limit of the Biosphere Reserve (and partly within it) of three important cities ranging among the main economic and logistic centres of Emilia-Romagna: Parma, Reggio nell'Emilia and Sassuolo. The remarkable growth of these centers -that took place from the post-war period to the present day- has entailed the natural development of peripheral centres so that areas previously entirely dedicated to crops have gradually left ample space locally for new industrial poles and important city centers, in particular along historical access routes to the big cities, which often run along important Apennine waterways. In the municipalities of Fornovo di Taro, Felino (both in the town centre and in the hamlet of San Michele di Tiorre), Medesano (especially in the hamlet of Felegara) and Noceto, in the Parma area, and in the Municipalities of Quattro Castella and Albinea (both in the town centres and in the hamlets of Crostolo-Pareto-Ponticelli) Castellarano, in the Reggio area, and in the Municipalities of Maranello, Fiorano, Castelvetro and

Querceto (Langhirano)



Quinzano (Langhirano)



Commenzano (Toano)

Fora (Toano)

Marano sul Panaro, in the Modena area, highly remarkable changes can be observed. It is also interesting to note that, especially in the Parma area, small towns have proportionally witnessed a much more marked phenomenon than the urban and industrial expansion of large cities towards the territories of the Biosphere Reserve.

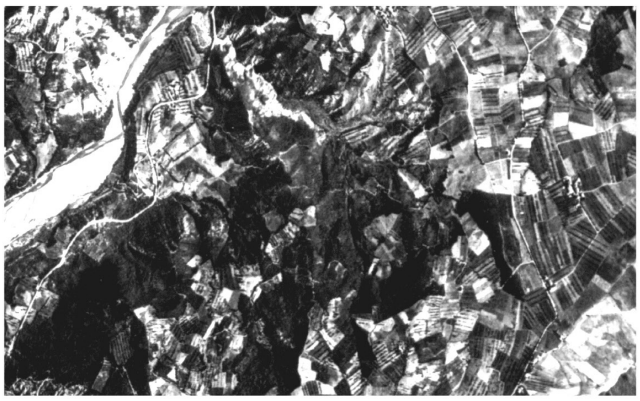
Extractive activities have also had a significant impact on the modification of the territory over time, in the pre-hilly and high-plain of Emilia, and namely in the valley floors. The major activities and therefore the greatest impacts are essentially concentrated in the valleys of the Taro and Secchia rivers. Excluding the large quarry at La Chiastra (Municipality of Fornovo di Taro) which now produces inert materials for construction from recycled materials, a very large number of quarries are scattered throughout the territories of the Municipalities of Collecchio, Medesano and Noceto. In large part these are extractive activities virtually obtained in the bed of the Taro river for the exploitation of gravels and sands and many of them are now abandoned and subject to recovery and regeneration projects. The growing development of extractive activities and craft and business districts, which have led to a strong anthropic modification of the territory, added to the presence of agricultural lands but also of highly natural areas, led in 1988 to the birth of the Taro River Regional Park. The Park was born with the aim of conserving and restoring the precious ecosystems present here and to safeguard this stretch of river which represents an important ecological corridor. The most important interventions carried out by the Park include the recovery of the Laghetti di Medesano (also including some experimental nursery interventions) and the naturalistic area of Le Chiesuole (Collecchio) which now represents one of the most important artificial wetlands in Northern Italy and an exemplary case of good management and reuse of an abandoned mine site. The management of the delicate balance between human activities and the protection of the present ecosystems is therefore one of the main characteristics of this Core Area of the Biosphere Reserve.

Apart from industry and mining activities, other economic activities do not prove to have a strong impact on the pre-hilly and high plain areas. However, some local importance cases of land use variations are worth mentioning: the recent construction in the Municipality of Fornovo di Taro of a large landfill for solid urban waste (MSW); the construction in the 1980s in Sala Baganza of a large Golf Course (about forty hectares) which replaced a large cultivated area; the construction of a cross-track at Stadirano, in the Municipality of Lesignano de 'Bagni.

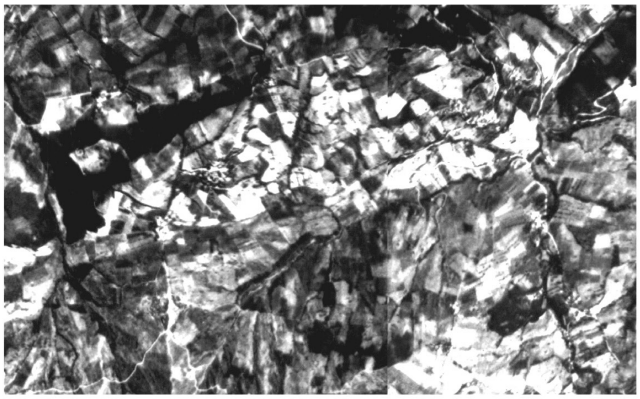
The abandonment of cultivated areas and pastures in this sector of the Biosphere Reserve is a very limited phenomenon, if not absent, in most of the territory. Even here, perhaps surprisingly, the landscape has remained almost intact between the 1950s and the present day. Outside the inhabited centers, which as mentioned above have had a great development in the pre-hilly and high plain areas, the land cover appears unchanged over time in the Municipalities of Quattro Castella, Marano sul Panaro, Fornovo di Taro, Felino and Albinea. In this context, the only counter-trend example, is the afforestation of areas previously occupied by crops characterizing the Municipality of Lesignano de 'Bagni, especially if one observes the area near the town of Faviano di Sopra. The reduction of the fragmentation of the cultivated areas does not appear so marked in the territory, even if it can be observed for example in the Municipality of Marano sul Panaro, near Villabianca.

Finally, even -and even more so- in the upper plain, a marked phenomenon of reduction in the extension of the river beds can be observed. The phenomenon is quite transversal as it is observed both for the smaller

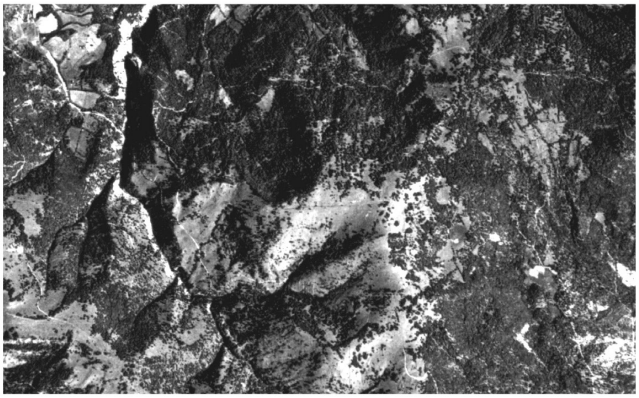
M. Pelengo (501m) (Canossa)



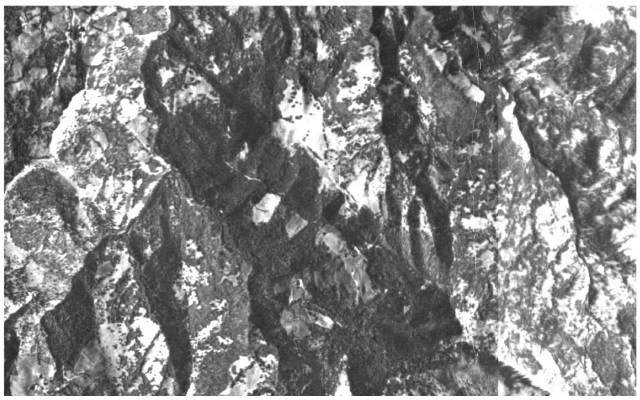
Faviano di Sopra (Lesignano de' Bagni)



M. Cavalcalupo (Calestano)



M. Tesa (Berceto)



watercourses, such as the Rio Torto near Marano sul Panaro or the Sporzana stream near Fornovo di Taro, and for the main ones. In particular, the example provided by the riverbed of the Crostolo stream near Albinea and those of the Parma and Baganza streams before joining their flows near the city of Parma itself are emblematic. The phenomenon is also evident for the Taro River in the entire stretch running within the homonymous Regional River Park, but in this case, we have already described how the strong exploitation of the riverbed is mainly due to the numerous extractive activities of the recent past.

For some of the municipalities that enter the Biosphere Reserve, there have been significant changes to land cover in the last 50 years, however concentrated in the external part of the perimeter. In particular in the municipalities of Castellarano, Sassuolo, Fiorano, Maranello, on the border of the Biosphere Reserve, an intensive industrial settlement has developed along the foothill road network, particularly specializing in the ceramic sector. In these municipalities the perimeter of the Biosphere Reserve stops upstream of these industrial districts. In these municipalities, intensive industrial development has effectively separated the territory into two distinct areas, even visually: one that has preserved the traditional land cover (within the Biosphere Reserve) and the other that has been profoundly modified by urbanization resulting from industrial growth.

In conclusion, Corine Land Cover data relating to variation in land cover recorded between 2012 and 2018 within the Biosphere Reserve were observed. The percentage of the territory that has undergone changes in land cover is decidedly small and this therefore seems to follow the trends described for the past, in which the changes have occurred progressively over a long period; from a numerical point of view, only 0.25% of the surface of the Reserve was affected by these changes. More in detail, it is observed that in 38 Municipalities there are no recorded changes and in only 4 Municipalities there are "significant" variations, exceeding 1% of their territorial extension: Tizzano Val Parma (1.64%), where sparse vegetation has taken the place of some agricultural lands and woodlands (although the change is mostly linked to the recent development of the large landslide present in the adjacent municipality of Corniglio); Comano (1.53%), where deciduous forests give way to evolving woodlands and shrublands; Podenzana (1.04%), where part of the evolving woodland and shrubland gives way to true mixed coniferous and deciduous forests; Guiglia (1.03%), where some mining areas have been replaced by industrial areas and by evolving woodland and shrubland.

Analyzing the data for the various sectors of the Reserve, specific relative trends can be observed. In the pre-hilly and high plain of Emilia, the greatest relative impact of the variation in land cover is given by the abandonment of extraction sites in favor of the development of evolving woodland and shrubland, together with the transformation of anthropic areas used for buildings that have been transformed into actual residential areas. Minor phenomena are the loss of areas covered in deciduous forest that have left room for beaches, dunes and sands within the limited sectors of the river beds of the Taro and Baganza rivers, and the beginning of exploitation of new extractive activities to the detriment of cultivated land. In the Emilian hilly area, the main relative phenomenon concerns the transformation of wooded areas into deciduous forests and cultivated land areas in areas with sparse vegetation or with evolving woodland and shrubland; and within this context, the impact of the aforementioned landslide area in the Municipality of Tizzano Val Parma is of relevance. The Apennine ridge shows almost exclusively relative phenomena of transformation of deciduous forests into areas with evolving woodland and shrubland; these relative phenomena are

also the most widespread and significant in Lunigiana, a sector where the percentage variations are greater, and in Garfagnana, even if in the latter case there are numerous situations in which the variation in land cover is substantially opposite to the trend indicated, therefore canceling the effects in the total calculation.

9.2. WHO ARE THE MAIN USERS OF THE BIOSPHERE RESERVE? (FOR EACH ZONE, AND MAIN RESOURCES USED

The main users of the land within the Reserve (Core, Buffer, Transition) are local people. The land is predominantly used for agriculture (fodder, pasture, chestnut groves, olive groves, vineyards, grain), but tree felling for the production of firewood is also widespread.

Traditional practices (hunting, fishing, mushroom picking), which were once a key part of the livelihoods of the local people and are now relevant predominantly in terms of cultural heritage and recreation, are widespread throughout the territory.

Descending the upper portions of the ridge towards the two slopes (from the Core areas to the Transition areas), land use intensifies, transitioning from spontaneous and collective to organised and private.

More specifically, throughout the Core areas, human use of the land is rather limited. It is sporadic and consists largely of human settlements in the form of isolated and scattered dwellings. This is mainly as a result of tree felling for the production of firewood, under the regulations imposed by the Appennino Tosco-Emiliano National Park, in the aggregate and collective form of rights of common (usi civici) for the benefit of the local people (rights of common means the community members' right to use municipally-owned land; it is not part of formal legislation but is rooted in collective practice). The moorlands of the highest areas are used for the collection of blueberries, according to the rules imposed by the Protected Areas (Appennino Tosco-Emiliano National Park, Regional Parks, in addition to the Natura 2000 network sites included in the areas of the ridge), especially by residents both for private and entrepreneurial purposes. Only subsequently they are used by local farms that use the areas for grazing or, less commonly, for the harvesting of fodder intended for feeding cattle in the Parmigiano Reggiano supply chain.

While there is a higher number of human settlements in the Buffer zone, the use of land for human purposes remains limited with a continuing predominance of tree felling for firewood production (for both public and private consumption) in line with current conservation regulations. Meanwhile, its agricultural use by local businesses is increasing and the cultivation of fodder on the north side is increasing. Likewise, chestnut groves, used primarily for the production of chestnut flour, are starting to appear on the south side. On the north side, in small areas of the Buffer zone, the land is also used for "tourism" purposes, with ski runs for cross-country and downhill skiing.

The number and scale of human settlements in the Transition areas increases significantly as you descend towards the valley on both sides. As a result, the use of land for urban and residential purposes also increases. However, the main users of the land in the Transition areas are the local farms: on the northern side, the land is predominantly used for fodder to feed the "Parmigiano-Reggiano cows", and at lower levels also vineyards for the production of Lambrusco DOP. while on the southern side, there is a strong presence of cultivated chestnut and olive groves, as well as vineyards (particularly in Lunigiana), spelt and other grains (particularly in Garfagnana).

The tradition of tree felling for the production of firewood continues, however, in these areas, those benefitting are mostly private individuals (rights of common are much less widespread), who both sell and consume it personally.

Small but organised clusters of small businesses, focusing mainly on the processing of food products (e.g. Parmigiano Reggiano PDO, Prosciutto di Parma PDO). Especially on the Reggio and Modena side, on the edge of the Biosphere Reserve, there is the presence of industrial settlements for the production of ceramics and the related clay pits (mostly in disuse).

9.3. WHAT ARE THE RULES (INCLUDING CUSTOMARY OR TRADITIONAL) OF LAND USE IN AND ACCESS TO EACH ZONE OF THE BIOSPHERE RESERVE?

The traditional uses of natural resources that can be found on both sides of the mountains in the Reserve are mainly associated with agricultural and zootechnic activities, using the trees to produce firewood, tapping the water resources for irrigation and energy production (everywhere from mills to hydroelectric power stations), gathering products from the undergrowth, managing the chestnut groves and pastures, hunting and fishing.

Figure 9.2 – Spelt of Garfagnana

Near the ridges, some of these activities were and continue to be regulated by Rights of Common. More recently, the above-mentioned activities have been joined by more modern tourism and production activities, particularly in the food and agriculture sector.

In the Core area, a high level of protection is guaranteed. The National Park corresponds to Zone 1 (area "of significant interest in terms of nature, landscape and environment, with little or no anthropisation") and part of Zone 2. In these zones, the majority of human activities are forbidden and strict regulations – and in some cases complete bans – apply for fishing, chopping down trees for wood, camping, the construction of new

buildings and technological facilities, new efforts to tap or divert water, access with motor vehicles, taking weapons into the area and flying over it. The same applies to other Core Areas covering Regional Parks and Protected Areas.

In the Buffer zones, a good level of protection is guaranteed because they are partially covered by the National Park, the Regional Parks and Natural reserves as well as the Sites from the Natura 2000 Network; coordinated action is taken by the territorial bodies to regulate and plan any human activities, including limited conversion of land, use of the woods, grazing, gathering mushrooms and products of the undergrowth, hunting and fishing.

The majority of settlements and human activities are concentrated in the Transition areas. The basic regulatory framework is provided by planning on and above the municipal level, as established by local structural and coordination plans that encompass protection for specific spheres and topics such as health, landscape, geology, culture, history and archaeology. A part is played in this by specific authorities, especially Cultural and Environmental Heritage Departments.

In the Transition area, there are also some areas with natural environments and landscapes of significant interest: Sites from the Natura 2000 Network, Paesaggio Naturale e Seminaturale Protetto della Collina Reggiana – Terre di Matilde (Protected Natural and Semi-natural Landscape of Reggio Hills- Lands of Matilda) established in 2011.

Urban and landscape planning is present and in force throughout the territory. As a result of European laws and directives, Natura 2000 Sites pursue the following purposes, strictly consistent with the strategies of the UNESCO MaB program:

- preserving the equilibrium in the ecosystem which is based on alternating natural areas and zones used for agriculture, zootechnics and forestry;
- making the most of the territory's history, culture and heritage;
- supporting the competitiveness of the agricultural world and giving hillside agriculture a suitable role based on a multifunction approach involving activities such as environmental services, protecting the territory, providing accommodation, educational initiatives and craft schemes;
- promoting environmental education;
- consistently managing the existing stock of buildings by renovating and converting constructions of interest and historical importance and demolishing/reducing the impact of inappropriate/derelict ones;
- redeveloping the residential system and curbing plans that are not compatible with the goal of making the most of the territory.

9.4. DESCRIBE WOMEN'S AND MEN'S DIFFERENT LEVELS OF ACCESS TO AND CONTROL OVER RESOURCES

Italian legislation provides for and guarantees gender equality.

10. HUMAN POPULATION OF PROPOSED BIOSPHERE RESERVE

The numbers in the table below are approximate estimates, because at present no detailed censuses are available of the permanent and seasonal residents in the Core Areas, Buffer Zones and Transition Areas of the Reserve. The population density was estimated based on the average density per building for residential purposes on an area of 1 Km².

In the Core Areas, the "seasonal" inhabitants are the managers of mountain refuges and guesthouses, and the tourists staying in them (the arrivals data were used).

In the Buffer Zones and Transition Areas, the seasonal inhabitants include both tourists (the arrivals data were used) and the owners of "second homes", some of whom spend long periods of the year in the territory. There are no other climatic, cultural or economic circumstances that lead to a significant presence of seasonal inhabitants. It should be noted that in 2020, also as a result of the COVID-19 pandemic and widespread experimentation with forms of remote work and smart-working, the prolonged use of second homes or long-term tourist rentals, has significantly increased; today it is not easy to predict whether this trend will consolidate in the coming years and to what extent.

	Permanently	**Seasonally**
Core Area(s)	201	1,200
Buffer Zone(s)	10,715	24,000
Transition Area(s)	367,508	121,300
Total:	378,424	146,500

- *Resident population calculated through population density data published by ISTAT (2019 update). For the estimate of the seasonal population, statistical yearbooks of the various provinces relating to the tourism sector were used and data proportionate to the distribution of the accommodation facilities in the reserve area (excluding, for example, the tourist flows of the cities of art).*

10.1. BRIEF DESCRIPTION OF LOCAL COMMUNITIES LIVING WITHIN OR NEAR THE PROPOSED BIOSPHERE RESERVE

The territory in the Reserve takes in 80 municipalities that are spread over 6 provinces: Modena, Parma, Reggio Emilia in the Emilian part (with 22, 17 and 15 municipality respectively), and Lucca and Massa Carrara in Tuscany (with 14 and 14 municipalities in the Reserve respectively), and La Spezia in Liguria (Luni).

Uniform data are available for survey periods in each municipality in the six provinces, so it is possible to produce a reliable profile of the population composition and demographic trends.

In general, data referring to the period from 2012 to 2019, evidence an average stability of the demographic structure for the Municipalities of the Emilia sector (in which, considering the capitals of Parma and Reggio nell'Emilia, for the relative provinces we note trends of growth of 11% and 6% respectively compared to 2012) and La Spezia, while a weak depopulation has marked the Municipalities of the Tuscan sector. The areas of the Reserve where the Core Areas fall have low population densities and a tendency to population decline in recent years. The parts in the Transition Area are often growing, in some cases even with significant increases, while there are some municipal areas where the demographic trend tends to be stable (with slight decreases or increases depending on the case). At the same time, municipalities with negative demographic trends are also widespread throughout the territory

Looking at the data up to 2019, interesting demographic trends on a provincial basis are highlighted. The Municipalities of the Province of Modena within the territory of the Reserve show an overall trend of weak demographic decline, of about 3%, spread equally across the territory between the ridge bands and those of the hills and plains; significant examples are Palagano (approximately -10%, corresponding to -225 residents), Riolunato (approximately -9%, corresponding to -65 residents) and Zocca (approximately -6%, corresponding to -290 residents); an opposite trend stems from the data of the Municipality of Marano sul Panaro (approximately + 9%, +435 residents), Maranello (+ 6%, +1065 residents), Serramazzoni (+ 5%, +398 residents) and Sassuolo (+2.5 % approximately, +986 residents) which can be explained by the presence of productive activities adjacent to the plain. The Municipalities of the Provinces of Parma and Reggio Emilia show similar trends that indicate demographic growth concentrated in the areas of the low hills and the plains, which contrasts with a widespread depopulation of the areas of the high hills and the ridge (a very marked phenomenon in the Reggio territory). As evidence of this, we highlight the growth trends in the Parma area of the Municipalities of Langhirano (+ 7% approximately, +688 residents), Collecchio (+ 6% approximately, + 842 residents) and Lesignano de 'Bagni (+ 6% approximately, + 277 residents) and in the Reggio area the municipalities of Castellarano (+ 3%, +472 residents) and Quattro Castella (+ 2% approximately, +273 residents); among the municipalities in demographic decline in Parma in the ridge area, Monchio delle Corti (about -10%, -101 residents) , Berceto (about -7%, -147 residents) and Corniglio (about -7%, -146 residents) are highlighted and in the low-hill area of Fornovo di Taro (about -3%, -157 residents), while for the Reggio area the Municipalities of Vetto (about -7%, -135 residents), Villa Minozzo (about -7% , -269 residents) and Ventasso (-6% approximately, -283 residents). The Municipalities of the Tuscan provinces of Lucca and Massa-Carrara show a general trend of demographic decline from 2011 to 2019 which can be estimated at around 4% of the resident population; although they are numerically negligible figures, they have a great impact on some local realities if we consider the decline in municipalities such as Sillano Giuncugnano (about -11%, -121 residents), Minucciano (about -10%, -231 residents) or Zeri (About -15%, -180 residents) or Fivizzano (-8% about, -670 residents); the only municipality in contrast is represented by Pieve Fosciana which shows a growth of about 2% (+58 residents). It should be emphasized that the Municipalities of the Reserve in the Province of Lucca show a trend in contrast with the overall provincial one. Finally, as regards the Municipality of Luni,

no significant population changes have been noted in the last decade, a figure in line with the general one of the Province of La Spezia.

Overall, the territory of the Reserve shows a growth trend of 4% between 2012 and 2019, but the figure is strongly influenced by the presence of the cities of Parma, Reggio nell'Emilia, Maranello and Sassuolo. If these cities are excluded, it can be observed that the general trend is of a substantial demographic stability characterized by a demographic decline, even marked in the ridge bands, counterbalanced by the population growth in the territories of the medium-low hilly areas. The demographic indicators considered (old age index, turnover index and structure of the active population) are very high everywhere, meaning the high incidence of the elderly population, even in the active population. In detail, as of January 1, 2019: the average old-age index within the Reserve is 197.5 and varies between the minimum in Reggio Emilia (149.6) and the maximum in La Spezia (242.3), raised to the Italian national average (173.1); the turnover rate of the active population is 160.5 and varies between the minimum in Reggio Emilia (134.3) and the maximum in Lucca (183.4), high if compared to the Italian national average (160.5); the index of the active population is 153.6 and varies between the minimum in the Parma area (141.6) and the maximum in La Spezia (168.6), also high if compared to the national average (138.7). It should also be considered that, although the data of these indicators are above the Italian average, in the Reserve area the growth of values from 2011 to date has been limited compared to that recorded at the national level.

This demonstrates that the Reserve and the extension area can count on young, dynamic human resources that can play a strategic role in turning to account and protecting the outstanding qualities of the territory.

Generally speaking, the socio-economic structure of the reserve is based on agriculture and processing high-quality goods (PDO Parmigiano Reggiano, PDO Prosciutto di Parma and PDO Prosciutto di Modena PGI Aceto Balsamico di Modena, CGDO Lambrusco, PDO oils, PDO honey, PGI Spelt of Garfagnana) as well as craftsmanship and public and private services. The education and health services (secondary schools and hospitals) are located and coordinated around the municipalities that have taken on a more distinctly urban nature over time (Sassuolo, Pavullo nel Frignano e Serramazzoni in the province of Modena, Collecchio, Fornovo di Taro and Langhirano in the province of Parma, Castelnovo ne' Monti in the province of Reggio Emilia, Barga and Castelnuovo di Garfagnana in the province of Lucca, Aulla, Fivizzano e Pontremoli in the province of Massa-Carrara) and of course the provincial capitals Parma and Reggio nell'Emilia while companies involved in agricultural, zootechnic, forestry and pastoral activities can be found throughout the territory. The more traditional forms of tourism involving summer holidays and winter breaks in the snow are more concentrated in the higher areas.

Commuting to neighbouring industrial districts and areas is a common phenomenon everywhere on both the north and the south side of the Apennines, a phenomenon that today represents both an environmental and a social problem, but which could turn into an opportunity if the practice of remote work is consolidated. Throughout the reserve, integration between agriculture and tourism is growing, as demonstrated by the constantly increasing number of agritourism establishments. This would seem to present a new employment opportunity for young people which would allow them to remain in their homeland.

The fresh interest shown by the younger generation in agricultural employment opportunities is growing. Data related to the period before the Reserve

designation emphasised substantial increase in students enrolling at Agricultural Colleges (+ 12% in 2014). This attitude is traditionally more widespread on the Tuscan side, Significant proof of the changes in this respect is provided by the great the number of applications for funding concerning the Rural Development Plans of the Emilia-Romagna region: calls for Misura 112 "Settlement of young agriculturists" of the 2007-2013 Rural Development Plan, received more than 400 applications only in the provinces of Parma and Reggio Emilia; the same trend can be found with regard to the 2018 call relating to points 6.1.01 "Settlement of young farmers" and 4.1.02 "Modernization of farms of young farmers" of the RDP 2014-2020, where 113 out of 270 applications admitted for funding come from the provinces of Parma, Reggio Emilia and Modena. Among the beneficiaries of the contributions, the percentage of women remains significant, which in the provinces of Modena and Reggio Emilia is equal to and higher than that of men. The figures from the latest census show that on average the Italian farms run by young agriculturists are larger, rear more animals, often use organic methods and diversify by moving into agritourism; generational turnover is of great strategic importance, especially for the territories in the Biosphere Reserve, which are prepared to try out innovative practices in many fields, including agriculture.

In the municipalities participating in the future Reserve, as at 31 December 2019 (ISTAT) there were 100,842 foreign citizens from 146 countries around the world. The percentage of the total population reaches the considerable figure of 13.4%. The top 10 communities of foreign nationality present on the territory are: Romanian (12,523 - 14.1%), Albanian (9537 - 10.8%), Moroccan (8858 - 10%), Moldovan (6975 - 7.9%), Ukrainian (4,586 - 5.2%), Chinese (4405 - 5%), Nigerian (3928 - 4.4%), Tunisian (3357 - 3.8%), Ghanaian (3211 - 3.6%) and Filipino (3165 - 3.6%); altogether these 10 communities make up almost 70% of the total foreign population in the Reserve. By observing the individual provincial and municipal territories it is possible to make numerous further observations. In the Province of Massa-Carrara, in the individual Municipalities of the Reserve area, the largest communities are alternating between Moroccan and Romanian, with the exception of the Municipality of Villafranca in Lunigiana where the Albanian community prevails. In the Province of Lucca the largest community in almost all the Municipalities of the Reserve is the Romanian one, with the exception of the Municipalities of Barga, where the biggest community is the Albanian one, Villa Collemandina and Fosciandora where the largest community of foreign is that from the United Kingdom (widely present throughout the Lucca area). In the Province of Reggio Emilia the largest community of foreign nationality by far in the individual Municipalities of the Reserve is the Moroccan one, alternating with the Albanian one (which for example is the largest in large centres such as Reggio nell'Emilia and Castelnovo ne 'Monti) and Romanian. in the Municipality of Albinea the largest community is the Indian one. In the Province of Parma the largest communities of foreign nationality are the Romanian (the most widespread in many municipalities and also in the capital), the Moroccan and the Albanian, with important nuclei of Sri Lankan citizens in the Municipalities of Terenzo and Calestano and an Indian community prevailing in the Municipality of Corniglio. In the Province of Modena, in the Municipalities of the Reserve the largest communities are Moroccan and Romanian, but Moldovan (the largest in Fiumalbo) and Kosovar (the largest in the Municipalities of Riolunato and Montecreto) are also important. Finally, for La Spezia, the Municipality of Luni shows a conspicuous Romanian community. The percentage distribution of the foreign population on the territory of the Reserve is also interesting. It should in fact be emphasized that the Tuscan and La Spezia areas show a marked lower presence of the foreign population compared to

the Emilian one. Specifically, the Municipality of Luni in La Spezia shows a 6.1% foreign population, a value equal to the average figure for the Province of Lucca where a variation with higher percentages is observed only in the main inhabited centres, while the average figure is of 8.2% in the Province of Massa-Carrara with the Municipalities of Casola in Lunigiana and Villafranca in Lunigiana exceeding 10%. As regards the Emilia sector, in the Province of Reggio Emilia the foreign population average is 8.6% with four municipalities over 10% and the peak figure recorded in the capital with 16.4%; in the Province of Modena the average figure is 9.7% and in eight municipalities the foreign population exceeds 10%, with an interesting peak in the Municipality of Pievepelago which despite being on the Apennine ridge has a percentage of 14.2% , since it probably explains the demographic growth trend (2011-2019), in contrast with the neighbouring municipalities; finally, in the Province of Parma there is the highest average figure, 11.7%, with 13 Municipalities of the Reserve over 10% and two Municipalities with more than 20% of foreign population, Calestano and Langhirano (exceeding 21, 3%): such data easily explain the considerable demographic growth registered in the area in the last decade. When it comes to the number of countries of origin for the individual Municipalities, it is observed that the centres with the largest number of foreign communities in the Tuscan and La Spezia sector are large centres such as Luni, Aulla and Barga (with 51.51 and 46 different nationality respectively) while in the Emilian sector Zocca and Guiglia in the Modena area (41 and 39), Quattro Castella (61) in the Reggio area and Collecchio and Medesano (69 and 62) in the Parma area, with the peaks of course in the provincial capitals of Reggio nell'Emilia (125) and Parma (137).

Overall, the Biosphere Reserve is made up of a multi-ethnic society and, as for an important part of the Italian Apennines, identifies great potential in terms of renewing human resources precisely in foreign communities. The designation and extension of the Appennino Tosco-Emiliano Biosphere Reserve also intends to seize the opportunities associated with this multiculturalism.

10.2. NAME(S) OF THE MAJOR SETTLEMENT(S) WITHIN AND NEAR THE PROPOSED BIOSPHERE RESERVE WITH REFERENCE TO THE MAP (SECTION 6.2)

The Biosphere Reserve area covers land from 3 Regions of Italy: Emilia-Romagna with the provinces of Reggio Emilia, Modena and Parma, Tuscany with the provinces of Massa Carrara and Lucca, and Liguria with the province of La Spezia. In total, there are 80 municipalities in the territory, covering approximately 49,8613 hectares. In the Reserve area, there are 27 main settlements:

Albinea (8,805 inhabitants, ISTAT 2019) is located in the Province of Reggio Emilia, about 10km south of the capital. The main development of the Municipality took place after the Second World War, while historically its hamlets have hosted castles (Albinea, Montericco, Borzano) and important villas. During the Second World War the territory was the scene of the "Operation Tombola" where one hundred men of the "Allied Battalion" and Italian partisans destroyed a section of the German general command in Italy which

was based at Villa Rossi and Villa Calvi; this event is still remembered by the community. Today Albinea is an important municipality connecting the city and the Reggio hills, a strategic role that it also plays in the Transition Area of the Reserve. It is home to important services such as the Comprehensive Institute of Albinea (1 Kindergarten, 2 Primary Schools and 2 Secondary Schools) and the "Luca Lotti" Music School; its position also makes it suitable for cycling. The community is very active in organizing events, such as Albinea Jazz (at its 32nd edition in 2019) and the Autumn Festival of "balsamic Ciccioli (pork cracklings) ", and among the associations, the Tourist office (Pro Loco) is important, which in 2019 celebrated the 80th anniversary (one of the oldest in the province). The CEAS Intercomunale Rete Reggiana (Municipalities of Albinea, Bibbiano, Campegine, Canossa, Poviglio, Vezzano sul Crostolo) is active in involving the community in the knowledge of attractions in the area. Among the most important ones : the SAC IT4030017 "Ca ' del Vento, Ca 'del Lupo, Gessi di Borzano "and inside the Geosite of the Emilia-Romagna Region of the" Gessi del Castello di Borzano "; here numerous natural cavities are present in the Messinian gypsum, among which above all the Tana della Mussina, of archaeological importance and considered a prehistoric burial cave. Finally, the birth in Albinea in 2008 of the first Municipal Acetaia (Balsamic Vinegar Production facility) in the province, at the Villa Tarabini complex, is underlined, from a project in collaboration with the Consortium for the Protection of Traditional Balsamic Vinegar of Reggio Emilia PDO.

Aulla (11,067 inhabitants, ISTAT 2019) is located in the Province of Massa-Carrara, about 35km north-west of the capital. It is the largest commercial and industrial centre in the historic region of Lunigiana, where many companies in the manufacturing and construction sectors are based. The development of the Municipality has been guaranteed in historical and modern times by its natural crossroads position, at the confluence of the Taverone and Aulella streams into the Magra river. Aulla today hosts the passage of important roads (SS62 of the Cisa Pass, SS63 of the Valico del Cerreto, A15 Parma-La Spezia) and railway lines (at the intersection of the Pontremoli railway with the Lucca-Aulla line, known as the "Garfagnana line"). Even in the past, especially in the Middle Ages, the Municipality represented a fundamental stage along the main communication routes, in particular along the Via Francigena, whose thirtieth stage (itinerary of Sigerico) ended at the Abbey of San Caprasio, with its pilgrims' house run by volunteers which houses the Pilgrim Museum with archaeological discoveries from the Roman, early medieval and medieval periods. Aulla also actively participated in the war of liberation, so much so that it was awarded the Gold Medal of Civil Merit. Finally, this crossroads of waterways and communication routes is controlled from above by the Brunella Fortress, an imposing building of military Renaissance architecture with a square plan of which there are testimonies starting from the sixteenth century. The fortress houses the Lunigiana Natural History Museum which focuses on the relationship between the human activities of the agro-forestry-pastoral civilization and natural resources, representing an important cultural reference for the Biosphere Reserve inside the Transition Area.

Barga (9,818 inhabitants, ISTAT 2019) is located in the Province of Lucca, about 36 km north of the capital, and represents the main centre of the historical region of Garfagnana, of which it is also an important secondary school and hospital unit. Although located in the Lucca area, Barga owes its historical development to the Medici, lords of Florence, who ruled these lands from the fourteenth century. In the Renaissance period, between the 15th and 17th centuries, the Municipality flourished under the Grand Duchy of Tuscany, as evidenced by the palaces of that period: Palazzo Pancrazi, Balduini and Bertacchi; It should be noted that even

after the unification of Italy, Barga was an exclave of the Province of Florence until 1927. From a cultural point of view, Barga is strongly linked to the poet Giovanni Pascoli who lived there between 1895 and 1912 in the current hamlet of Castelvecchio Pascoli, which houses the House Museum; on the territory there is the well-known Teatro dei Differenti, inaugurated in 1795, and every year since 1986 the Barga Jazz festival has been held. The Municipality is part of the Cittaslow association (Slow Cities) and is the orange flag of the Italian Touring Club. From a social point of view, the phenomenon of return immigration from the United Kingdom that characterized the second post-war period is interesting. A large number of commercial and industrial activities have flourished in Barga, in particular in the metallurgical, pharmaceutical products and preparations, retail trade and accommodation and catering services sectors. The municipal area is part of the Transition Area of the Reserve, with a narrow strip belonging to the Buffer Area of the ridge, at the SAC IT5120005 "M. Romecchio - M. Rondinaio - Poggione".

Castellarano (15,346 inhabitants, ISTAT 2019) in the Province of Reggio Emilia: The first human settlements date back to 2000 BC. The peoples who settled in succession were: the Terramare, the Liguri Friniati, the Gauls and the Romans. Numerous populations of barbarians also took turns, with important settlements such as that of the Lombards. Numerous archaeological finds date back to the fifties to date: they are kept in the museums of Modena and Reggio Emilia, such as the remains of five Lombard tombs with their funeral furnishings, which together with many others have provided evidence of a reliable historical picture of the prehistory and ancient history of the Castellarano area. In the territory of Castellarano the remains of a fossil whale have been found, probably dating back to the Piacenzian period. The flourishing ceramic industries develop within the so-called ceramics area, outside the Reserve, which, together with the neighbouring municipalities, ranks among the most important industrial centres in the region.

Castelnovo ne' Monti (10,506 inhabitants were recorded in the 2019 Census) is in the Province of Reggio Emilia, at about 44 km from Reggio and it lies at the foot of the Pietra di Bismantova, between the Secchia and Enza valleys and in the Middle Ages it was the seat of an important Lombards gastaldate. Castelnovo ne' Monti is the most important service centre (with high schools, a hospital, and commercial, social and recreational activities) and the economic hub of the mountains in the province of Reggio Emilia, thanks to its central location among the communication routes that connect the Reggio Emilia plain to the ridge of Lunigiana. The commercial tradition of this municipality is represented by the centuries-old Fiera di San Michele. Castelnovo ne 'Monti is also part of the international Slow Cities network. The whole of Castelnovo ne' Monti is included in the Biosphere reserve area. Part of its territory is in a core area (Pietra di Bismantova) and the rest is in buffer zones and transition areas.

Castelnuovo di Garfagnana (5,851 inhabitants, ISTAT 2019) in the Province of Lucca: is the main settlement and the fulcrum of the Garfagnana area. It lies 50 km from Lucca) It is located at the confluence of the River Serchio and the Turrite Secca, one of its main tributaries). It is the administration and business centre of the valley and it provides territorial services such as high schools, a hospital and a wide range of commercial activities. It is also home to the Garfagnana Union of Municipalities. Its beautiful old town centre and surroundings with the Mont'Alfonso castle and its role as a gateway to the Garfagnana have made it an important tourist destination Castelnuovo di Garfagnana is part of the Biosphere Reserve exclusively as Transition

area for the municipal territory that is geologically and culturally linked to the Apennines, while the Apuan Alps area is excluded

Castelvetro di Modena (11,323 inhabitants, ISTAT 2019) in the Province of Modena: inhabited since the Etruscan era, the municipality has a very diversified geographical aspect: from the plain of the northern area of the municipality to the high pre-Apennine hills of the southern area. Monte Tre Croci, about 410 m high, is part of the Municipality of Castelvetro, while the highest point of the whole Municipality is Colle della Guardia (about 450 m above sea level) on which the Sanctuary of the Beata Vergine di Puianello is built. The town of Castelvetro is crossed by the Guerro stream, a tributary of the Panaro, which divides the town in two parts. The municipality suffered a demographic crisis in the post-war period up to the 1970s and then recovered especially from the beginning of the new century. Famous in the early 1900s for the brick industry, one of the first in Italy to have the Hoffmann kiln for the continuous production of bricks and similar products. Agricultural production is concentrated around the vine, with significant productions of Lambrusco Grasparossa, used for the homonymous PDO and Trebbiano wine from which the Traditional Balsamic Vinegar of Modena is also obtained.

Collecchio (14,716 inhabitants, ISTAT 2019) is located in the Province of Parma, 11km south-west of the capital, on the banks of the River Taro. The Municipality has always been located along important communication routes, starting from the upper Middle-Age in which the Via Francigena passed here and the Pieve di San Prospero and San Martino were built. The modern communication routes are the SS62 Statale della Cisa and the Pontremolese railway line (active between Parma and Collecchio since 1882), two of the main connections between the two sides of the Tuscan-Emilian Apennines. The constant demographic growth is certainly to be linked to the presence of numerous companies of all sizes connected mostly to the flourishing agro-food sector: processing industry of cured meats (including PDO Prosciutto di Parma), dairy industry with the production of PDO Parmigiano Reggiano and UHT milk (Parmalat) and the tomato canning industry ("red gold"), so important in the area that a museum has been dedicated to it. Nonetheless, Collecchio represents an important centre from a naturalistic point of view and its territory is crossed by both the Boschi di Carrega Regional Park and the Taro River Park which has its headquarters at the Visitor Centre at the Corte di Giarola and which hosts the 'Le Chiesuole' wildlife area, one of the most important artificial wetlands in Northern Italy, obtained from a gravel pit dismissed in 1998. Precisely by virtue of the territory of the two regional parks, Collecchio is simultaneously included in two Core Areas and in two Buffer Areas as well in the Transition Area which in any case corresponds to most of the municipal area.

Coreglia Antelminelli (5,163 inhabitants, ISTAT 2019) is located in the Province of Lucca, about 35km north of the capital. It is one of the main centres of the historical region of Garfagnana. Within the municipality there are testimonies of Ligurian-Apuan sites of the III-II century BC, in particular the Necropolis of Margeglio in the hamlet of Tereglio. The full name of the municipality was taken only after the unification of Italy, in 1862, paying homage to the Antelminelli, faithful allies of the lords of Lucca, who managed the vicarage and then the county of Coreglia in the Middle Ages; the community's bond with these ancient glories is sealed by the medieval festival which takes place every year in August. The Municipality is known on a cultural and artistic level for having hosted an important community of figurists starting from the 16th-17th century. The creation of plaster items was for a long time the main occupation of the population and was linked to an important migratory phenomenon that affected the entire Middle Serchio Valley; to

provide training to those wishing to emigrate to be figurists, in 1883 cav. Carlo Vanni founded the "School of design and plastic". To keep track of this recent past, starting in 1975 in Coreglia Antelminelli the Museum of the plaster figurine and emigration was created. The municipal area is largely within the Transition Area of the Biosphere Reserve, with a weak ridge strip within the Buffer Area at the SAC IT5120005 "M. Romecchio - M. Rondinaio - Poggione".

Felino (8,983 inhabitants, ISTAT 2019) is located in the Province of Parma, about 15km from the capital. It represents an important service centre of the Parma Pedemontana Union, hosting the Municipal Police and Civil Protection Headquarters, the Social Helpdesk, a Comprehensive Institute (Primary, Lower Secondary School and two Kindergartens), a day centre for the elderly, a cinema theatre, a municipal library and a historical archive; the Municipality has also been proposing an annual program of courses since 2010 in collaboration with the Popular University of Parma. From a historical point of view, the first dated remains of ancient Bronze Age villages (called "terramare") of the province were found on the municipal territory in Monte Leoni (Barbiano) and the importance of the place in medieval times is testified from the Castello di Felino which stands on a hill about a kilometre from the town and dominated the pre-hilly area between the Baganza and Parma streams. However, what makes the town known is the great agricultural and food processing and canning tradition that has favoured its importance as an industrial centre for the processing of meats and sausages. Felino was the oldest salami production centre in the entire Province of Parma and here the PGI Salame Felino is produced, with a sweet taste and delicate aroma. Recently the Salame Museum (which is part of the Museums of taste circuit) has been dedicated to this premium food. The museum is housed in the castle. The municipal area falls entirely within the Transition Area of the Biosphere Reserve

Fiorano Modenese (17064 inhabitants, ISTAT 2019) in the Province of Modena: an important settlement since the Neolithic age, it hosted human activities throughout the Bronze, Iron and Roman Ages. Of particular importance is the "Cultura di Fiorano", flourishing around the sixth century. BC, characterized by some typical ceramic containers including large four-handled jars, flasks, bowls and cups decorated with vertical lines of engraved dots and engraved lines. Following the end of the terramare civilization around 1150 BC, the Modena area is witnessing a strong demographic collapse, despite the survival of small isolated villages. The Villanovan civilization, a direct extension of the Urnfield culture of central Europe, does not appear to cross the Panaro river to the west. Even the Etruscan age saw a limited territorial diffusion, which had its western border in the Torrente Guerro. In this period, the main human activities concerned the breeding of cattle, pigs and goats and sheep as well as a massive production of ceramics. Around 200 BC the infiltration of Gallic populations reached a peak, pushing the Etruscans to the east and south and holding back the Roman advance. With the Romanization of Cisalpine Gaul, the local population of Celtic mother tongue began to learn and speak Latin despite incursions from the mountains by the Friniates continued for decades until their complete submission. Unlike the surrounding territories, the municipal territory underwent Centuriation in Roman times to host farms, production plants and villae. In the Middle Ages the territory hosted a Carolingian court and important fortifications to defend itself from invasions, in particular from the Hungarians. It became part of the possessions of Matilda di Canossa and, on her death, was disputed between the noble families of Della Rosa, Este, Visconti, Gonzaga, Pio di Savoia until the arrival of Napoleon Bonaparte who in 1796 suppressed the Este regency

From an environmental point of view, the territory is home to the "Salse di Nirano", a cold clayey mud mixed with hydrocarbons spewing from the subsoil and building volcanic-looking cones up to a few meters when drying up.

Fivizzano (7.579 inhabitants, ISTAT 2019) in the Province of Massa Carrara, is a Municipality of Lunigiana. It is located 57 km from Massa Carrara. It has always been an important settlement, as demonstrated by the large number of works of art and mansions dating back to the Medici period in particular. Jacopo da Fivizzano opened one of Italy's first printing offices in the town and it was here that the first typewriter was invented and used.; its memory is preserved in the Printing Museum inside the Augustinian Convent. Cultural reference for the Apennine Lunigiana, also due to the demographic decline (from 8249 inhabitants in 2011 to 7730 in 2017, ISTAT data). Fivizzano is included in the Biosphere Reserve for that part of the municipal territory geologically and culturally linked to the Apennines, with the identification of both a Core Area (Cima Bel Fiore) and Buffer and Transition Areas. The municipal areas geologically and culturally related to the Apuan Alps complex are excluded from the Reserve.

Fornovo di Taro (6.007 inhabitants, ISTAT 2019) - Province of Parma; about 25 km from the provincial capital, the Municipality is part of the proposed extension of the Biosphere Reserve, it stands on the banks of the Taro River and houses a portion of the Monte Prinzera Nature Reserve and a limited area of the Regional Park of the Taro River. In the Middle Ages, Fornovo di Taro was a connecting point between the Po Valley and Lunigiana, an important stop along the Via Francigena route, and linked its name to the famous "battle of Fornovo" in 1495 between the army of the Lega Italiana (Italian League) and that of Charles VIII. In recent times this Municipality has been the seat of a very important extractive economic activity, completely anomalous with respect to the territory of the Reserve: the Vallezza hydrocarbon mine represented one of the most important exploited oil fields of the Italian peninsula (it is estimated that during the '30s it supplied 80% of the domestic demand); exploited between 1905 and the end of the 70s of the last century, today it has become the first Petroleum Museum Park in Italy. Finally, Fornovo di Taro stood out in the Second World War so as to deserve the Bronze Medal of Military Valour for the War of Liberation and was the site of the battle of the Sacca di Fornovo. For the Biosphere Reserve, the territory of Fornovo di Taro is one of the most significant as it simultaneously hosts: 2 Core Areas, 3 Buffer Areas and the Transition Area.

Langhirano (10,484 inhabitants, ISTAT 2019) is located in the Province of Parma 22km from the capital. It is considered the capital of PDO Prosciutto di Parma, a "must" of the Italian food tradition in the world, and is home to most of the companies that cure hams and many other thriving companies in the food industry; this factor is certainly the basis of its rapid demographic growth in the last decade (+ 7% inhabitants). The entire municipal area of Langhirano is included in the Biosphere Reserve exclusively as a Transition Area and plays a fundamental role in connecting the hilly area with the Parma plain

Lesignano de' Bagni (5,054 inhabitants, ISTAT 2019) is located in the Province of Parma, about 23km from the capital. The municipality owes part of its name to the presence in the area of sulfuric saline springs, exploited between the fifteenth and the end of the nineteenth century within thermal baths. The territory, which is part of the pre-hilly area of the Emilian Apennines, is entirely part of the Transition Area of the Biosphere Reserve. Nevertheless, it presents geological and naturalistic elements, starting from the geosite of the "Salse di Rivalta", an area of mud volcanoes

which due to the arid environment and the soil rich in salts, hosts an interesting halophyte and thermoxerophilous vegetation protected from the designation of the SAC-SCI IT4020023 "Barboj di Rivalta"; the presence of badlands is also widespread. The Municipality was awarded the Bronze Medal of Military Valour for its contribution to the war of liberation.

Luni (8,387 inhabitants, ISTAT 2019) is the only municipality in the Biosphere Reserve belonging to the Liguria Region and is about 20km from its provincial capital, La Spezia. However, it becomes part of the Biosphere Reserve as it is the Municipality which gives its name and historical-cultural roots to Lunigiana. It unites numerous hamlets that have had a rather complex historical development, changing several "lords" between the medieval period and Risorgimento (e.g. from the Visconti to the Malaspina, from the Medici to the Republic of Genoa). The Municipality of Luni was officially born following a regional referendum in 2017 and nominally replaces the former Municipality of Ortonovo. The choice is naturally linked to the history and importance that these territories had in Roman times under the colony of "Luna", founded in 177 BC. and destined to become an important commercial port on the Ligurian Sea and along the Via Aurelia; the position at the mouth of the Magra river guaranteed the supply of products from the Apennines such as wood and the proximity to the Apuan Alps guaranteed the supply of marble, besides wines and cheeses of local production. The remains of the ancient Roman colony remain in the hamlet of Luni Scavi, protected by the Ministry of Cultural Heritage and Activities and Tourism within the National Archaeological Museum (managed by the Polo Museale of Liguria); the site is known for the conservation of marble, mosaics, frescoes and the well-known amphitheatre. The current economy of the municipality is based on craftsmanship

and wine and oil production with excellent products: PDO Colli di Luni and PGI Liguria di Levante, PDO EVO oil Riviera Ligure. Luni is located entirely in the Transition Area of the Biosphere Reserve, for which it represents an important historical and cultural reference.

Maranello (17,680 inhabitants, ISTAT 2019) in the Province of Modena: Archaeological discoveries document the existence of Maranello at least from the Bronze Age (1800-1000 BC), but numerous finds have also been found from very earlier times, such as the remains of the terramare di Gorzano or the Cumarola necropolis dating back to the Eneolithic period (III millennium BC). There were also settlements of populations of Ligurian extraction (Ligures friniates), subdued between 189 and 179 BC by the Roman legions that were gradually conquering Italy. The confirmation of the Roman presence can be found in one of the main roads that cross the town, the Via Claudia: it was an ancient route, perhaps from the Etruscan era, alternative to a portion of the Via Emilia that was arranged by the consul Claudio, from whom the road took its name. It was an important access point to Frignano, defended for over 500 years by a castle, acquiring importance both for commercial activities along the road and railways, and for tourism. Famous since the Second World War for the Ferrari factories, which were moved here due to the bombing of Modena in 1943 and which subsequently affected the economy of the area and surrounding municipalities.

Marano sul Panaro (5,264 inhabitants, ISTAT 2019) in the Province of Modena: it is a municipality located 26 km from the provincial capital, overlooking the Panaro river, which represents a thriving agricultural-industrial centre and an important cultural and naturalistic reference for the area hills of Modena. The current core has medieval origins and the organization and distribution of churches and villages in the area is linked to this period; the development of the town took place after the Second World War. Among the economic activities: woodworking, precision mechanical industries, plastics, marl for bricks, in addition to the processing of pork for sausages. Most of the territory is of agricultural vocation and is exploited for forage and fruit trees (in particular for the PGI Vignola Cherry). The town was the scene of the Resistance and is sadly known for the Ospitaletto massacre, to which a Commemorative Park has been dedicated. From a cultural point of view, it is a lively town that hosts museums (Museum of Ecology and Natural History; Museum of Energy) and important events, including the "National and European Festival of Children's Theatre" now in its 35th edition. In the municipal area there are also the Fluvial Park of the Panaro river, the Festà wildlife park, the Parco delle Cince. From the point of view of the Biosphere Reserve, Marano sul Panaro falls largely within the Transition Area, but also includes a portion of the Buffer Area belonging to the Sassi di Roccamalatina Regional Park, on the border with the Municipality of Guiglia. Being the last municipality on the plain and the first on the hills in the Modena area, Marano sul Panaro is known as the "gateway to the Apennines"; this symbolic recognition could have a logistical development for the Reserve as through the ecotourism "Nature Path", the Municipality is directly connected to the city of Modena.

Medesano (10,884 inhabitants, ISTAT 2019) is located in the Province of Parma, about 18km from the capital. The Municipality is located in the pre-hilly area of the Parma Apennines on the left bank of the River Taro. Its position has always been strategic to control access to the Val di Taro and historic communication routes through the Apennines. For this reason, there are numerous traces of its past, starting with Terramare sites of the Bronze Age, passing through Roman remains and on to the numerous ruins of medieval castles and churches scattered throughout the municipal area. Medesano was crossed by the Via Francigena, a stop on

the itinerary of Sigeric, archbishop of Canterbury, who passed here in the year 990. As to the Biosphere Reserve, Medesano hosts part of the Core Area coinciding with the Taro River Regional Park, quickly passing to the corresponding Buffer Area and then to the Transition Area which affects only the portion of the valley floor of the Val di Taro. Within the municipal area numerous abandoned quarries have been renovated and now forming artificial lakes to expand and safeguard biodiversity within the Taro River Park (the "Laghetti di Medesano") and for recreational purposes ("Lago di Medesano", at the former Gescat quarry)

Noceto (13,033 inhabitants, ISTAT 2019) is located in the Province of Parma, about 13km from the capital, on the left bank of the Taro River. The Municipality is located at the intersection of two important ancient and modern communication routes, the Via Emilia and the SP 357 della Cisa. This is one of the reasons that made Noceto important in the past and in the present. From the historical point of view Noceto hosts one of the most important archaeological sites of the terramare civilization - the Votive Tank, the oldest (15th century BC) and largest (70sqm and over 4m deep) pre-protohistoric European wooden structure of the Bronze age, discovered in 2004 now exhibited in the archaeological museum. Other important historical sites are the medieval ones scattered throughout the territory: the Rocca Sanvitale di Noceto (or Castello di Noceto), whose nucleus dates back to the 13th century and which despite several renovations over time, still houses a garden belonging to its original structure. This castle, which since 2005 has been renamed as "Castle of Music", plays today an important social role by hosting both the "R. Scrollavezza " museum of Liuteria (Stringed Instruments Making) and the International School of Liuteria (Stringed Instruments Making), as well as the" B. Slawitz " disk museum. The Municipality of Noceto can ideally be divided into four citadels: the sports citadel which houses football, five-a-side football, rugby and tennis facilities, the swimming pool, the gym and sports hall with a bowling green; the education citadel housing an education facility with the kindergarten, primary and lower secondary school; the culture citadel which houses the Biagio Pelacani Cultural Centre with a theatre, library, the Museum of Typography and the aforementioned archaeological museum; the welfare citadel with its sheltered housing system and outpatient clinics. The territory of Noceto hosts the northern portion of the Taro River Regional Park and, as to the Biosphere Reserve, it hosts part of the relevant Core Area, the Buffer Area and finally the Transition Area which extends for a few km on the valley including the centre of the town. It is also important to mention the important Golden Flag award from the Council of Europe received by the Municipality in 2002, for the important activity of promoting the principles that underlie the European Union.

Parma (196,518 inhabitants, ISTAT 2019), the provincial capital, is the second most populous city in Emilia-Romagna. Naturally, the city is the cultural and service centre of the entire province, as evidenced by the large number of schools (51 kindergartens, 36 primary schools, 20 lower secondary schools and 33 upper secondary schools - high schools, technical and professional schools) and the presence of an ancient and important University with its 9 departments (Social Sciences and Humanities; Law, Political and international studies; Engineering and Architecture; Medicine and surgery; Food and pharmaceutical sciences ; Chemical, life and environmental sustainability sciences; Economic and business sciences; Mathematical, physical and computer sciences; Medical-veterinary sciences) and its own university campus. Man has been present in this area since the Neolithic period but the first settlements are to be referred to the Bronze Age, in particular to the terramare civilization which from the 16th century BC. spread in the Parma area (see above, Noceto and Felino). The region was occupied by the Etruscans, by

the Gauls and finally by the Romans who made Parma a colony in 183 BC. and led to its first development as a junction between the Via Emilia and the direct routes to Luni and Lucca. Between the fall of the Western Roman Empire and the Renaissance period, Parma goes through a complex historical period: it was for several times the land of conquest of the barbarians, then it passes through ruling by counts-bishops, experiences of free municipality (it will be part of the Lombard League), the opposition to the forces of the Holy Roman Empire, the internal struggles between Guelphs and Ghibellines. Despite this it also experiences moments of important development during the short Byzantine period, in which it will be defined "Chrysopolis" (city of gold) and during the eleventh century in which it is certified as the seat of an important university centre that attracts students from Italy and beyond the Alps. The strongest development in the city, however, only took place starting with the establishment of the Duchy of Parma which was governed first by the Farnese family and then by the Bourbons-Parma who ruled almost continuously between 1454 and 1859. In the twentieth century, the city stands out during the partisan resistance and the Municipality is awarded the Gold Medal of Military Valour. The rich cultural centre of Parma can boast important medieval architectural beauties, such as the Duomo (Cathedral of Santa Maria Assunta) and the Baptistery, Renaissance monuments like the pentagonal fortress of the Citadel (which now houses a large public park) and the Palazzo della Pilotta, and later on some other ones such as the large Parco Ducale, beyond the Parma stream. The city is also famous for its relations with numerous famous artists: it is essential to mention the Renaissance Mannerist painters Correggio (who painted for example the domes of the Cathedral and the Church of San Giovanni Evangelista) and Parmigianino, the composer Giuseppe Verdi and the conductor Arturo Toscanini; the city was also at the centre of one of the most famous novels of the French writer Stendhal, "The Charterhouse of Parma". The cultural link with music and art in general is still present through the network of museums and events held in the municipality. Among the city museums the most important are: the National Gallery, the National Archaeological Museum, the Academy of Fine Arts housed in the Palazzo della Pilotta, but also the House of Music (Casa della Musica) and Opera Museum and the Birthplace of Arturo Toscanini. Among the events, the Verdi Festival certainly stands out, an important opera event of international appeal now in its twenty-first edition, which largely takes place at the Teatro Regio in Parma (the main of the city). Parma was also designated the Italian City of Culture for the year 2020 by MiBACT. From an economic point of view, Parma shows a strong manufacturing fabric (where the food industry plays an important role) and important commercial activities (in particular retail) which are flanked by numerous service companies; the high number of employees in catering services exceeds the number of workers in the construction industry while the role of financial activities is significant (the city is home to an important bank, Crédit Agricole Italia SpA, formerly the Cassa di Risparmio di Parma and Piacenza or "Cariparma", founded in 1860). The food industry for Parma is a cultural foundation rather than an economic sector: unique products such as PDO Parmigiano Reggiano , PDO Prosciutto di Parma and the PGI Coppa di Parma link the name of the city to products of centuries-old traditions appreciated all over the world. Countless quality products and traditional dishes from all over the provincial territory are also to be mentioned. Parma was chosen in 2003 as the seat of the EFSA (European Food Safety Authority) and in 2007 as the seat of the Italian Consortium for Food Safety and Research; Food Sciences represent a study department of the Parma University and Parma was also designated as a Creative City for Gastronomy by UNESCO in 2015. Speaking of the Biosphere Reserve, the Municipality of Parma has an important connection with the Apennines through

the ecological corridors of its waterways along which it intends to develop soft mobility infrastructures: the Parma stream that runs through its centre; the Baganza, tributary of the Parma, running south of the historic centre; the Taro River that borders the Municipality to the west, bringing into the territory part of the Core Area and the Buffer Area connected to the Taro River Regional Park. For the Reserve, the city represents the connection with the main communication routes of the plain, not only through the SS9, the historic "Via Emilia", the SS62 of the Cisa Pass, the A15 Parma-La Spezia and A1 Milan-Bologna motorways, the local and national railway network, the "G. Verdi" airport. The solid international relations enjoyed by the city (for example the numerous twinnings including that with the Slovenian capital, Ljubljana, and the presence of honorary consulates of France, Bulgaria and Lithuania) will play an important role in the development of the Reserve. The policies adopted by the city in terms of sustainable mobility (it has adopted its own Urban Plan for Sustainable Mobility and has a vast cycle network that already connects it to the hilly area of the Apennines), its adherence to the Pact of Mayors and the presentation of its candidacy as European Green Capital for 2022 are choices that enrich the value of the Biosphere Reserve

Pavullo nel Frignano (18,046 inhabitants, ISTAT 2019) - Province of Modena: Pavullo is located in the centre of a plateau that acts as a watershed between the valleys of the Panaro and Secchia rivers. The name Pavullo derives from paule or "swamp", the swamp near which it once stood and which is still visible in a small part at the edge of the town to the south. The name Frignano, on the other hand, derives from the ancient inhabitants, the pre-Romans Ligurian Friniati, a population already mentioned in these pages that occupied a much larger territory than the current one and constituted the extreme eastern offshoot of the Ligurians north of the Apennine ridge. Pavullo was the main Roman fortress of the Modena Apennines: the military camp stood on the Via Claudia Augusta leading from Pisa to the Danube and close to the Via Bibulca. In the twelfth, thirteenth and fourteenth centuries, the organization of the parish churches, where the civil organization of the territory coincided with the religious one, replaced the military organization. The administrative centre of the entire Lower and Middle Frignano territory was for many centuries, at least until the 15th century, the Castle of Montecuccolo. In recent times, the central role of this area was the drive of the development of the area, through the numerous roads that connected Emilia to Tuscany. Among these, of particular importance were Via Vandelli and Via Giardini, which merged into the state road that connects central Italy to Austria and Germany through the Brennero and Abetone passes.

It is therefore called "del Frignano" the Modena mountain community sharing a cultural homogeneity linked to its past as a borderland between Romans and Celts, between Byzantines and Lombards, between Emilia and Tuscany based on common customs, traditions and habits. The town of Pavullo, at the centre of this community, is of great importance for the numerous historical attractions of its territory which are combined with the important environmental values. It is worth mentioning the Sassoguidano Reserve, for its high biological diversity, resulting from an articulated composition of habitats sometimes influenced by historically consolidated human activities and in balanced relationship with the environment and for its geodiversity connected with karst geomorphology and surface hydrogeology that has shaped the edges of the plateau originating from the same rock that makes up the Pietra di Bismantova. The biodiversity of the area is not only limited to the nature reserve, but also finds places of particular interest within the town. In particular, the park of the Palazzo Ducale, built in the

nineteenth century and described in detail in chapter 16. Among the various native and exotic botanical species present in this park and in the botanical garden managed by the University of Modena and Reggio Emilia, a cedar of Lebanon of imposing dimensions, nicknamed the Pinone, stands out and together with the Montecuccolo Castle, is the symbol of the town. The link between man and nature is also evident in the agricultural vocation that this territory has had over the centuries and in the food and wine tradition that has ensued from it, which has influenced the whole Modena Apennine side with typical products such as crescentine or borlenghi (traditional types of bread).

Pontremoli (7,182 inhabitants, ISTAT 2019) - Province of Massa Carrara: Pontremoli is the northernmost municipality of the Tuscany Region, nestled in the upper valley of the Magra river, at the confluence with the Verde steam and the Valle del Verde, at the northern - western part of the historical region known as Lunigiana. The first human settlements date back to the first millennium BC; finding of ancient anthropomorphic megalithic remains, scattered more or less throughout the Lunigiana and better known as "stele statues" - now housed in the Museum of Lunigianesi Stele Statues overlooking the Piagnaro Castle - testify to the presence of inhabited nuclei at least until the arrival of the Etruscans, around the 7th century BC. This part of the territory was a place of mixing between Etruscans and native tribes. Some historical interpretations identify Pontremoli as the place where the ancient Apua, capital of the Apuan Ligurians, was built. Defeated by the Romans in the 2nd century BC, the Apuans were deported en masse but a group managed to settle between these hills and these valleys, remaining there. As evidence of Roman civilization, the recent discovery of the Luni-Parma connection road defined by archaeologists as the "Cisa Romana". In the Middle Ages, the village was under the Lombards domination and grew considerably, in relation to the ancient Via Francigena of pilgrimage to Rome. The strategic location as a connection area (Cisa axis) between the Apennine chain, the Tyrrhenian Sea, Tuscany and the Po Valley made Pontremoli the target of numerous disputes by Italian or foreign Lordships, which characterized the rest of the Middle Ages and which lasted on and off until the modern age. Today, the Municipality is located on the road, motorway and railway axes of the Cisa and is characterized by a high school centre, hospital and a thriving agro-food and tourism sector, besides specialized manufacturers in the furniture sector. Pontremoli, which completes an identity unit with the other Municipalities of Lunigiana, is a culturally important centre (also being home to the "Bancarella" literary prize) and falls almost entirely within the Transition Area, with a small portion of the Buffer Area belonging to the Apennine ridge

Quattro Castella (13,169 inhabitants, ISTAT 2019) is located in the Province of Reggio Emilia about 16 km from the capital. Most of the municipality is located in a foothill area at altitudes between about 150 and 400 m. The town takes its name from four castles that rise on four hills and lived its splendour in the Matilda's times. Starting from the east, the castles of Monte Vetro, Bianello, Monte Lucio and Monte Zane can be admired. These fortifications were probably part of the northern defensive system of the Canossa domains. With the exception of the Castle of Bianello, which stands almost intact, only a few ruins remain of the other castles. The history of these places has much more ancient origins and the archaeological discoveries attest to a presence that from the Palaeolithic area had continuity up to Roman times. The municipality is home to the Bianello Oasis, a protected wildlife area characterized by valuable woods and forest often affected by gully erosion housing many valuable plant and animal species. From the point of view of the Biosphere Reserve, Quattro Castella is entirely located within the Transition area

Reggio nell'Emilia (171,999 inhabitants, ISTAT 2019), the provincial capital. It was founded by the Roman consul Marco Emilio Lepido as a garrison and defence along the strategic communication route between Rimini and Piacenza, still known today as Via Emilia. In complex medieval and Renaissance vicissitudes, was mostly under the rule of the Este family and the city centre with hexagonal base reflects the architecture of this historical period. During the war of liberation, Reggio nell'Emilia was an important centre of the partisan resistance (the Fratelli Cervi partisans) and for this reason it obtained the Gold Medal of military valour. The city is known throughout the country as the "City of the Tricolore (Italian Flag)", created here and exhibited for the first time on 7 January 1797 as the flag of the Cispadana Republic. Reggio nell'Emilia is a significant cultural and service centre. In the Municipality there are as many as 21 secondary school institutes including high schools, technical institutes and professional institutes; the city also hosts the headquarters of the departments of Communication and Economics, Education and Human Sciences, Life Sciences, Sciences and Engineering Methods of the University of Modena and Reggio Emilia (UniMORE). Important Civic Museums and Galleries: Archeology Collection, Ethnography Collection, Art Gallery, Natural History Collections (of particular value is the one that the scientist Lazzaro Spallanzani donated to the city), City History Collections and the Tricolore Museum. Among the cultural events of considerable interest: Fotografia Europea, an international cultural festival of contemporary photography. The city is also well known and internationally recognized as a City of Education for the so-called Reggio Emilia Approach, an educational philosophy and pedagogical approach for the Municipality's preschools. The Reggio Children Foundation (former partner of the Reserve) operates in the area with the well-known Loris Malaguzzi International Centre. Reggio nell'Emilia has always developed a dense network of international relations in this and other fields, which it also maintains in the form of exchanges and twinning with cities and foreign countries. The social fabric has a high percentage of foreign citizens (16.4%) involved in the shared integration paths promoted by the MONDINSIEME Intercultural Centre, set up by the Municipality in 2010, which brings together category associations and public and private stakeholders. From an economic point of view, the manufacturing sector (fashion and mechatronics) is flourishing. The city of Reggio Emilia, from the very first candidature, expressed its endorsement to the Tuscan-Emilian Apennine Biosphere Reserve; now the presence of the Municipality of Reggio nell'Emilia within the Transition Area of the Biosphere Reserve represents an important opportunity as part of an integrated urban-mountain sustainable development program of which the Municipality of Reggio Emilia is a candidate to be incubators and laboratory. The provincial capital has the opportunity to strengthen relations with its internal areas in the Apennine region, developing shared mobility and sustainability projects and using the Crostolo stream to create an ecological corridor that connects the plain to the mountains. The Reserve has the opportunity to enrich itself with the city for its solid international relations, for the strategic position that makes it a privileged gateway to the Apennines thanks for example to the location on the historical-religious road Matidilica del Volto Santo (Mantua Lucca) and the Reggio Emilia Medio Padana high-speed train station, but also its good practices and projects for sustainable development, respect for the environment and the fight against climate change; from this point of view it is significant that the Municipality has adopted its own Urban Sustainable Mobility Plan, participates as leader in the European PROSPERA Interreg Project, has developed the Urban Gardens and Agriculture Project and has adopted an Urban Forestry Plan which provides for the planting of 50,000 trees in 5 years.

Sala Baganza (5,679 inhabitants, ISTAT 2019) - Province of Parma; about 12 km from the provincial capital, it stands on the left bank of the Baganza stream and represents a municipality where small and medium-sized enterprises are concentrated ranging from the engineering sector to the agro-food sector (in particular linked to PDO Prosciutto di Parma and Parmigiano Reggiano). The territory is part of the proposed expansion of the Biosphere Reserve and brings with it important elements both from a naturalistic, cultural and architectural point of view. The Regional Park of the Boschi di Carrega (Parks of the Duchy) is located in the Municipality of Sala Baganza, within which the famous villa Casino dei Boschi is located, built between 1775 and 1789 by the Duchess Maria Amalia di Borbone ; this important naturalistic area is enhanced by the Biosphere Reserve within a Core Area. In the town centre, on the other hand, there is the Rocca di Sanvitale, which belonged to the noble family of Sanvitale between the thirteenth and seventeenth centuries before passing to the Farnese family, and the "Giardino dei Melograni- Pomegranate garden " known for its interesting eighteenth-century architectural structure, recently restored. From a logistical and strategic point of view, Sala Baganza also offers the Biosphere Reserve an important "slow" connection to the city of Parma through the existing network of cycle paths.

Sassuolo (40,918 inhabitants, ISTAT 2019) in the Province of Modena: there are various hypotheses regarding the origin of the name, but the most authoritative for historians are two: according to the first, the name originates from the oil that has abounded since ancient times naturally in the area, called at the time "olio di sasso - stone oil", while for the second hypothesis the name would derive from the Latin saxum solum (hence Saxolum), or "stony ground", and would indicate the precise place where the first settlements would have taken place humans in the area. Natural resources have therefore always been a cornerstone of this settlement, both for the presence of hydrocarbons and clays that emerge along the gullies and have been the object of a thriving ceramic industry for millennia. It shares with the other territories of the Modena area an articulated history since the Bronze Age, as a place of meeting and clash between populations of various origins: Terramare, Liguri Friniati, Liguri Apuani, Galli Boi, Romans, Lombards and numerous lordships alternated up to unification of Italy in 1860. With the advent of the railway the territory underwent a demographic boom practically uninterrupted up to the present day. Since 1700 the city has been famous, even internationally, for the production of ceramic tiles; here and in the neighbouring municipalities the main Italian tile producers have their headquarters or production and research plants. The territory produces both typical local specialties (aniseed liqueur, the "tiramolla" - typically Easter caramelized sugar) and products from the Modena and Reggio area (nocino, fried gnocco, crescentine, bensone, tortellini, zampone and cotechino, parmigiano reggiano, erbazzone). Tourism is mainly concentrated towards the Apennine slopes, slow roads such as the Nature Route along the Secchia river and the Via dei vulcani di fango which connects the main inhabited centres with the attractive areas of the Salse, in particular in addition to those already mentioned in Nirano in the municipality of Fiorano, in the Montegibbio area - also mentioned by Pliny the Elder in his Naturalis historia

Serramazzoni (8,430 inhabitants, ISTAT 2019) in the Province of Modena: The municipal area shares the history of the territories of the lower Modena Apennines: a place of crossing and encounter-clash between populations since prehistoric times due to its location along the roads leading to the Apennine passes (in particular Abetone); it hosts some significant

natural and historical attractions such as some castles, the Bucamante and Rio delle Borre waterfalls, the Salse della Cintora. The town houses the museum of the historic roses.

10.3. CULTURAL SIGNIFICANCE

An ongoing, age-old interrelationship between humans and the territory has produced the unique, distinctive cultural qualities of the area of the Apennino Tosco-Emiliano Reserve.

The Tuscan-Emilian Apennines are the cornerstone supporting the entire territorial system. Ancient peoples such as the Ligurians, the Apuani, the Frignati and the Etruscans chose to settle here and it was a hard-fought battleground during the expansion of Rome; It was ruled by the Byzantines, the Lombards and the Carolingians. It was subsequently at the geographical heart of the Canossa possessions which provided the physical and emblematic setting and background for the conflict between the Empire, the Papacy and Tuscany (or in modern terms between political and religious powers) at the time of Matilda of Canossa. The seigneurial Malaspina, Medici and Este families fought over the territory and ruled significant parts of it at different times, leaving traces that are still clear today. Christianity has been the element that has left the most continuous, profound and widespread mark of spirituality, culture and civilisation in the last two millennia. The Pietra di Bismantova was mentioned by Dante Alighieri in the Divine Comedy – the poem that established the Italian language – and it is possible to see how its features served as the inspiration for the Mountain of Purgatory. The works of Ariosto, Pascoli and Bertolucci too clearly refer to and are inspired by these areas of the Apennines.

The Apennines were once impracticable for much of the year, but their woods, pastures and water supplies provided the communities that settled on their slopes with essential natural resources. The areas at lower altitudes have been inhabited since prehistoric times. Today, numerous archaeological finds help to reveal the history of the Apennine peoples. Below are details of some of the most significant discoveries:

- The Stele Statues of Lunigiana or Anthropomorphic Stelae, which are important relics of prehistoric and protohistoric societies that were present in the area from the 3rd millennium B.C. until the 6th century

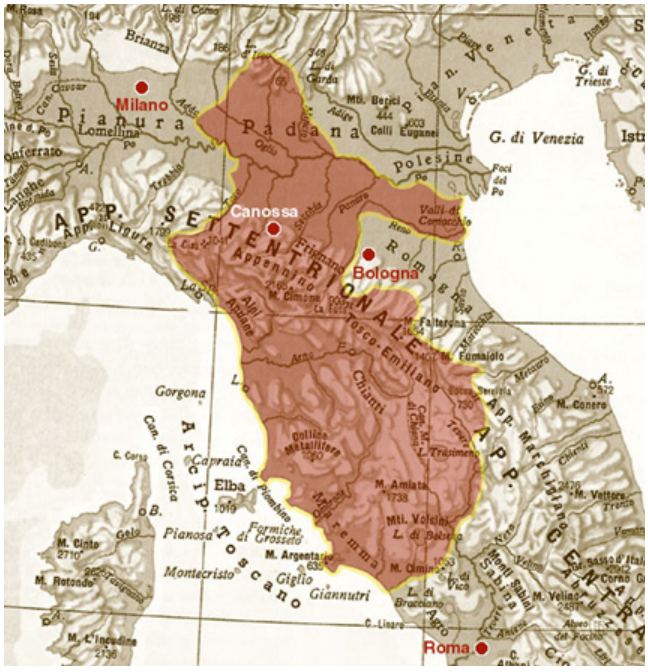


Figure 10.1 The Lands of Matilda from Canossa

B.C. The purpose of the statues is not entirely clear, but they were used by worshippers in some way. They are often found in large valleys linking different areas and mountainous sites near important communication routes between vast regions of Europe. There is a Museum of Stele Statues in Pontremoli (Massa and Carrara);

- The Campo Pianelli archaeological area on the Pietra di Bismantova (Castelnovo ne' Monti), where there was a Copper Age settlement (3rd millennium B.C.). Terramare villages were later built on it and subsequently a sizeable necropolis was added, leaving important finds for archaeologists. Finally, Etruscans and Ligurians settled in the area.
- A prehistoric village on Monte Valestra (Carpineti);
- The terramare site in Monte Leoni (Felino);
- The Noceto Votive Tank from the 15th century BC, the largest pre-protohistoric European wooden structure of the Bronze Age, linked to the terramare civilization, discovered in 2004 and now protected in an archaeological museum;
- A Ligurian settlement dating back to the 4th century B.C. on Monte Pisone (San Romano in Garfagnana) and one in the "Castelliere di Fragno" area (Calestano);
- The Necropolis of Margeglio in the hamlet of Tereglio (Coreglia Antelminelli) attributed to Ligurian-Apuan tribes of the III-II century BC;
- Traces of an Early Iron Age settlement and a Late Iron Age village founded by Romans and barbarians respectively in Codiponte and Luscignano (Casola in Lunigiana);

Figure 10.2 – Verrucole Fortress

- The Lunigiana Park of Rock Engravings in the Municipality of Filattiera, where there are cup marks and engraved boulders, like those that can be seen in Bagnone (Macigno della Grande Madre di Jera), Corniglio and Alpe di Succiso in the Province of Reggio Emilia (Coppella della Sorgente).
- The Luceria area, an ancient settlement in the Val d'Enza (Canossa) where a long stretch of paved and partly porticoed road has been found. It has been identified as the main street which ran through the town parallel to the Val d'Enza and connected the Via Aemilia with the Roman colonies of Lucca and Luni;
- Cisa Romana with the excavations of Sella Valoria (Roman road between Parma and Luni);
- The ancient Roman colony of Luni, including the amphitheatre and the important mosaics as well as the numerous artifacts preserved at the National Archaeological Museum of the city;
- A necropolis from Roman times in San Bartolomeo, along the River Secchia (Villa Minozzo);
- Murella: a site in the Municipality of Castelnuovo di Garfagnana where traces have been found from Etruscan times (6th to 5th century B.C.).
- Along the Versurone stream in the Municipality of Fiumalbo there are some Celtic huts, characteristic buildings with straw roofs with characteristic battlements
- The widespread archaeological area of the Modena Apennines (Municipalities of Lama Mocogno, Marano sul Panaro, Montese) evidencing ancient relations between Ligurians and Etruscans in a relationship of integration and mutual benefit, as well as a subsequent and articulated Roman stay.
- Monte Cimone, a probable high-altitude cult site from the protohistoric age

Recent archaeological studies have highlighted the importance of the role that the Roman routes and the Romanization of the Apennines had in the entire history of the Biosphere Reserve area. Probably, in Roman times these lands had already become a strategic passage between Europe and the Mediterranean and a very particular culture had been established; Romans also introduced the identity crops of chestnut and Spelt of Garfagnana. The Parma-Lucca and Parma-Luni Roman roads are today at the centre of a sustainable tourism project within the Action Plan of the Reserve; it should be emphasized that the extension of the territory of the Reserve effectively allows the entire Roman communication routes to be recreated in the triangle between Parma Luni and Lucca.

The settlement patterns in the territory of the Reserve have crucial historical roots in the era of Matilda of Canossa. The powerful ruler with Lombard origins was part of the imperial family. She was very close to Pope Gregory VII and was named the "Imperial Vicar Vice-Queen of Italy". In 1076, she came into possession of a vast realm that included Lombardy, Emilia, Romagna and Tuscany. Canossa was its political centre. Matilda strengthened the existing defences and had fortresses, towers, fortified villages, parish churches and hospitals built, thus establishing a very prominent and formidable territorial control and defence system. The network of fortifications is still plain to see in the territory and it included the Canossa, Rossena, Carpineti, Sarzano and Bismantova castles (the last of which is now lost). It should be noted that the castle of Bianello, in the heart of Quattro Castella, was the favourite residence of Matilda of Canossa. The network of fortifications is still clearly visible on the territory and therefore of great cultural and tourist appeal. The churches and hospitals also played a part in the

management of the territory: they embodied the religious side of Matilda's power and helped to support and control communication routes. Significant examples include: Vallombrosana Abbey in San Michele Cavana (Lesignano de' Bagni), the churches of Sasso, Bazzano and Scurano (Neviano degli Arduini), San Vitale (Carpineti), and Toano and Paullo (Casina); the hospital in the Ospedalaccio Pass; and the Benedictine Abbey and the San Geminiano hospital in the legendary Romanesca Wood among the San Geminiano meadows, both of which were in Frassinoro on the Via Bibulca, which connected Modena and Lucca through the Passo delle Radici. This network of structures can be seen today along the Via Matildica del Volto Santo (http://www.viamatildica.it/), an eco-tourist itinerary of national importance and subject to enhancement and recovery projects, based on three historical sections (Via del Preziosissimo Sangue, Cammino di San Pellegrino and Via del Volto Santo)

Matilda played a leading role alongside Gregory VII, Henry IV and Henry V in the bitter conflict and the relations between the Holy Roman Empire and the Papacy (basically between politics and religion in Europe - The humiliation and absolution of the emperor in Canossa on 27 January 1077 is an extremely famous historical event), It is widely acknowledged that Matilda's rule played a fundamental part in the creation of the landscape and cultural identity of much of the territory in the Reserve, between Lucca and the Po Valley. The heritage from that era can still be clearly seen today in the landscape of the hills and mountains, as well as in the architectural and cultural legacy protected for example within the Protected

- *Figure 10.3 – PDO Prosciutto di Parma*

Natural and Semi-natural Landscape of Reggio Hills – Lands of Matilda (Paesaggio Naturale e Seminaturale Protetto Collina Reggiana – Terre di Matilde) Body for the Management of Parks and Biodiversity of Central Emilia.

The Middle Ages is therefore a greatly evocative period, which even today still fascinates the resident populations, who recognize the origin of their cultural identity also in an intangible heritage made up of customs and traditions that are nowadays recalled through: historical re-enactments and dedicated weeks in Canossa, Frassinoro, Quattro Castella, Palanzano, Vetto), artistic crafts (the so-called Ars Canusina, developed and promoted until recently in the Municipality of Casina through a public-private consortium), typical gastronomic products, as well as unique and original forms of rural and folk art and theatre as is undoubtedly "il Maggio" (the dramatic May, an epic form of folk theatre), still represented on the territory (chapter 15).

The late Medieval Lordships and Renaissance left the imprint of the often conflicting presences of the Malaspina, the Estensi, the Sanvitale, the Rossi, the Farnese and the Medici, with fortresses, castles (such as the Castle of Verrucola, Comano, Malaspina in Filattiera, of Fosdinovo, Felino, Noceto and the Rocca di Ceserana in the territory of Fosciandora), imposing fortifications (such as the Mont'Alfonso Fortress, the Verrucole Fortress and the Brunella Fortress), the old towns of Fivizzano (where the first books with type characters were printed around 1470 and now home to the Fivizzano Museum of Printing) and Castelnuovo di Garfagnana with its Rocca Ariostesca (as a matter of fact the poet Ludovico Ariosto stayed there as governor of Garfagnana, at the time of the final draft of "the Orlando Furioso" –The Frenzy of Orlando), the art (the 14th-century painter Pietro da Talada, also known as the Master of Borsigliana; the painters Correggio and Parmigianino in Parma). Also, in the portion of the Reserve around Modena numerous traces of the late medieval period can be found, such as strongholds, towers and castles (Sestola, Marano su Panaro, Fanano, Fiumalbo, Montecreto, Montese, Guiglia, Castelvetro, Sassuolo, Maranello, Serramazzoni and Pievepelago where the remains of Roccapelago arise). Several minor rural villages of medieval origin, which still retain their original urban structure, are scattered throughout the territory of the Biosphere Reserve and in the areas involved in the extension proposal.

Traditional food is another varied but unifying element for the territory in the Reserve: many production systems with rural origins are well established on both sides of the Apennines (such as the chestnut industry and sheep's milk-based dairy production) and they are now protected and promoted. Culinary specialities with roots dating back to the Middle Ages are showcased in highly popular cultural and entertainment initiatives such as "La tavola di Bisanzio" (a cultural event of very ancient origin, a banquet in which lamb and mutton dishes are mainly served; it is in fact a feast, just in the manner of Dante's Convivio, an opportunity for dialogue and collection of experiences and testimonies, a sort of "convivial round table" of flavours and knowledge) near Baiso and Carpineti. There are numerous culinary traditions, some of which vary with the climate. For example, butter tends to be favoured on one side of the Apennines and oil on the other.

The DPO Parmigiano-Reggiano cheese that we know today was first made in the lower foothills on the northern side of the Apennines. It appeared in the Late Middle Ages (12th century) and it was probably produced in civil/religious establishments of solid economic and cultural standing that were capable of providing sufficient production space and waiting the long periods required for the cheese to mature. The specific characteristics of the obtained product (a hard cheese capable of lasting over time) which used to be dry salted with the fine salt that was taken from the areas of

Salsomaggiore (a fossil salt – brominated, iodinated sodium chloride – defined "sweet salt" for its peculiar characteristics and deriving from Miocene geologic units), allowed it to be exported since ancient times outside its production area, therefore becoming highly renowned and coveted. The Parmigiano Reggiano PDO is still produced without additives as in the Middle Ages and is today among the most known cheeses all over the world.

Another highly emblematic product is Prosciutto di Parma P.D.O., whose origins lie in Roman times. The production zone is largely concentrated in Val Parma. Its boundaries are marked to the East by the River Enza and the West by the Stirone stream and it only extends 5 km to the South of the Via Aemilia, stopping below 900 metres in altitude. Nonetheless, the great focus on preserving the artisan qualities of the product (which have been threatened by modern industrialisation processes in the food and agriculture business) has made it a renowned Italian delicacy all over the world and it epitomises the propensity to evolve while staying true to tradition that can be found throughout the proposed Reserve. The ham is praised and described in the "Parma Cured Meat and Ham Museum" in Langhirano, which is part of the Parma Food Museums network. Another similarly representative product is the Prosciutto di Modena PDO. It is produced in the area that, starting from the foothills, stretches over the hilly belt and the valleys that develop around the orographic and catchment basin of the Panaro river without exceeding the altitude of 900 meters above sea level and that includes the Modena area and also the territories of the provinces of Bologna and Reggio Emilia. These cured meats too in ancient times was salted by using the salt of Salsomaggiore.

The traditional production of balsamic vinegar of the Modena and Reggio Emilia municipalities included in the Reserve are also worthy of note: Traditional balsamic vinegar of Modena (P.D.O.), Traditional balsamic vinegar of Reggio Emilia (P.D.O.) and Balsamic vinegar of Modena (P.G.I.).

The Balsamic Vinegar of Modena (P.G.I.) probably has its origins in Roman times and its production was documented starting from the beginning of the year one thousand. Derived from the cooking of must from different grapes, the balsamic vinegar was particularly appreciated in medieval times, where it was destined for the tables of noble and wealthy families and from where it was made known to the most illustrious members of the aristocracy through exchanges and rewards throughout Europe. In modern times, production has increased but the processing methods uphold the tradition. The main ingredient is cooked grape must, with blends belonging to the P.D.O. vineyards of the provinces of Modena and Reggio Emilia. The chemistry of the soil and the chemical processes involved in processing play a major role together with maturation (which lasts about 10 years) and aging (which lasts at least another 2 years). Overall the product must go through at least 12 years of process to be able to be identified as "traditional", but it is interesting to note that there is no aging limit and that the suitable environment for the process must be able to benefit from the temperatures and environmental conditions typical of the seasonal evolution of the this area (cold winters and hot summers). Moreover, very precious wooden barrels (chestnut, oak, mulberry, cherry, juniper, ash and locust) also play a fundamental role by allowing the final product to acquire unparalleled and unique aromatic characteristics.

The hills overlooking on the Emilian side of the Biosphere Reserve are also the land of origin of the Lambrusco DOCG which has its main centre in the municipalities of Castelvetro, Quattro Castella (Puianello) and Collecchio (Monte delle Vigne).

Road networks played a key role in the historical development of settlements in the proposed Reserve. Ever since prehistoric times, and especially with the terramare culture, people have tended to settle in naturally defended strategic locations along the travelling routes associated with the courses of rivers. The shape of the Apennines meant that these routes linked the basins of the Secchia, Enza and Taro Rivers to the North – through the Predarena, Cerreto, Ospedalaccio and Lagastrello passes respectively – with the trails along the river basins of the Garfagnana and Lunigiana areas to the South, as far as the mouths of the Serchio and the Magra in the sea. These routes were consolidated during the era of Etruscan colonisation, which penetrated as far as the minor valleys and boosted trade between the two different sides of the Apennines. They became even more established during Roman colonisation, because they provided relatively quick connections between the colonies in the Po Valley and the naval bases on the Tyrrhenian Sea. As they oversaw the communication routes, they were able to control the transit of people and goods. In more modern times (but already in ancient times) the crossable passes, in addition to those mentioned, that cross the ridge are: the Abetone Pass, the Passo Foce a Giovo, the Passo di Cirone, the Passo del Vestito, ans the Passo della Cisa.

The local people endured and played an active part in the era-defining events towards the end of the Second World War. After the Allies landed in Italy, the German army retreated north and consolidated its position on the "Gothic Line": a series of fortifications that ran from the Tyrrhenian Sea to the Adriatic Sea, right through the Apennines. Consequently, the territories of the Reserve were heavily involved in the liberation efforts by the British and American Allied forces on this front, which went through Castelnuovo di Garfagnana and Barga. There was widespread participation in the Partisan Resistance, as demonstrated by the brave declaration of the "Republic of Montefiorino", in the Montefiorino Municipality in Modena, the Tombola Operation (of partisans and allies) in the Municipality of Albinea, and unfortunately also by the many reprisals against civilians by Nazis and Fascists in the Apennine territories included in the Reserve, even in places far from the Gothic Line. They include the massacres of Regnano (Casola in Lunigiana, 13 victims), Cervarolo (Villa Minozzo, 24 victims) and Bettola (Vezzano sul Crostolo, 32 victims) and Legoreccio (Vetto, 23 victims), the slaughters in Valla and San Terenzo Monti (Fivizzano), and the hundreds of victims who were rounded up during Operation Wallenstein in the summer of 1944 in the Parma area, including 33 civilians in Neviano degli Arduini, 15 in Monchio delle Corti and dozens of others in Palanzano, Corniglio, Tizzano Val Parma, Calestano and Langhirano. Similar events also occurred along the mountain and hill ranges of the Modena area, such as the Ospitaletto massacre in the Municipality of Marano sul Panaro (33 victims) to which a commemorative park is dedicated.

Many municipalities and locations in the proposed Reserve were subsequently awarded Gold Resistance Medals (e.g. Reggio nell'Emilia and Parma), and Medals of Military Valour or Civilian Merit in memory of the many innocent victims and the courage shown by the people. The profound involvement in this episode of Italian history that is still broadly felt by the people who live in the Reserve is shown by the widespread presence of associations such as the local branches of the Italian National Partisan Association (ANPI) and institutes that are part of the INSMLI (National Institute for the History of the Italian Liberation Movement) network, such as the extremely active Historical Institutes of the Resistance and the Contemporary Era in Lucca, Reggio Emilia, Parma and Modena. There are monuments and exhibition facilities throughout the area, including Resistance Museums in Sasso (Neviano degli Arduini) and Fosdinovo, the Museum

of the Gothic Line of Trignano (Fanano), the Diffuse Museum of the Gothic Line of Montese, the Museum of the Republic of Montefiorino and of the Italian Resistance (Montefiorino).

SPECIFY THE NUMBER OF SPOKEN AND WRITTEN LANGUAGES (INCLUDING ETHNIC, MINORITY AND ENDANGERED LANGUAGES) IN THE BIOSPHERE RESERVE.

Emilian-Romagnol (native name: Emiliàn-Rumagnòl) is a Gallo-Italian language, within which it is possible to distinguish between the Emilian and Romagnol dialects. Only Emilian is spoken in the Reserve area. This group of dialects was recognised among the minority languages of Europe in 1981 and listed among the languages worthy of protection by UNESCO in the Red Book of Endangered Languages.

Tuscany: The Garfagnino dialect is part of the Garfagnino-Versiliese group. It is a transitional dialect that lies between Lucchese and Massese-Lunigianese, with strong Emilian and Ligurian elements. Lunigiana has always been squeezed between the sea and the mountains. There are a number of strategic communication routes running through the area and it has had many rulers. The local dialect is known as Lunigianese or Lunense and it is part of the large Emilian dialect family. The nature of the territory and the geographical setting mean that Lunigianese is a fusion of the similarities noted and the influences on the local dialect over the centuries. It contains Tuscan and Genoese expressions, but the core syntax and sound come from the main Emilian stock

Liguria Region: in the only municipality concerned, the local dialect is Lunigianese or Lunense (see above) The proximity and mutual contamination between the dialects spoken in the various parts of the Biosphere Reserve also confirm that this portion of the Tuscan-Emilian Apennines has deep common cultural roots.

11. BIOPHYSICAL CHARACTERISTICS

11.1. GENERAL DESCRIPTION OF SITE CHARACTERISTICS AND TOPOGRAPHY OF AREA

The Appennino Tosco-Emiliano belongs to the northern Apennine which extends from Passo della Cisa to the Bocca Trabaria pass. the area nominated to become a MaB Reserve extends along this ridge from its far western extreme to Passo delle Forbici, connecting almost all the peaks over 2,000 metres in this part of the Apennines: Monte Cusna (2,121 m above sea level), Monte Prado (2,054 m above sea level, the only one over 2,000 m in Tuscany), Alpe di Succiso (2,017 m above sea level, the most northerly over 2,000 m of the entire Apennine chain). From East to West the Reserve area is included between the basins of the Rivers Panaro and Taro that cross the Apennine chain, then turning to the Po Valley and the Po river as tributaries on the hydrographic right of the same. The area is furrowed by other important streams that start from the ridge they head to the Po Valley on one side and on the other towards the Tyrrhenian Sea (from the Emilian side of Romagna: T. (Creek) Baganza, T. Parma, T. Enza, F. Secchia, T. Dragone, T. Scoltenna – from the Tuscan and Ligurian side: T. Corsonna, T. Castiglione, F. (River) Serchio, T. Aulena, T. Taverone, F. Magra). The area also extends from the main ridge (Euro-Mediterranean climate border) down to the adjacent valleys, extending towards the north and south, on both sides. Towards the south, it descends steep gradients almost reaching sea level along the valley of the River Magra and reaching the foothills of the Apuan Alps. Heading north, it almost reaches the Po valley stretching as far as the alluvial fans of the Apennine foothills and partially including some important urban centres (towns of Parma and Reggio Emilia).

Physiographically, the areal distribution of the southern slope is smaller than the northern slope due to its steeper gradients. To the south, the slope is steep, precipitous and heavily carved out, while to the north it tends to fall away gently, becoming a rolling landscape. Two aspects have led to this morphological diversity: the varied geological heritage described in chapter 11.4 and the varied climatic conditions (see chap. 11.3). The elevation levels also reflect the asymmetry between the two slopes: while, on the one hand, the mean and median altitudes sit around 1,000 metres, the most frequently occurring altitude in these areas (the mode, in statistical terms) is lower, around 600 m above sea level.

11.2. ALTITUDINAL RANGE

From an altimetric point of view, the highest elevation of the enlarged area of the Reserve is represented by Mount Cimone (2165 m above sea level) which is also the highest promontory in this sector of the Apennines.

Noteworthy is Mount Cusna (2121 m above sea level). The lowest elevations are the northern and southern extremes of the valley floor (between 20 m above sea level and 170 m above sea level). The mean altitude of the candidate area is 1,058 metres above sea level..

Highest elevation above sea level	2165 metres (Mt. Cimone)
Lowest elevation above sea level	20 metres (Comune di Fosdinovo)

11.3. CLIMATE

The candidate area has an unusual climatic situation due to the fact that it is traversed by the Euro-Mediterranean climatic boundary, which coincides with the ridge in this section of the Apennines.

On the whole, the climate has subcontinental characteristics, with the altitude of the area proving more of a determining factor than its distance from the sea. The Tyrrhenian Sea has an impact on the southern part of the candidate area, meaning that mountainous climatic conditions (cold, snowy winters and cool summers) only exist in the high-altitude zones, while on the lower slopes the climatic conditions become progressively more like a Mediterranean climate, featuring hot, dry summers and mild winters.

In winter, temperatures across the majority of the candidate area are generally extremely cold, with local averages falling below 0°C on the highest ridges and at the heads of the valleys on the Po Valley side. There is heavy snowfall in the winter but the snow cover only remains in the areas higher than 1,000m in altitude.

The intermontane basins, which are less exposed to the sea, and the portion of land facing the Po Valley experience a climate with continental characteristics (cold winters and hot summers). The isotherms on the steep Tyrrhenian slope are denser, and the meteorological conditions are affected by the low pressure that is often experienced in the northern part of the Tyrrhenian Sea. There is heavy rainfall in the highest areas (over 1,500mm a year) but this becomes lighter as the altitude decreases. The areas that experience the most rainfall are on the Tyrrhenian slope, which sees extremely humid sea breezes blowing in from the south-west (libeccio) and sometimes from southern France (mistral), whereas the basins and the Po Valley slope experience much lighter rainfall. The area receives winds including the north-easterly wind (gregale) and the south-easterly wind (scirocco), which both blow in fairly

frequently. The territory of the Biosphere Reserve belongs to the group of Temperate Middle-Latitude Climates (C) under the Köppen climate classification. However, the area also demonstrates features of the Csa and Cfa subgroups:

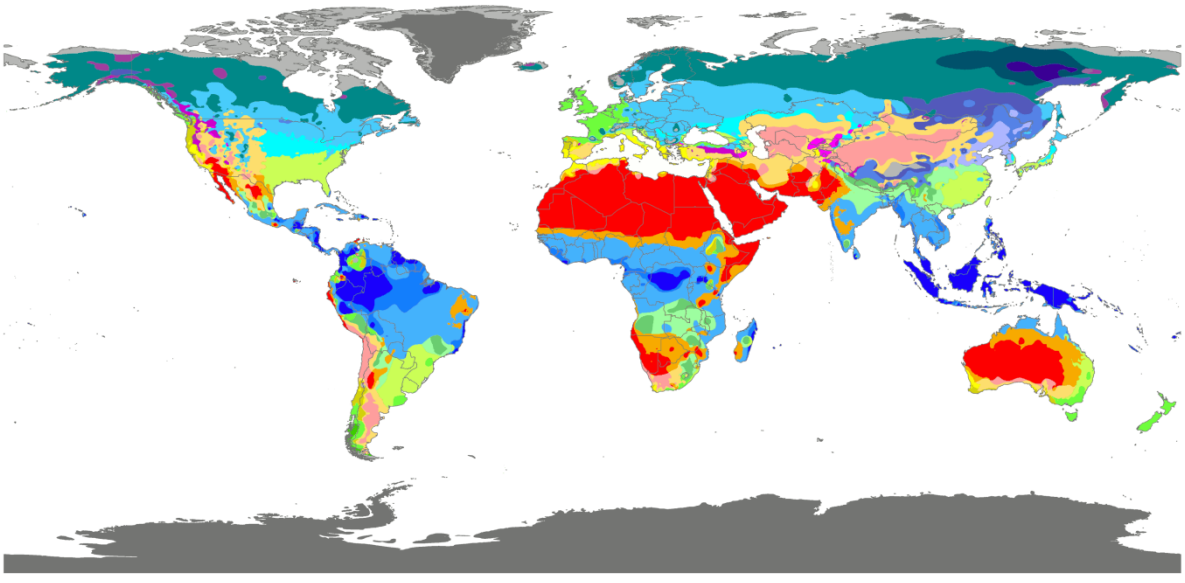
- Csa: temperate, humid climate with dry, very hot summers; the warmest month features temperatures above 22°C;
- Cfa: temperate, humid climate in all seasons with very hot summers; the warmest month features temperatures above 22°C.

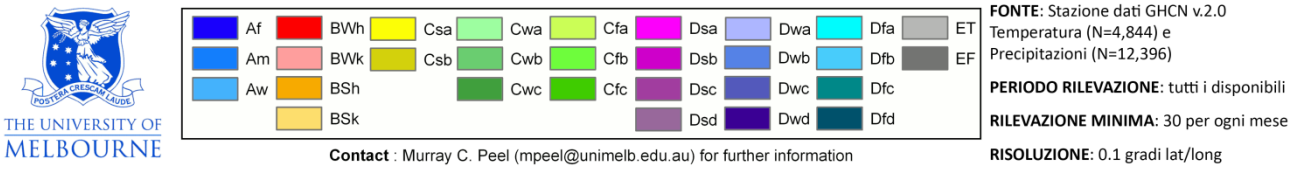
The ridge marks the divide between subgroups. It forms the boundary between the following climate zones:

- Mediterranean climate zone, which is characterised by a lengthy dry period during the summer and mild winters (Csa).
- Temperate, humid Continental climate zone, which is characterised by temperate, cool summers, cold, snowy winters in the highest areas and rainfall ranging from 700mm to 1,500mm a year (Cfa)

Average temperature of the warmest month	20.2 °C
Average temperature of the coldest month	1.1 °C
Mean annual precipitation	846.1 mm

Classificazione climatica mondiale secondo il sistema Köppen–Geiger





IS THERE A METEOROLOGICAL STATION IN OR NEAR THE PROPOSED BIOSPHERE RESERVE? IF SO, WHAT IS ITS NAME AND LOCATION AND HOW LONG HAS IT BEEN OPERATING?

The Monte Cimone meteorological station is the main World Meteorological Organisation (WMO) and Italian air force meteorological station. The areas within its scope are the summit of Monte Cimone and the corresponding Tuscan-Emilian Apennine mountain area. The meteorological station is situated in the north-east of Italy, in the Region of Emilia-Romagna, in the Province of Modena, in the Municipality of Sestola, at 2,173m above sea level and a few dozen metres down from the summit of the mountain. Its geographical coordinates are 44°11'36.98" N 10°41'54.58" E. The Monte Cimone meteorological station is one of the official Italian stations that are part of the WMO's GCOS (Global Climate Observation System) programme. In addition, Mount Cimone hosts the GAW (Mount Cimone Global Station of the Italian Climate Observatory "Ottavio Vittori" ISAC) of the CNR (National Research Council - Earth and Environment Department – Institute of Atmospheric Sciences and Climate - www.isac.cnr.it/cimone/).

The first meteorological station was opened on Monte Cimone in 1882 and remained operative until 1928. In 1937 another Italian air force station began operation, housed in the building of the barracks that was completed the previous year. The station ceased activity in 1940 due to events linked to the Second World War, during which the observatory was completely destroyed.

In 1945 a new station was established and began operation, measuring meteorological data as part of research into the climate on the highest summit of the northern Apennines, as well as assisting with aircraft navigation.

There are also a number of small, less important meteorological stations located in the main towns in the area of the Reserve in all the included regions (Canossa, Carpineti, Castelnuovo Ne' Monti, Ligonchio, Neviano degli Arduini, Parma, Pavullo, Reggio Emilia, San Felice su Panaro, Sant'Anna Pelago, Pian dei Termini, Passo Croce Arcana, Campotizzoro, Castelnuovo Magra), operative and monitored by the designated regional authorities.

11.4. GEOLOGY, GEOMORPHOLOGY, SOILS

The geological history of the northern Apennines underlying the nominated area is complex and fascinating and warrants a treaty in its own right. In this section, we decided to restrict ourselves to summarising the geological mechanism that gave rise to the current landscape and the geological features that continue to affect the physical and chemical characteristics of the soils, the circulation of water and colonisation by plants and animals, including man.

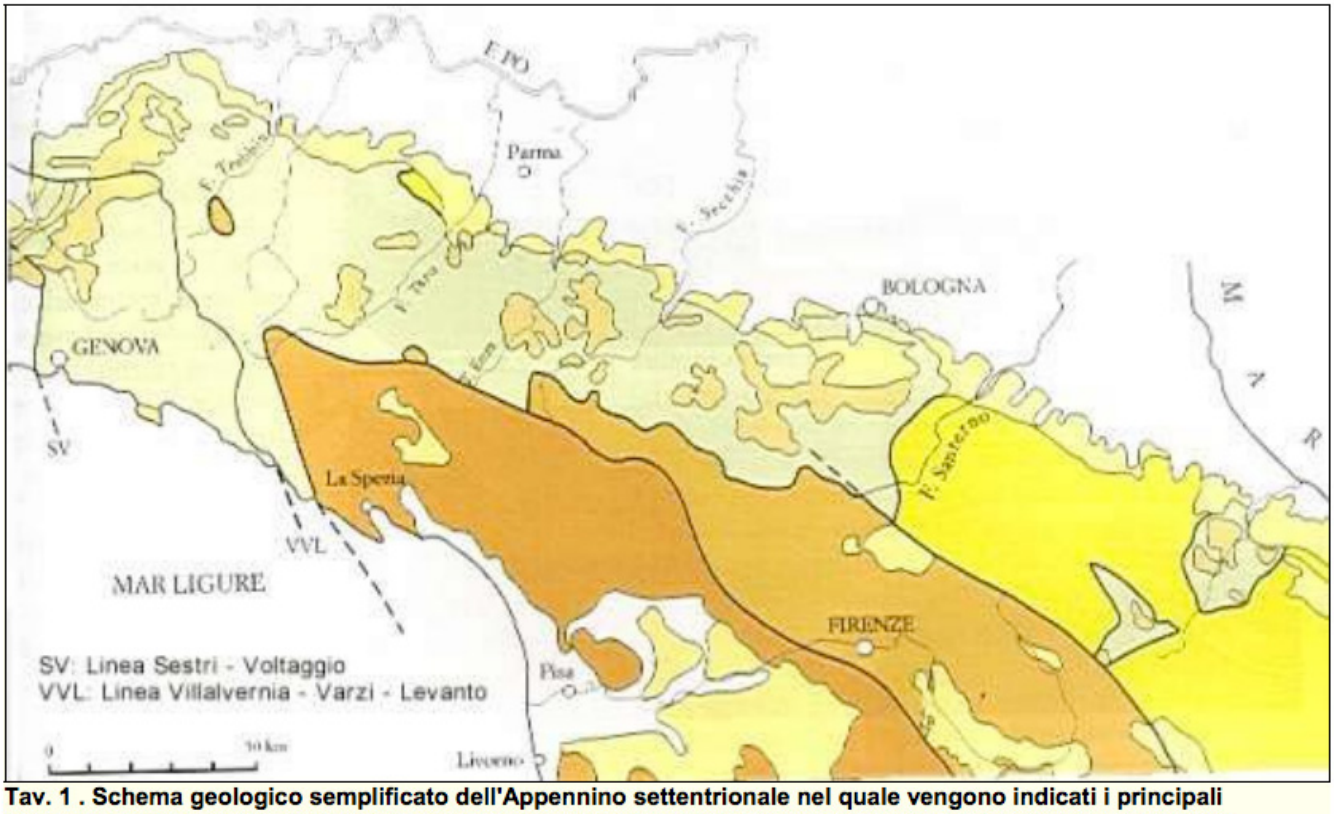
As previously mentioned, the area that has been nominated to become a MaB reserve is made up of a ridge, an unbroken line, which unites two climatic zones, becoming a zone of admixture and transit in addition to an ecological corridor of considerable importance. In terms of geological criteria, the area that has been nominated to become a MaB reserve has also been found to be a "meeting ground" along the border, which is morphologically determined by the ridge. The ridge itself,

however, exists as a function of the geological history of this area; it is therefore necessary to take a step back and analyse how the area has acquired its present form.

The shape and formation of the Tuscan-Emilian Apennine is linked to the same orogenetic process that shaped the entire Italian peninsula and is linked to the collision of the African and European plates during the late Mesozoic Era. This collision resulted in the piling up of numerous strata that were deformed, buckled and stacked upon one another by the slow pressure generated by the movements of the lithosphere.

Two paleogeographic blocks collided-converged in this area, originally being a long way from each other (100-200 km), one being referred to as "allochthonous blocks" (Ligurian and Epiligurian blocks) and the others, "autochthonous blocks" (Tuscan block). The

- *Figure 11.1 - Paleogeographical domains of the Northern Apennines.*



Tav. 1 . Schema geologico semplificato dell'Appennino settentrionale nel quale vengono indicati i principali protagonisti della struttura geologica del territorio emiliano-romagnolo. Le linee più spese indicano i contatti tettonici importanti (da Mutti *et.al.* 1975, semplificata)

1a **Unità Umbro-Marchigiane**

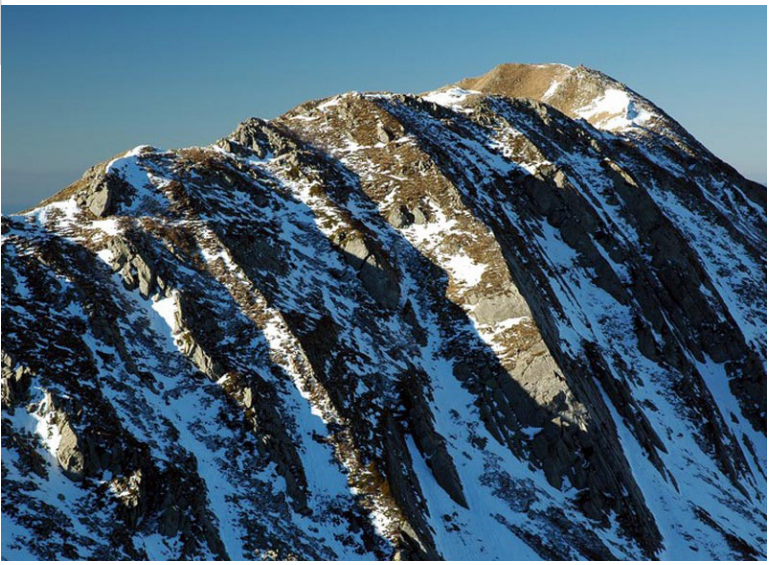
1b **Complesso M. Modino-M-Cervarola**

1c **Unità Toscane**

2 **Depositi neoautoctoni**

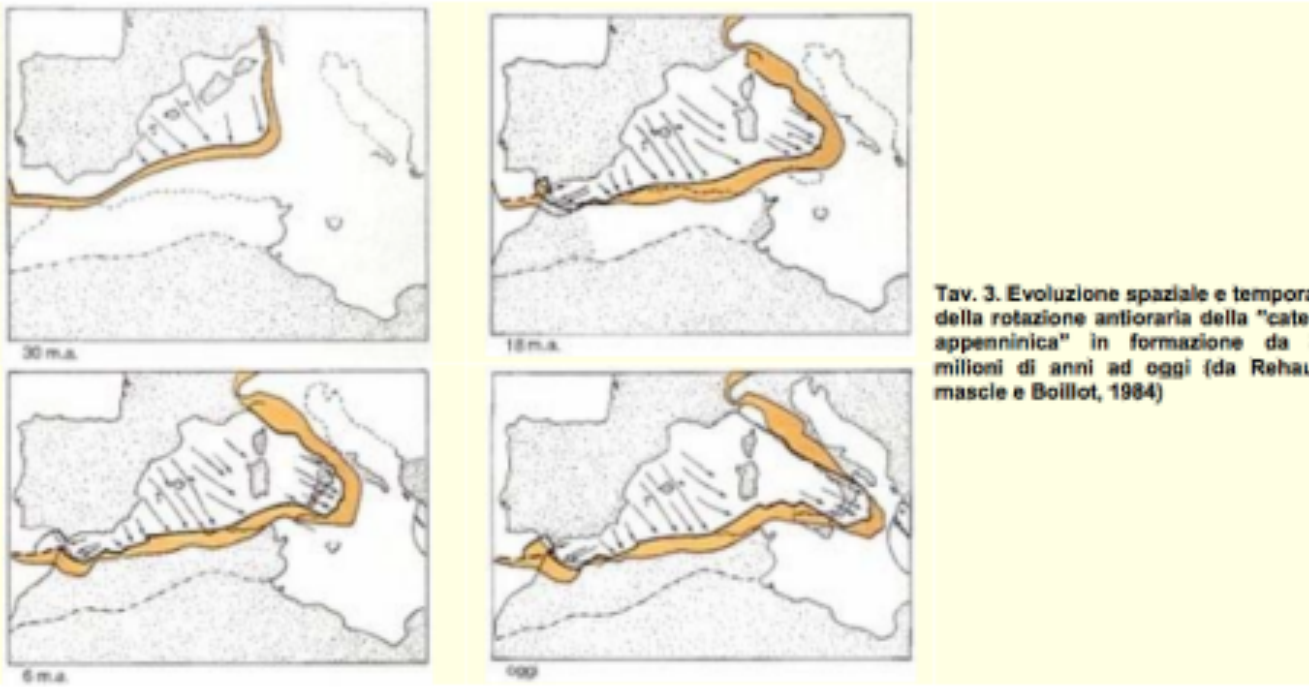
3 **Sucessione epiligure**

4 **Unità liguri**



former blocks are composed of various kinds of rocks, which settled in the deep sea (Ligurian Basin) between present-day Corsica and the Tyrrhenian coast during the period between the Upper Jurassic and Middle Eocene, i.e. between 150 and 45 million years ago. The latter comprise a succession of rocks of exclusively sedimentary origin that are predominantly carbonate, deposited in a shallower environment with the precipitation of gypsum, anhydrite and chlorides resulting from the extensive process of evaporation of a vast sea.

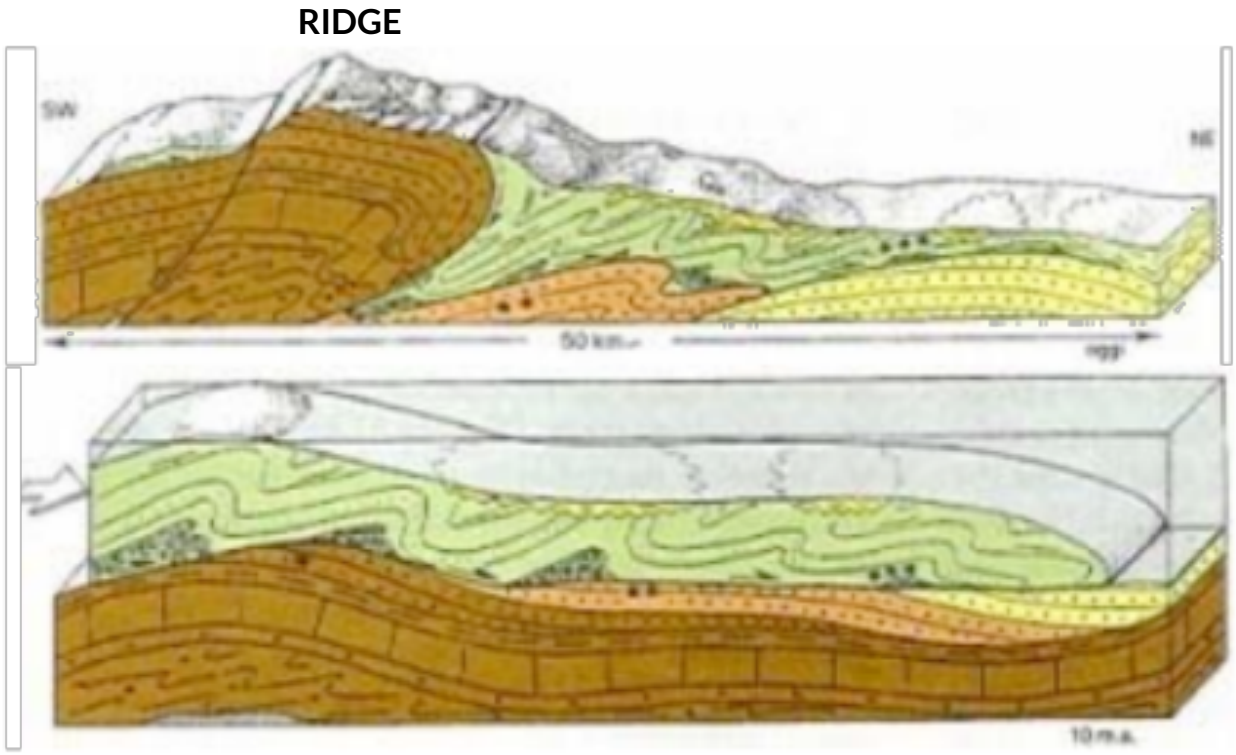
The autochthonous blocks are those that are normally found at greater depths, as they are covered up by the Ligurian blocks during a first compressive orogenic phase that involved the northern Apennines between the Cretaceous and the Oligocene, culminating in the Tortonian (Late Miocene) about 10 million years ago. From this moment on, starting from the Early Miocene-Pliocene, the subsequent orogenic phases will define a different geological context between the external front of the chain (Po Valley, Emilian sector of the Reserve) and the Tyrrhenian inner front (in general the Tuscan and Ligurian sector of the Reserve). With the continuation of the thrusts, on the external front a compressive tectonics is maintained that manifests itself through the migration to N and NE of the foredeep-foreland-chain system, a process still in progress as evidenced by the recent seismic activity in the Plain of Reggio Emilia, Parma and Modena, in the same Emilian sector. Finally, there is an important event during the Pliocene (about 6-2 million years ago) due to a marine transgression that brought with it the deposition of clays, loams and sands in the area of the current Po Valley, deposits that surface today in many hilly areas of the Reserve that are home to important forms of the landscape such as badlands. On the other hand, the evolution of the internal front of the Apennine chain is different and between the Late Miocene/Early Pliocene and the Early Pleistocene there is a regime of extensive tectonics related to the rifting process taking place in the Tyrrhenian Sea: the propagation of the main Tyrrhenian relaxing faults combined with the local action of minor antithetic relaxant faults causes a breakdown and rotation in blocks of the previous structural building, creating a sort of listric step; the resulting complex structure, morphologically, is characterised by high structural and depressed areas even a few kilometres from the initial position. This forms the main intramountain tectonic depressions of the area (Pontremoli basin, Aulla-Olivola basin, Barga basin, Castelnuovo di Garfagnana-Pieve Fosciana basin and Sarzana basin) which lay the foundations for the definition of the structure of the current regions of Lunigiana and Garfagnana. Most of these basins were filled in the early Pleistocene by a succession of fluvio-lake deposits, generally fine-grained and rich in lignite at the base passing through conglomerates to the roof, then surmounted by alluvial deposits and extensive conoids of the Middle-Upper Pleistocene (e.g. Pieve Fosciana, Barga) that were progressively etched by the main waterways (Magra and Serchio rivers) during a tectonic lifting phase still in progress.

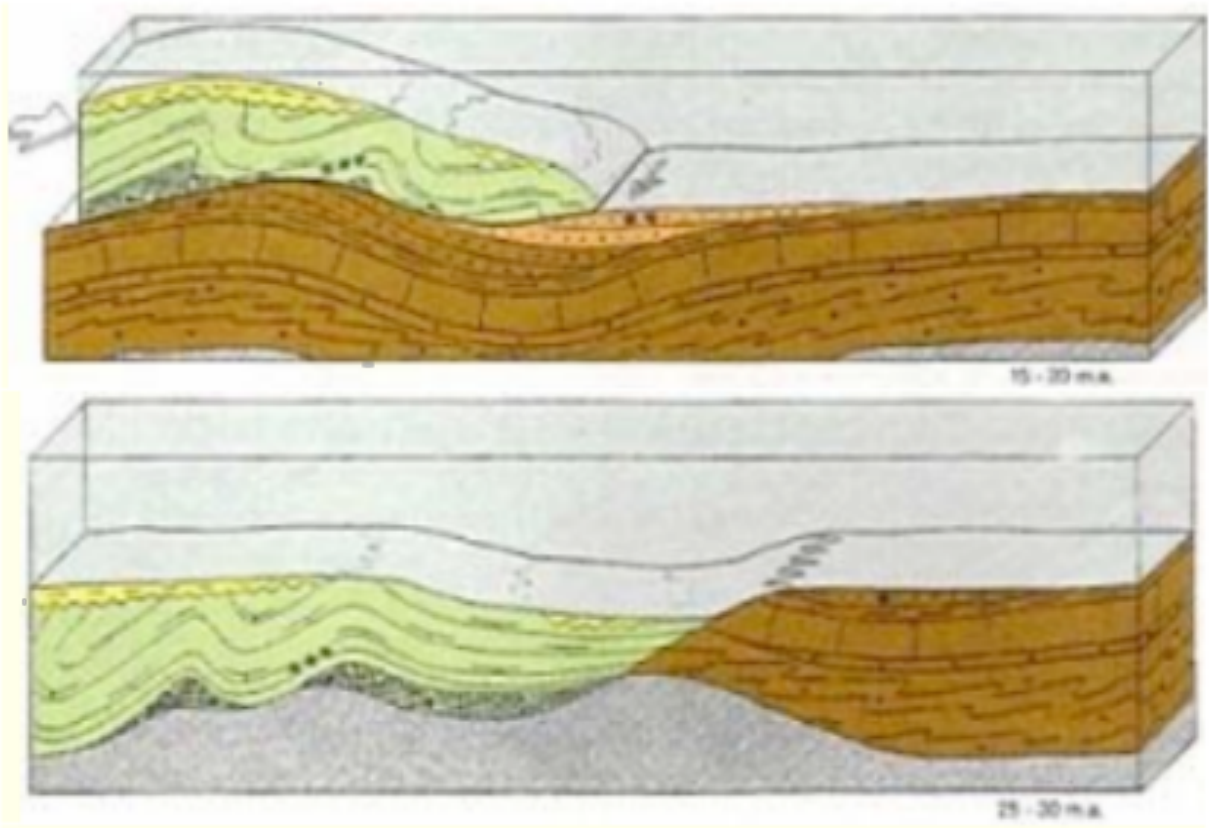


- *Figure 11.2 - Spatial and temporal evolution of the anti-clockwise rotation of the Apennine chain.*

The landscape of the Biosphere Reserve is therefore largely determined by the paleogeographical units ("allochthonous", "native") overlapping with each other during the early orogenic phases, then reprocessed differently in the two sectors, southern and northern. The contact line between Ligurian Units and Tuscan Units reflects the trend of the Apennine ridge with good approximation. The different nature of the rocks that make up the two sides determine the different slopes, the direction and density of the hydrological lattice and the structure of hydrogeological bodies. It should also be noted that various flaps of rock formations referring to paleo environments older than the above exposed and related to moments of oceanic opening or convergence between plates (Paleozoic) give rise to widespread outcrops of ophiolites, basaltic laves, granite olistolites affected in different phases by the lifting of the Apennine Chain.

Finally, it should be noted that very often various formations or rock units are named after local oronyms and place names, suggesting that these areas are of reference on a regional and national scale from a stratigraphic point of view (e.g. Formation of Mount Modino, Sandstones of Mount Cervarola, Mudstones of Fiumalbo, Formation of the Royal Abetina, Sandstones of Poggio Mezzature, Mudstones of the Uccelliera, Formation of Romanoro, Flysch of Monghidoro, Flysch of Mount Venere, Flysch of Mount Caio, Limestones of Groppo del Vescovo, Sandstones of Ponte Bratica, Sandstones of Gruppo Sovrano, Marne of Antognola, Formation of Pantano).





- *Figure 11.3 - Structural evolution of the western edge of the Adria Plate in the Cenozoic.*

GEOLOGICAL CHARACTERISTICS AND THEIR RELATIONSHIP WITH THE BIOSPHERE

As is to be expected, the majority of the rock units in the area originate from an oceanic basin during the closing phase, which was gradually filled up with sediment until the bay closed completely, surfaced and recently rose up.

The rocks are composed of medium-fine sediments, with a strong presence of clays that have given rise to the varieties of soil present and resulted in gentle, rolling landscapes that adapt easily to the requirements of pastoral farming and breeding. These clays, in addition to being the main substrate for fodder, also offer a unique resource that has led to the development of a superior ceramic industry north of the Reserve area (mention should be made of the two Geosites corresponding to two quarries of clay materials useful to the ceramic industry located in the Municipality of Carpineti: Quarries of Colombaia and Quarries of La Dorgola Creek). In addition to these sediments, called neoautoctonous due to their recent settling and their vicinity to the range under formation, there is evidence of the preceding turbulent geological history. This has led to distinctive features that are usually associated with specific endemic vegetation and wildlife: including, in order of age, granite olistolites and Triassic evaporites, ophiolites, turbidite sequences, "Pietra di Bismantova" (rock), Rocks of Rocca Malatina and glacial deposits. These are often recognised as geological sites because of their importance to understanding the area, which is necessary for both conservation and safeguarding policies and for mindful exploitation of the same. In addition, the elevations deriving from the presence of these rocks - often tower-shaped or emerging suddenly from medium-sweet morphologies - become privileged areas for numerous plant and animal species that take advantage of the exposure of the slopes or walls to settle and find refuge.

With regard to aspects directly related to geology and specifically related to the presence of hydrocarbons in the candidate area, are noteworthy: the "mud volcanoes" found in the Modena belt (Le Salse di Nirano, one of the pseudo-volcanic phenomena best developed throughout the Italian territory, and among the largest in Europe, included in a Regional Nature Reserve, in the SIC/ZSC IT 4040007 and recognized as a geosite, with nearby visitor centres and an important use; Salsa de La Canalina in the municipality of Polinago, Salse or "bombi" of Ospitaletto in the Municipality of Marano sul Panaro; Salsa de La Canalina, Municipality of Polinago), in the Reggiano (the Sauces of Regnano and Casola Querciola in the Municipality of Viano;) and Parma (Salse di Rivalta – SIC IT4020023, Municipality of Lesignano de' Bagni) of the Reserve that determine, for rates of salinity on the ground and for the influence of the gases emitted (primarily methane), of the very particular environmental conditions where floristic-vegetation species and completely particular animals can find space (an example: among the highly specialized plants that live in this environment stands out the Puccinellia fasciculata). Another important site under this reading key is given by the former "oil mine" of the Pozzi di Vallezza in the Municipality of Fornovo di Taro (PR). Mining was declared exhausted in 1994 after a history of very large scientific and productive research (the first observations can be found in the Chronicon Placentinorum by Giovanni De Mussis, in the late 1200s, where there was talk of oil outcrops in the soil). Today the area of the former mine is home to the only Oil Museum in Italy. It should be noted that the first oil on Italian soil was extracted at this site. An entire community has worked on these hills focusing experiences, technologies and commitment for decades. The first well was excavated in 1864 between Respiccio and Neviano Rossi, directly from the owners of a land. The development of the site and the mining

implementation is mainly due to Luigi Scotti, who in 1905 set up a drilling company and dug over 100 wells. Today, the archaeological interest of the entire mining settlement (pumping plants, extraction trestles, chain systems, tie rods and gears are still intact), is combined with the singular value of the environmental context, where the old anthropic structures, agricultural activities and the natural landscape live together.

Important thermal events can be found along the valley floor of the Parma Stream, in the Municipality of Corniglio, in a large area between Miano and the small town of Fornace, also marked by the toponymy (hot spring) and in the Modenese (Terme di Salvarola). In the area surface manifestations of gas, even abundant, were known in the past in the area of Miano as "Fires of Ligna" (first mining concession in 1893). The presence of warm water on the surface today is linked to the past hydrocarbon research activity, which took place in the Miano area several times with the excavation of wells at different depths, until in 1907 a drilling began that the Italian Petroli Society brought to a depth of 1,050 m. Currently, along the right bank of the Parma stream, just east of the small town of Fornace, there are old pipes that, taking advantage of the drilling of 1907, pick up hot water that spontaneously rises from the depths of the ground.

The Municipality of Palagano is noteworthy with its important mining sites frequented since time by the Etruscans where, in ophiolite complexes, various chalcopiritic mineralisations are found.

This chapter concludes with reference to the area's hydrogeological instability and seismogenicity, which demonstrates that the orogenic process is still ongoing and has had a significant influence on the land's inhabitation by man over the last 10,000 years.

GRANITE OLISTOLITES

Another important Geosite of regional importance lies in the Reserve area: the Granite of Groppo del Vescovo, in the Municipality of Berceto.

It is a large light brecciated granite boulder of paleozoic age, immersed in a beautiful mountain landscape. It is actually a voluminous olistolitis incorporated into a brecciated lithozone found in Rombecco in the basal part of the Flysch of M. Caio.

Rombecco granite is actually a sedimentary breccia, that is, a rock formed by angular fragments of a different nature, in which, however, most of it is given by large granite fragments. The outcrop is furrowed by the Baganzolo Stream, which flows steeply on these rocks forming a slender waterfall, at the base of which large compact granite boulders show traces of old quarry tests, extraction attempts made in the first decades of the 1900s, when it was thought to exploit the outcrop productively.

The exact age of Rombecco granite was established with techniques of absolute dating, and turned out to be about 300 million years, its formation therefore dates back to the "Ercinic orogeny". These ancient granite masses were dismembered by the opening of a new ocean and, in some ways, involved in the subsequent Apennine orogeny, which incorporated parts of it by mixing them between newer rocks. It should be emphasized that in the Tuscan Emilian Apennines granite is a very rare rock.

GYPSUM (EVAPORITES)

The Triassic gypsum outcrops are among the Apennines' oldest rocks: their origins date back over 200 million years. At that time, all of the land masses were joined to form a single, super-continent, Pangaea, bordered on the east by the large oceanic basin of the Tethys Ocean. The waters of this ancient sea, which evaporated into vast lagoons, deposited gypsum, limestone and salt. The presence of the latter, which is now only found at depth, is demonstrated by the salinity of the Fonti di Poiano (Reggio Emilia), the largest karst resurgence in the Northern Apennines.

These evaporites, part of the Formation of the Anidriti di Burano, crop up in very few places, in just one part of the Northern Apennines within the candidate area, along a section of approximately 23 km that stretches from the River Secchia Valley in Emilia to Sassalbo (Fivizzano) on the Tuscan side.

Due to the solubility of these rocks, all of this area has a karst topography, with the presence of unusual formations such as caves, wells, sinkholes, underground streams, karren and dolines. These diverse environments, which have always been hard to access and utilise due to their bedrock, exposure and gradients, have led to high levels of biodiversity: 21 habitats of community interest, unusual and slightly halophilic vegetation, with over 600 species of flora (some rare and some extremely rare) and as many as 17 species of Chiroptera.

Also highlighted is the presence of Messinan gypsum outcrops (Geosite of the Gypsum Outcrops of the Castle of Borzano in the Municipality of Albinea and other widespread areas and referring to the passage of the so-called Line of the Gypsum Outcrops of the Reggio Hills).

More recently, the Miocenic gypsum outcrops of the Gessoso-Solfifera formation at the base of the Emilian hilly belt testify to the drying phase of the Mediterranean Sea and have been exploited for the production of gypsum for the construction industry. They emerge in a narrow band bordered by important faults, which develops between Mount Lunetta and the Castle of Borzano, within the SIC IT4030017 "Ca' del Vento, Ca' del Lupo, Gypsum Outcrops of Borzano". This strip is home to numerous caves and cavities of karst origin, including some of archaeological interest such as the Tana della Mussina.

OPHIOLITES

A special feature of the Liguride units is the presence of igneous and metamorphic rocks that made up the ancient oceanic lithosphere of the Ligurian – Piedmont basin, (between Jurassic and Cretaceous) that geologists generically call "ophiolites". Most of the outlining ophiolites correspond to magmatic rocks of basaltic composition both of intrusive origin (Philonian gabbros), and of effusive origin (MORB basalts typical of the current and past ocean floor), while subordinate is the presence of serpentinites, i.e. low-grade metamorphic rocks. Pillow lavas are common among the effusive rocks - generally dark or reddish. They are typical of underwater eruptions, together with the self-clastic products of the decomposition of the lavas and their erosion, composed mostly of glass clast breccia rocks and known as hyaloclastite breccia. Spectacular outcrops of pillow lavas are present at the Rossena cliff in the Municipality of Canossa and in the valley of the Dragone creek, at the Horn Belt and the Tignoso Stone, where there are rare structures known as "variolites" - spherical structures of various sizes generated by a rapid cooling of the lavas.

The serpentinites now observable in ophiolite complexes represent a testimony of the upper mantle of the seabed of the Ligurian - Piedmontese Ocean. The original rocks from which they derive (the "protolites") were the possible source of the basaltic magmas that formed the corresponding Oceanic Crust. Serpentinites are often crossed by hydrothermal mineralisations such as quartz veins and carbonates that locally generate so-called "ophicalce"; rare are other mineralisations among which the presence of asbestos (ophiolite of Vesale, Municipality of Sestola), chalcopyrite, pyrite and blenda (Horn Belt, Boccasuolo ophiolites, Municipality of Palagano) and the rare datolite are mentioned. In some areas of outcrops these rocks come in the form of serpentine breccia rocks that testify to the action of Jurassic normal faults in the Ligurian - Piedmontese Basin.

Ophiolites constituted the Crust and the upper portion of the Mantle of the Ligurian-Piedmontese Ocean and during the Apennine orogeny they were variously located generating complex relationships with the surrounding sediments of the other paleogeographical units. Their composition makes them more resistant to erosion than the surrounding clay sediment. This caused distinctive features in the landscape: the harshness and selectivity of the rugged environments, geomorphological diversity, microclimate and the physical-chemical features of the substrate make them important places of refuge for rare plant species, for plants of the high Apennine ridges and, conversely, for the Mediterranean flora and endemic species. The floristic and vegetation richness of ophiolite sites is particularly linked to the presence of species that live only on substrates of this type (e.g. Alyssoides utriculata (L.) Medicus and Euphorbia Spinosa (L.) (Subsp.) ligustica) and numerous "glacial relics" species such as Aster alpinus L., Soldanella alpina L., Primula marginata Curtis and Pinus marginata Miller. As a testimony to this, the most important ophiolite sites that fall within the Biosphere Reserve are represented by the Core Area of the Campotrera Cliff, Rossena (Regional Nature Reserve and ZSC IT4030014, which hosts 7 habitats of Community interest of which 3 are priority) and the Core Area of Mount Prinzera (Regional Reserve and ZSC IT4020006, which hosts 12 habitats of Community interest of which 2 are priority).

The Apennine ophiolite cliffs also played an important role in the history of man: in prehistory they represented places of strategic importance for the natural control of the surrounding territory, as witnessed within the Reserve, for example, by the Iron Age site near Rocca Galgana (Fornovo di Taro, Buffer Area of Mount Prinzera). During the Middle Ages, the strategic role of some ophiolite cliffs was enhanced with the construction of fortresses and castles, an important example is that of the Castle of Rossena in the Municipality of Canossa (or that of Bibola, Municipality of Aulla); in both historical and modern times, ophiolite sites have finally accounted for an important economic resource with the establishment of mining activities for ornamental stones as well as for the individual minerals contained in them (copper, iron, alabaster, talc).

In the Reserve area the man has historically developed a mining activity related to the presence of serpentinites. Evidence of this is the Mines of the Valley of the Dragone creek, sites cultivated in ancient times and of which there is clear documentation from the time of the Estensi (at the State Archive of Modena), linked to the extraction of chalcopyrite, pyrite and zinc blende, mostly for the production of copper. The mining activity - important in the past and until the 1950s also in the area of the Rupe di Campotrera - is still alive with the cultivation of quarries for alternative stone material, as for example, at the Municipality of Sestola (Ophiolite of Vesale). The strong connection of part of the territory with a historical mining activity is also observable in topography: clear is the example of the etymology of the name of the Municipality of

Palagano, from "palàga" or "nugget of gold". A mineral exploited economically until the 1960s and contained in the ophiolite rocks of the Biosphere Reserve is talc, found for instance in the municipality of Berceto near Ghiare (where the ancient Cementificio Marchino stood), a moorish town where it comes in the form of the Steatite variety.

Finally, an aspect that is both economic and health related to ophiolites is the likely presence of asbestos minerals such as chrysotile inside serpentinites. These minerals were widely exploited and extracted because they had excellent characteristics (high resistance to heat and chemical attacks) for some industrial sectors. Fortunately, as a result of numerous studies which have shown the high incidence of deadly diseases such as asbestosis and lung cancer in the most exposed workers, the extraction of these minerals has been banned since 1994.

TURBIDITES

The deposits of sediments of the northern Appennine are characterised by the abundance of turbidites, that is alternating laminates of sandstone and finer sediments, originated in ancient seabeds. Turbidites are named after the sediment deposition process that generates them – turbidity currents - a very rapid flow of water and suspended mud distributed on the seabed caused by an underwater landslide, which can be very broad. The turbidites are also known as "Flysch", a term that stands for a sequence of sediments derived from a range that has surfaced and been broken up.

There are two types of Flysch in the Northern Apennines, which can be differentiated by the type of substrate on which they have settled:

- the older Flysch (Cretaceous-Eocene) of the Ligurian Units have settled on the oceanic crust and are connected to the subduction phases of the oceanic crust of the Ligure-Piemontese basin. These are, for instance, the historically known "Flysch ad Elmintoidi" and related units (e.g. Flysch of Monghidoro, Flysch of M. Venere) that are well exposed along some stretches of the valleys and river bed of the Dragone, Dolo and Tresinaro creeks, which correspond to geosites of local interest.
- the younger Flysch (Oligocene-Miocene) of the Tuscan and Umbria-Marche units have a continental substrate (Apulian plate) and are linked to the continental collision phase of Africa and Europe in which the Apulian plate was subducted under the European one. Among these is mentioned the unity historically known as "Macigno" that characterizes the entire Apennine ridge roughly between Pontremoli and Abetone.

These rocks are typical throughout the Apennines. They have always been one of the preferred lithotypes for carrying out stonemasonry, in addition to being a distinctive feature of the landscape for their characteristic alternating layers, which have been eroded by the atmospheric agents to different extents.

PIETRA DI BISMANTOVA

The Pietra di Bismantova is a spectacular block of yellowish sandstone, which appears to be floating on a sea of clay sediments. It is an emblematic geological formation, as well as an important geological site. The Pietra is made up of a biocalcarenite rock formed by the accumulation of ancient sands along with fragments of mollusc shells, echinoidea (sea urchins), coralline algae, foraminiferida and fish teeth. These sediments were deposited during the Miocene, on a shallow and temperate seabed that was abundant with life.

Its square outline and rocky walls measuring up to 150 m are a result of the high resistance to erosion of the sandstone forming its bulk, which is in relief due to the fact that it rests on rocks that are softer and less resistant to erosion, such as marlstone and clay. It is an example of selective erosion, with a distinctive shape that can be identified from miles around, which stands out, away from the Apennine ridge.

The Pietra is a place of great importance: in terms of geology and literature, history and spirituality, mountaineering and Parmigiano-Reggiano cheese, tourism and farming, landscape and nature. There are at least nine habitats of Community interest, rupicolous and with pioneer herbaceous plants, of which 3 are defined as priority in the corresponding ZSC IT4030008.

Similar in morphological prominence and morphoseleptic processes are also the Sassi di Roccamalatina in the Province of Modena, which have different shapes compared to the tabular Pietra di Bismantova, characterised by the presence of sudden sharp rocky peaks and also composed of calcarenites "immersed" in clayish formations. From a geological and stratigraphic point of view these are in fact sedimentary sequences of the Epiligure domain belonging to the so-called Bismantova Group. These sequences constitute a characteristic limestone-silicoclastic plaque that stands out morphologically on the surrounding territory, generally composed of more erodible sequences of clays and marls that can be associated with the Ligurian domain.

Pietra (Stone) of Bismantova, Sassi (Rocks) of Rocca Malatina, Dito (Finger) of Samone, the Sasso di Sant'Andrea and the Salti del Diavolo, Sassoguidano constitute the most typical geosites falling in the Reserve as examples of morphostructures generated by the exogenous processes of selective erosion linked to this particular geological structure. It is therefore no coincidence that the first two sites mentioned coincide with as many Core Areas of the Biosphere Reserve.

Near the limestone-sandstone Epiligure plate are often also observed associated with karst morphologies or more typically "para-karst": sinkholes, swallows and the development of a karst lattice are not only related to the dissolution of carbonates but above all to preferential erosion along fractures of tectonic origin. Sometimes the plaque characteristic of the Bismantova Group, precisely because of the typical tectonic fracturing and the fact that it rests on the clay successions of the Ligurian domain, is subject to large gravitative phenomena such as lateral expansions, and derived collapses.

GLACIAL DEPOSITS

The northern Apennines show diffuse visible signs from only the last glacial period, Würm, between 70,000 and 10,000 years ago. Glacial-erosion cirque formations carved into the N and NE faces of the ridge, moraine deposits, lakes and wetlands testify to the presence of ancient glaciers, some of which were large, up to 7-8 km in length. This widespread presence of moraine deposits and evidence of glacial lakes referring to

the last Würmian glaciation, as well as deposits derived from the corresponding tardiglacial phases, has created the conditions of widespread waterproofing of the soils and has meant that some of them have been transformed during the Holocene into as many peat bogs and wetlands, among the most important and fragile ecosystems of the Reserve , of great value for the biodiversity present.

Important examples of deposits and corresponding glacial morphologies can be observed: in the upper valley of the Parma creek, between Sesta and Bosco where there is a spectacular language of moraine deposits included in the list of Geositi of the Emilia Romagna Region with the name of Morena di Bosco; between Mount Matto, Mount Sillara and Mount Bragalata; in Valley of the Tagliole, on the north side of M. Cimone (2165 m); on M. Alto (from which the Secchia river originates); on M. Prado; on M. Cusna; on the M. La Nuda and between M. Libro Aperto (1937 m) and M. Lagoni (1964 m), in the area of M. Giovo (1991 m) and M. Rondinaio (1964 m). The glacial deposits still strongly affect the landscape also in the area of the Alpicella delle Radici along the Fontanacce and Tagliole valleys, as well as along the high course of the Ospitale creek. Many of the places mentioned correspond to geosites of geomorphological interest and are often also characterised by the presence of moraine arches, glacial circuses and lakes of glacial origin (Lagacci della Porticciola, Lake Santo, Lake Baccio, Lake Torbido, Lake Turchino, Lake Ballano, Lake Dei, Lagoni, Lakes of Cerreto, Lake Bargetana etc.). In the reserve area there is also a totally filled glacial lake relic, always referring to tardiglacial terms of the last glaciation, which offered important historical data starting from the polline analysis of sediments (Piana di Lagdei, Municipality of Corniglio,).

However, not all the lakes near the Apennine ridge are of glacial origin and some are in fact due to the activity of landslides and Deep-seated Gravitational Slope Deformations (or DSGSDs). These include Lake Nymph, Lake Scaffaiolo (one of the highest in the Apennines, 1750 m) and Lake Pratignano which are linked to “summit splitting” phenomena typically related to the action of DSGSDs; Lake Pratignano is also a site of considerable interest from a botanical point of view since it is home to English sundew - a rare carnivorous plant of aquatic environment.

In the reserve area there is a site of particular interest as it contains glacial deposits the very ancient attributed to the penultimate glaciation (Riss), this is the top of Mount Navert in the municipality of Monchio delle Corti (PR).

LANDSLIDES

Precisely because of the arrangement for erosion of the different outcropping rock formations and for the widespread alternation of rocks at different degrees of erodability, the reserve area is characterised by widespread and important phenomena. These are in some cases historical landslides in others of ancient landslides referring to the tardiglacial moments of the last Wurmian glaciation. Some of the most important landslides included in the list of geosites of local and regional importance are mentioned: Landslide of the Woods of Valoria, involves the entire side that connects Poggio Mezzature with the Dolo Creek in the Municipality of Frassinoro; Corniglio landslide, of a complex type, is subject to periodic reactivations (1612, 1740, 1902) even recent (1996); Carnola-Montebello landslide at the foot of Pietra di Bismantova.

Starting always from the characteristics of the substrate and often in correlation with intense erosive phenomena subject to landslides, widespread development develops in the area of the Calanchive Morphological

Reserve (as for example in the northern portions of the Reserve in Maiatico, La Fredda, Serra del Corno, or in the Municipality of Baiso the Mélange di Baiso and the extensive outcrops of Argille Varicolori, beyond the badlands of the Rio Vico in the Municipality of Canossa and the extensive gully areas in the Municipality of Quattro Castella). Badlands generate an environment characterised by a particular microclimate, very dry and warm, given the inability of water to filter into the soil (in fact it tends to drain superficially). In these particular contexts widespread in Parma, Modena and Reggio Emilia, we witness the inhibition of the establishment of stable and complex plant communities due to the strong and continuous erosion of these stretches of slopes.

It is also worth noting the presence of landslide barrage lakes (Lake Nymph originated along a large landslide movement that marks the NE side of the M. Cimone in the Municipality of Sestola) and the presence of paleo surfaces set to day by ancient late glacial landslides (Geosite of Tugo-Valbona in the Municipality of Berceto).

OTHER GEOMORPHOLOGICAL ASPECTS

Gorges, carvings and waterfalls: Geosite of the gorges carved by the Fellicarolo creek (Municipality of Fanano) along whose eroded banks the Sandstones of Mount Cervarola emerge spectacularly; Geosite of the recessed valley of the Hospitable Creek; Geosite of the Doccione Waterfalls, located at about 1190 m above sea level, are among the most relevant and imposing of the entire Emilia-Romagna Apennines, at least in water flow; Gorges of the Scoltenna Stream (Montecreto, Riolunato, Lama Mocogno).

Morphologies from DSGSDs (Deep-seated Gravitational Slope Deformations): geosite of the "Fonni" of Mount della Penna and the graben of Acquaria in the Municipality of Sestola. The wavy and gibbous morphologies of the Camporaghena landslide (Comano) and the Patigno landslide (Zeri).

Periglacial "relic" morphologies: evidence of rock-glacier at Lake Baccio, east of Mount Giovo (1991 m); valley basins between Zocca and Montese that are now isolated from the current hydrographic lattice but which were part of the main one during the Last Glacial Maximum (LGM).

Glacial-related morphologies: within the Core Area of the Woods of Carrega (in the territory of the homonymous Regional Park) between Sala Baganza and Collecchio there are river terraces formed during the interglacial wet phases of the Pleistocene with widespread evidence of paleosols.

River morphologies: the waterways present in the Reserve are noteworthy for the interactions of an erosive nature operated at the expense of the geological substrate differential. Of particular importance is the morphological trend of the Tassobbio Creek that develops with repeated curvilinear trends and due to 6 river capture phenomena that occurred in this context.

TECTONICS

Mount Cimone (2165 m) is the highest mountain in the northern Apennines and owes its slender shape to the geological structure: there is in fact at the base an important oversliding that duplicates the succession of Ligurian rule and emerges near the Cavallaro Plan.

Examples of folded structures linked to Apennine tectonic movements are also diverse and widespread. These are both small and medium-scale structures visible in different contexts and often also in disused quarries linked to the ceramic district (e.g. at Gainazzo, Guiglia), and large-scale structures including the spectacular inverted anticlinal fold of Roncoscaglia (Sestola), multi-hectometric in size, which constitutes an important geosite of considerable didactic value, the Anticlinal of Gova (Frassinoro) , the Graben di Acquaria (Monte della Penna – Sestola), the Inverted Anticlinal Fold of Roncoscaglia (Municipality of Sestola). Also noteworthy are the so-called "Devil's Walls" due to the presence of verticalized and eroded flyschoid formations in a differential way, greater in the municipalities of Vezzano sul Crostolo and Casina along the slopes of Mount Duro.

HYDROGEOLOGICAL INSTABILITY

The candidate area is one of the Italian areas subject to the greatest hydrogeological instability, with over 20% of the hilly and mountainous territory affected by accumulations of active or quiescent landslides. Most landslide bodies, especially the larger ones, have characteristics of considerable persistence over time and their current distribution is the result of a thousand-year evolution of the slopes, in which periods of quiescence alternate, on the occasion of exceptional climatic events and strong earthquakes, more or less extensive mass remobilisations. The territorial distribution of landslides reveals their close dependence on predominantly clayey and/or structurally complex lithology formations. This phenomenon produces territorial and environmental changes in a sometimes rapid manner, often interfering negatively in human life and works and consequently assuming great social and economic importance.

Landslides, in a territory such as the northern Apennines, are by diffusion and number a peculiar feature largely attributable to the natural evolution of the landscape. It is a fact that the costs borne by the community as a result of hydrogeological instability are constantly increasing and are motivating the efforts of the institutions for the activities of knowledge, forecasting, prevention and mitigation of effects.

Within the Biosphere Reserve, the floods that have affected the valley bottoms in the recent past, particularly in the Tuscan sector, are also of great importance for hydrogeological and hydraulic risk. Among the main events are: the flood of June 19, 1996 that affected Garfagnana and nearby Versilia, where more than 470mm of rain fell in one day, with a death toll of 14 dead, 3500 families involved, 4000 homes involved; the flood of 25 October 2011 that affected the Spezzino and Lunigiana, where 542mm of rain fell in six hours, with a toll of 13 victims and 1183 displaced people, and which caused the closure of strategic communication axes such as the A12 motorway, the La Spezia – Genoa railway and made a very high number of provincial roads unusable. On the Emilian sector, some floods that affected Parma should be noted: the flood with flooding of the Taro River in 1982, the flood of Sala Baganza, Collecchio and Fornovo di Taro of 11 June 2011 and the flood of Parma of 13 October 2014.

YEAR	MCS SCALE (Mercalli - Cancani - Sieberg)	MAGNITUDE (Richter)	PLACE
1740	VII-VIII		Barga - Garfagnana
1746	VII		Garfagnana
1767	VII		Fivizzano - Lunigiana
1790	VI-VII		Aulla
1818	VII-VIII		Parmense – Sala Baganza
1834	VIII-IX	5.8	Alta Lunigiana
1835	VI-VII		Passo della Cisa
1837	X		Ugliancaldo – Alpi Apuane
1849	VI-VII		Val di Taro
1873	VI-VII		Liguria Orientale
1878	VI-VII		Bagnone - Lunigiana
1898	VII-VIII		Torrechiara – Valle del Parma
1902	VII		Fivizzano
1903	VII-VIII		Filattiera - Lunigiana
1914	VII		Media Garfagnana
1920	X	6.5	Lunigiana – Garfagnana
1921	VII		Pontremoli
1939	VII		Fivizzano - Garfagnana
1987		4.5	Novellara (RE)
1995	VII	4.6	Bassa Lunigiana
1996		4.6	Bagnolo in Piano (RE)
1999		4.6	Sestola
2000		4.5	Novellara (RE)
2008		4.9	Neviano degli Arduini
2008		4.4	Vetto
2012		4.9	Brescello (RE)
2012		4.9	Berceto
2012		5.8	Finale Emilia (RE)
2013		4.8	Castiglione di Garfagnana
2013		5.1	Carrara
2013		4.5	Minucciano
2017		4.4	Varano de' Melegari (PR)

- *Major seismic events in the last three centuries in the candidate area*

SEISMICITY

The Appennino Tosco-Emiliano is affected by frequent earthquakes, although they rarely exceed 6 on the Richter Magnitude Scale. In Emilia, the areas of the provinces of Parma and Reggio Emilia have been affected by seismic events that have not historically produced effects above VIII on the Mercalli Intensity Scale, while in Lunigiana and Garfagnana, events with more serious effects, up to the tenth grade on the Mercalli Intensity Scale, have been recorded. The different extent of the damage recorded in history during events of comparable intensity in the two sectors defined by the ridge, it should be explained with the different lithotypes present in the two areas capable of absorbing similar energy events differently, as well as with the different seismogenic potential of the different tectonic structures present.

11.5. BIOCLIMATIC ZONE

Areas	Average annual rainfall/mm	Aridity index		Core	Buffer	Transition
		Penman	(UNEP index)			
Hyper-arid	P<100	<0.05	<0.05	-	-	-
Arid	100-400	0.05-0.28	0.05-0.20	-	-	-
Semi-arid	400-600	0.28-0.43	0.21-0.50	-	-	-
Dry Sub-humid	600-800	0.43-0.60	0.51-0.65	-	-	-
Moist Sub-humid	800-1200	0.60-0.90	>0.65	-	-	-
Per-humid	P>1200	>0.90		100%	100%	100%

- *Aridity index resulting from the use of Mean annual precipitation (P)/mean annual potential evapotranspiration (ETP) ratio.*

BIOLOGICAL CHARACTERISTICS

Within the Natura 2000 Network on the territory, 50 habitats have been recognised, 14 of which are of Community interest and 6 of regional interest which are treated in this treatment. As many as 12 more habitats of Community interest are provided by the enlargement of the Biosphere Reserve (below in bold). Attached is a description of the individual habitats.

DIRETTIVA DIRECTIVE:

1340	*	Inland salt meadows
3130		Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea
3140		Hard oligo-mesotrophic waters with benthic vegetation of Chara spp
3150		Natural eutrophic lakes with Magnopotamion or Hydrocharition -type vegetation
3160		Natural dystrophic lakes and ponds
3170	*	Mediterranean temporary ponds
3220		Alpine rivers and the herbaceous vegetation along their banks
3230		Alpine rivers and their ligneous vegetation with Myricaria germanica
3240		Alpine rivers and their ligneous vegetation with Salix elaeagnos
3260		Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation
3270		Rivers with muddy banks with Chenopodion rubri pp and Bidention pp vegetation
3280		Constantly flowing Mediterranean rivers with Paspalo-Agrostidion species and hanging curtains of Salix and Populus alba
4030		European dry heaths
4060		Alpine and Boreal heaths
5130		Juniperus communis formations on heaths or calcareous grasslands
6110	*	Rupicolous calcareous or basophilic grasslands of the Alysso-Sedion albi
6130		Calaminarian grasslands of the Violetalia calaminariae
6150		Siliceous alpine and boreal grasslands
6170		Alpine and subalpine calcareous grasslands
6210	*	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)
6220	*	Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea

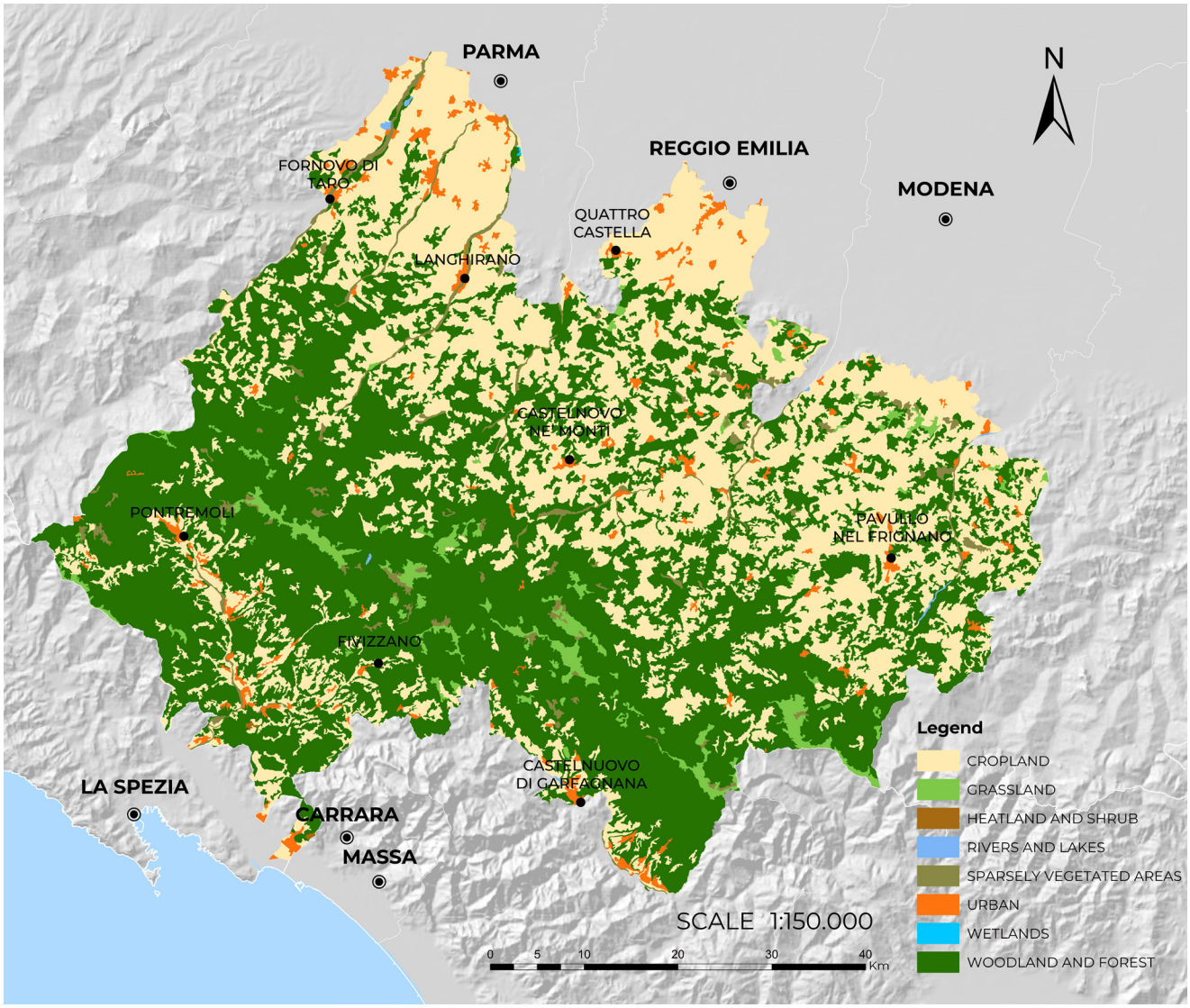
6230	*	Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)
6410		Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)
6420		Mediterranean tall humid grasslands of the Molinio-Holoschoenion
6430		Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels
6510		Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis)
7110	*	Active raised bogs
7140		Transition mires and quaking bogs
7210	*	Calcareous fens with Cladium mariscus and species of the Caricion davallianae
7220	*	Petrifying springs with tufa formation (Cratoneurion)
7230		Alkaline fens
8110		Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)
8120		Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii)
8130		Western Mediterranean and thermophilous scree
8210		Calcareous rocky slopes with chasmophytic vegetation
8220		Siliceous rocky slopes with chasmophytic vegetation
8230		Siliceous rock with pioneer vegetation of the Sedo-Scleranthion or of the Sedo albi-Veronicion dillenii
8310		Caves not open to the public
9110		Luzulo-Fagetum beech forests
9130		Asperulo-Fagetum beech forests
9150		Medio-European limestone beech forests of the Cephalanthero-Fagion
9180	*	Tilio-Acerion forests of slopes, screes and ravines
91AA	*	Eastern white oak woods
91E0	*	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)
91L0		Illyrian oak-hornbeam forests (Erythronio-carpinion)
91M0		Pannonian-Balkanic turkey oak –sessile oak forests
9210	*	Apeninne beech forests with Taxus and Ilex
9220	*	Apennine beech forests with Abies alba and beech forests with Abies nebrodensis
9260		Castanea sativa woods
92A0		Salix alba and Populus alba galleries

HABITAT OF REGIONAL INTEREST:

Cn	Montane subalpine acid fens (Caricetalia nigrae and other associated phytocenosis)
Fu	Hygrophilic meadows and pastures of Filipendulion ulmariae
Mc	Big Carex and Cyperus (Magnocaricion) groves
Pa	Marsh reeds: Reed and tall-sedge vegetation on river banks and fresh-water reed vegetation (Phragmition)
Psy	Apennine pine grove with Pinus sylvestris

HYPOGEAN HABITAT:

Car	Areas with deep widespread karst
Idrocar	Areas of hydrological interest linked to karst



- *Figure 12.1 - Map of ecosystems found in the Reserve and classified according to the MAES system.*

12. ECOSYSTEM SERVICES

12.1. IF POSSIBLE, IDENTIFY THE ECOSYSTEM SERVICES PROVIDED BY EACH ECOSYSTEM OF THE BIOSPHERE RESERVE AND THE BENEFICIARIES OF THESE SERVICES

The territory of the Appennino Tosco-Emiliano provides the inhabitants of the valleys and adjacent flat areas with numerous benefits including healthier air and water sources, protection from floods, recreational opportunities, work, a rich biodiversity as well as absorption and storage significant quantities of CO2 in plants and soil. Sudden climate changes threaten the destruction of some of these services, with serious effects both for the mountain and rural communities of the Appennino, and for the urbanized areas downstream. The monitoring and protection of these ecosystem services is therefore becoming strategic not only for the management bodies of the territories of the Reserve but also for all urban areas, in particular those connected to the territories of the Biosphere Reserve by river axes.

The mapping of the ecosystems present within the Reserve, based on the MAES classification system as to macro-categories, was carried out considering as starting data those contained in the Corine Land Cover 2012 inventory. The choice fell on this tool to maintain a homogeneous evaluation over the whole surveyed area. The reference scale is 1: 100,000 with a minimum mapping unit of 25 hectares. The legend is hierarchically organized according to the detailed classification of the five Corine Land Cover (CLC) categories up to 5 levels; therefore, through a suitable crossing table (Table 12.1) it was possible to base the various land cover categories on the "Ecosystema types" classes (Type of ecosystem - Second level) contained in the "Common International Classification of Ecosystem Services (CICES)". Based on the analysis of the available data, and the indications contained in the "Common International Classification of Ecosystem Services (CICES)", the different types of ecosystems present in the Reserve have been mapped and classified (Fig. 12.1) while a series of information on their extension in the various areas of the Reserve is shown in the following Table 12.2.

Regardless of their presence, distribution and extent, the ability of ecosystems to provide services largely depends on their ability to perform the functions that characterize them, which in turn depends on their state of conservation. Therefore, a brief description of the different macro-categories of ecosystems and some pieces of information on their degree of conservation are reported below.

Corine Land Cover Level			Ecosystem types level 2
1	2	3	
1. Artificial surfaces	1.1. Urban fabric	1.1.1. Continuous urban fabric	Urban
		1.1.2. Discontinuous urban fabric	
	1.2. Industrial, commercial and transport units	1.2.1. Industrial and commercial units	
		1.2.2. Road and rail networks and associated land	
		1.2.3. Port areas	
		1.2.4. Airports	
	1.3. Mine, dump and construction sites	1.3.1. Mineral extraction sites	
		1.3.2. Dump sites	
		1.3.3. Construction sites	
	1.4. Artificial non-agricultural vegetated areas	1.4.1. Green urban areas	
		1.4.2. Sport and leisure facilities	
2. Agricultural areas	2.1. Arable land	2.1.1. Non-irrigated arable land	Cropland
		2.1.2. Permanently irrigated land	
		2.1.3. Rice fields	
	2.2. Permanent crops	2.2.1. Vineyards	
		2.2.2. Fruit trees and berry plantations	
		2.2.3. Olive groves	
	2.3. Pastures	2.3.1. Pastures	Grassland
	2.4. Heterogeneous agricultural areas	2.4.1. Annual crops associated with permanent crops	Cropland
		2.4.2. Complex cultivation patterns	
		2.4.3. Land principally occupied by agriculture, with significant areas of natural vegetation	
		2.4.4. Agro-forestry areas	

Corine Land Cover Level			Ecosystem types level 2
1	2	3	
3. Forests and semi-natural areas	3.1. Forests	3.1.1. Broad-leaved forest	Woodland and forest
		3.1.2. Coniferous forest	
		3.1.3. Mixed forest	
	3.2. Shrub and/or herbaceous vegetation association	3.2.1. Natural grassland	Grassland
		3.2.2. Moors and heathland	Heathland and shrub
		3.2.3. Sclerophyllous vegetation	
		3.2.4. Transitional woodland shrub	Woodland and forest
	3.3. Open spaces with little or no vegetation	3.3.1. Beaches, dunes, and sand plains	Sparsely vegetated areas
		3.3.2. Bare rock	
		3.3.3. Sparsely vegetated areas	
		3.3.4. Burnt areas	
		3.3.5. Glaciers and perpetual snow	
4. Wetlands	4.1. Inland wetlands	4.1.1. Inland marshes	Wetlands
		4.1.2. Peatbogs	
	4.2. Coastal wetlands	4.2.1. Salt marshes	Marine inlets and transitional waters
		4.2.2. Salines	
		4.2.3. Intertidal flats	
5. Water bodies	5.1. Inland waters	5.1.1. Water courses	Rivers and lakes
		5.1.2. Water bodies	
	5.2. Marine waters	5.2.1. Coastal lagoons	Marine inlets and transitional waters
		5.2.2. Estuaries	
		5.2.3. Sea and ocean	Marine

- *Table 12.1 – Corine Land Cover 2012 Land use categories based on the "Ecosystema types" classes (Second level) of the "Common International Classification of Ecosystem Services (CICES)".*

	Core		Buffer		Transition		Whole BR	
	ha	%	ha	%	ha	%	ha	%
Cropland	461.76	2.42	7728.69	15.91	188594.88	43.76	196785.33	39.47
Grassland	4073.57	21.39	3748.30	7.72	4396.98	1.02	12218.86	2.45
Rivers and lakes	39.84	0.21	66.45	0.14	228.58	0.05	334.87	0.07
Sparsely vegetated areas	1539.63	8.08	1131.68	2.33	6902.63	1.60	9573.97	1.92
Urban	11.58	0.06	348.87	0.72	11076.13	2.57	11436.77	2.29
Woodland and forest	12916.93	67.83	35551.27	73.19	219661.60	50.97	268129.80	53.78

- *Table 12.2 – Area covered by each ecosystem.*

TERRESTRIAL ECOSYSTEMS (WOODLAND AND FOREST; CROPLAND; GRASSLAND; SPARSELY VEGETATED AREA)

Given the low importance in the territory under examination (urban areas as a whole cover only 1.45% of the surface), urban ecosystems were not considered in the survey, although these are in fact important areas from the point of view of the functions of the Biosphere Reserve, being centers of aggregation and exchange

The most widespread ecosystems in the Reserve area are forests, which overall cover 60.06% of the land, reaching up to 66.82% and 79.21% respectively in the Core and Buffer Areas. Landscapes predominantly of forests, but characterized by a high diversity of spaces, have characterised the Apennine areas over the centuries, despite the recent increase in forests, especially at higher altitudes or in lands with greater slopes and not suitable for the use of motorized agricultural machinery.

In the territory of the Reserve there are different types of forests, depending on the altitude and the economic management that has taken place over time.

In the Reggio-Parma hilly areas, broad-leaved forests (downy oak, Turkey oak, hop hornbeam), pine forests (Scots pine) and chestnut forests prevail. The Lunigiana hills, on the other hand, are characterised by the traditional presence of specialized crops (olive groves) which alternate, with a rhythm that follows the course of the hills, with chestnut groves and oak and hornbeam trees. The forest has remained in the areas less suitable for the introduction of the olive tree. At higher altitudes we find the chestnut or beech trees, with quercus cerris, and the meadows obtained from beech woods destined for grazing. In Garfagnana, forest ecosystems are mainly located within an intermediate area between the valley floor and the beginning of the mountains marked by the crop change of the land (from the mountain arable land to the prevalence of chestnut and beech trees)

Particular value is recognized to some of the forest areas within the boundaries of the Biosphere Reserve. The beech forest occupies the mountain belt and is typical of the reliefs between 900 and 1,800 m of altitude where it apprears in pure forests. It is mainly young, dense forest for coppicing. The fertility of the soil determines

the height of the beech tree : specimens 25-30 meters high are found only where the soil is deep and fresh. As you go up in altitude, to cope with even the most extreme environmental conditions, the trees progressively reduce their size, until they take on a low and twisted appearance near the limit of the tree vegetation. In the more mature and ancient beech woods, on the other hand, less dense than the younger ones, the beech takes on a majestic appearance, characterized by a powerful trunk and a wide and large crown.

On the south-west side of Monte Cusna, in the territory of the Municipality of Ligonchio (RE), is the Costa delle Veline, known above all for its beautiful beech forest which in the past was frequently cut to produce firewood and which today is one of the most valuable and interesting forests. It is a large forest currently managed in order to transform the pre-existing coppice into a beech forest. The Bosco delle Veline is still in a transitory phase today that, however, characterizes it as unique within the Reserve also due to the presence of some centuries-old trees. The vast area that includes the area between Lagdei and the part of the Alta Val Cedra, in the municipalities of Corniglio and Monchio delle Corti (PR), is an area of great naturalistic and landscape interest. Extending over about 1750 hectares and between 1000 and 1600 meters above sea level, it was purchased in 1914 by the State Agency for State Forests. The beech coppice is the most represented environment within this portion of the Reserve territory, even if there are vast areas of conifers (European spruce and silver fir), planted by the State Forestry Corps (today Arma dei Carabinieri) during a multi-decade reforestation work. Since 1970 part of the state-owned forest (289 hectares) is part of the Riserva Naturale Orientata dello Stato di Guadine-Pradaccio under the direct responsibility of the Carabinieri, while the management of the remaining state-owned forest is the responsibility of the Appennino Tosco Emiliano National Park

The Abetina Reale forest extends on the right side of the Alta Valle delle Dolo up to the Apennine ridge on the border with the Garfagnana. In this coniferous forest of the northern Apennines, indigenous populations survive, relics of the colder climates. The exploitation of the wood from this forest has been documented since the 15th century and has marked this forest until the 20th century. In the 1600s, the Este family built the first hydraulic sawmill here, today transformed into a refuge for hikers. Among the small spontaneous nuclei of secular silver fir, there are examples of artificial planting, derived from the economic activity linked to the sawmill. Among the spontaneous nuclei of precious and stocky secular silver firs, there are examples of anthropic planting -stemming from the economic activity linked to the sawmill – which are surrounded by forests of spruce and other conifers, the result of subsequent reforestation.

With the proposed enlargement, the Biosphere Reserve is enriched by at least two further state-owned forests of considerable size, both located in the Modena area and managed by the Management Body for Parks and Biodiversity of Central Emilia: the Pievepelago-Maccheria Forest (2895 ha, even greater than the Abetina Reale) and the Capanna Tassoni Forest (813 ha). The Parks Authority together with the Unions of Municipalities has been developing forest improvement and conservation interventions for decades; as proof of this, for the two-year period 2017-18 and in relation to the protection and redevelopment actions of its woodland heritage, the Parks Authority has invested the great amount of 324,000 € for the prevention of damage from climate change in S. Annapelago (State-owned forest of Pievepelago -Maccheria) and in Fanano (State-owned forest of Capanna Tassoni). Another state-owned forest included in the Reserve is that of Brattello located close to the pass having the same name in the Municipality of Pontremoli (MS

Chestnut tree cultivation has been for centuries one of the most rooted and widespread forms of nourishment for the Apennine area and represents an element of the typical landscape of the Appennino Tosco-Emiliano Biosphere Reserve

The forest areas are in close continuity with the ecosystems of the grassland and sparsely vegetated area, natural pasture areas and high altitude grasslands, which mainly occupy the higher altitude areas of the Reserve and which reach an overall cover of 4.64% .

In terms of surface extension (34.04% overall) and ecosystem services offered, the agricultural areas that are located in the predominantly hilly areas on both the NE and SW sides of the Reserve are also highly relevant, with different connotations due to the diversity of the climatic areas, and the different types of economic activities. In fact, there is no doubt that, also thanks to the gentler slope, the northern hillside of the Reserve differs in vocation from the southern one, where arboriculture, grazing and horticulture are more developed than the large area covered by forage of the northern side. The presence of areas intended for forage farming is encouraged by the specifications for the production issued by the Consortium of Parmigiano Reggiano PDO, which makes local feeding of livestock a recognized value, so much so that the economic value of ecosystem services in this area is almost explicit. In Lunigiana, cultivated areas are located in the flattest part and in the foothills of the area and are mainly of arable land and horticultural crops. Some hilly areas between 300 and 400 meters amsl are cultivated with olive groves and vineyards. Agriculture has maintained a significant productive value on average throughout history. In Garfagnana, on the other hand, attention was paid to quality mountain arable land, as well as to designations of excellence closely linked to agricultural culture (see chestnut grove).

It should be noted that agricultural areas, in any case constituting ecosystems with a low degree of naturalness, are very poorly widespread in the Core (0.30%) and Buffer (9.11%) Areas.

STATE OF CONSERVATION

To get an overall idea of the state of conservation of the terrestrial ecosystems present in the Appennino Tosco-Emiliano Biosphere Reserve, it is possible to refer to a couple of themes relating to the analysis of the state of conservation and the degree of naturalness of the ecosystems created in the scope of the MAES activities

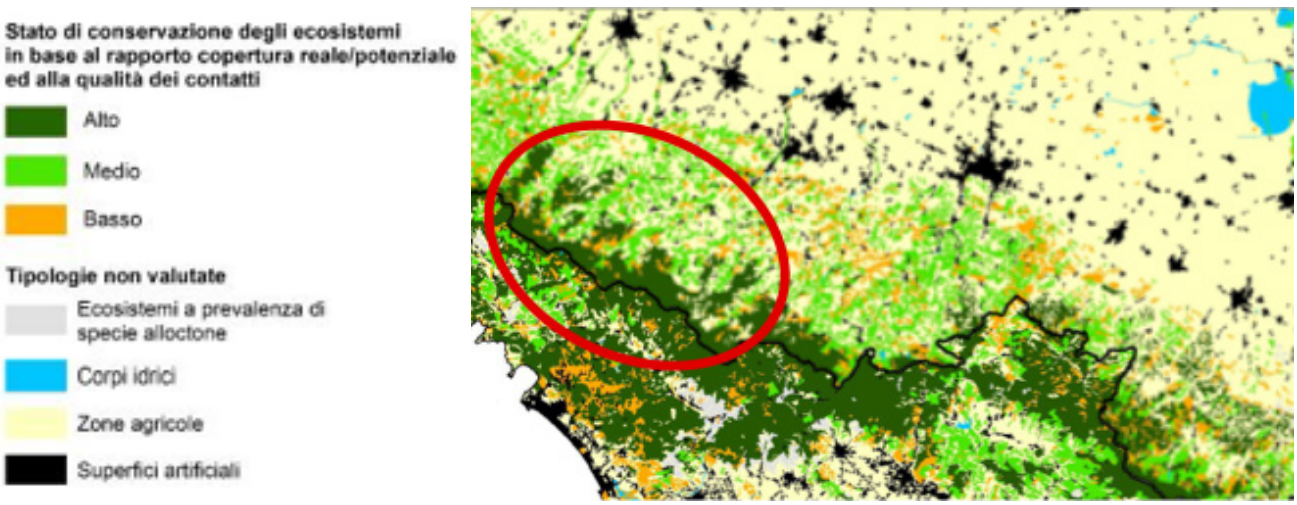
The state of conservation was assessed through the ILC index, Index of Landscape Conservation (Pizzolotto & Brandmayr, 1996). The ILC expresses a concise and easily comparable value with that calculated for the national territory. It is based on the cover of the different environmental quality classes that make up the territorial matrix of the regions. The index ranges from 0 (totally artificial territory) to 1 (territory totally covered by natural surface)

As the following maps show (Figure 2), almost all of the terrestrial ecosystems of the Reserve, excluding urban and agricultural ones, fall within the class of values that are equivalent to a high conservation level.

From the regional summaries (Emilia-Romagna and Tuscany) expressed in the context of the mapping program of ecosystems in Italy and of the support activity for the implementation of the national strategy on biodiversity, the following ecosystems are in a good state of conservation:

- Apennine mountain forest ecosystems dominated by Fagus sylvatica with Abies alba, Taxus baccata, Ilex aquifolium, Acer lobelii, etc.

- Apennine forest ecosystems dominated by Picea abies and / or Abies alba
- High altitude Apennine herbaceous ecosystems (alpine, subalpine and high-mountain ranges) in Sesleria juncifolia, S. nitida, Festuca macrathera, Nardus stricta, Carex kitaibeliana, etc.
- Mediterranean and sub-Mediterranean evergreen peninsular shrub ecosystems with Quercus ilex, Phillyrea latifolia, Arbutus unedo, Erica arborea, Pistacia lentiscus, Myrtus communis, Rosa sempervirens, etc.
- Casmophytic, comophytic and glareicolous Apennine ecosystems
- Among the ecosystems with a medium state of conservation are the peninsular freshwater hygrophilous ones (river banks and wetlands with variable vegetation cover).
- A low state of conservation was found in very small areas of the Biosphere Reserve (see Figure), corresponding to the following ecosystems:
- High-altitude Apennine herbaceous ecosystems (alpine, subalpine and high-mountain belts) in Sesleria juncifolia, S. nitida, Festuca macrathera, Nardus stricta, Carex kitaibeliana, etc.
- Peninsular mountain and hilly herbaceous ecosystems (mountain, submontane and hilly areas) with Brachypodium genuense, B. rupestre, Bromus erectus, Cynosurus cristatus, etc.
- Herbaceous ecosystems in the lower hills and in the Apennine foothills and in the internal peninsular plains of Dasypirum villosum, Avena sp.pl., Trifolium sp.pl., Dactylis glomerata, etc.
- Sub-Mediterranean hilly and Mediterranean coastal peninsular and insular herbaceous ecosystems with Ampelodesmos mauritanicus, Hyparrhenia hirta, Lygeum spartum, Brachypodium retusum, etc.
- Apennine shrub ecosystems (subalpine and mountain bands) with Juniperus communis subsp. alpina, Pinus mugo, Vaccinium myrtillus, Rhamnus alpina subsp. fallax, etc.



- Low-mountain, hilly and lowland peninsular shrub ecosystems in Spartium junceum, Rosa sp.pl., Crataegus monogyna, Juniperus oxycedrus, Prunus spinosa, Rubus ulmifolius, etc.

- Alpine freshwater hygrophilous ecosystems (river banks and wetlands with variable vegetation cover).

It should be noted that all the ecosystems listed are representative of environments strongly under pressure with respect to the climate changes underway and therefore require particular attention in terms of monitoring, especially considering the climatic border area, Mediterranean and continental, on which the Appennino Tosco-Emiliano Biosphere Reserve is located.

Disease and neglect mean that chestnut groves are among the resources in the Apennine cultural landscape that are at greatest risk of deterioration and loss. While chestnut growing is no longer a core part of the mountain economy, its huge heritage of traditions and knowledge lives on in the culture of the local people. There is growing interest and increasingly widespread awareness about it, not so much from a strictly production-based point of view (although PDO chestnut flour is made on the Tuscan side of the Area) as in terms of eco-friendly tourism. For example, the old buildings that were once used for drying chestnuts have now been converted for accommodation purposes and chestnut groves serve as a destination for students and young people on educational and cultural breaks.

Forest areas offer many intangible products and benefits that have important economic, social and environmental impact. One of the environmental benefit is the containment of carbon present in the atmosphere in the form of CO2, a gas potentially capable of altering the climate by increasing the greenhouse effect. The use of woody biomass for the production of thermal energy or, even better, for long-lasting wooden constructions and artifacts, prevents the release of new carbon into the atmosphere, while a careful management of the forest heritage can allow the storage in the forest vegetation and soils of an important portion of the CO2 produced by the industry and the community in general, through the use of fossil fuels.

The increase in the regional forest heritage, consisting for its vast majority of "poor" forests, because intensely exploited until a few decades ago, and privately owned, nowadays implies the need to start new organizational processes with a view to promoting its multifunctional use to support production, environment, landscape and fruition, within the scope of sustainable development.

12.2. SPECIFY WHETHER INDICATORS OF ECOSYSTEM SERVICES ARE USED TO EVALUATE THE THREE FUNCTIONS (CONSERVATION, DEVELOPMENT AND LOGISTIC) OF BIOSPHERE RESERVES. IF YES, WHICH ONES AND GIVE DETAILS.

There are several approaches and methods to map and quantify the ecosystem services provided (or potentially provided). Each of these has strengths and weaknesses, concerning for example the spatial resolution, or the precision of the results, the operational complexity or the amount of data required. To define

priorities and guide strategies for active conservation and management, the qualitative geographic approaches represent a good starting point, considered to be among the most appropriate and easier to apply and use. The ecosystem services associated with each type of ecosystem and their classification according to the four usual procurement / provision categories; regulation and maintenance; life support and values / cultural services is reported below. The choice of which ecosystem services to consider, among the many possible ones, represents a key step in the overall strategy of the Biosphere Reserve (also with a view to activating PES-payment of ecosystem services). Below is an initial cataloging carried out taking into consideration a multiplicity of aspects and according to a rigorous and defined approach also on the basis of the indications available in TESSA:

- the relative importance of the ecosystem service with respect to the territorial, economic and social specificities of the Reserve, for example excluding ecosystem services that are not significant with respect to the context;
- the presence of a relationship between ecosystem services and potential categories of stakeholders.

Ecosystemic services	Ecosystemic process and/or ES supplier component
Provision	
1. Food	Presence of edible plants, animals
2. Water	Drinking water reserves
3. Fibers, fuels, other raw materials	Mineral species or materials with potential use as raw material
4. Genetic materials: genes of resistance to pathogens	Species with potentially useful genetic material
5. Ornamental species	Mineral species or materials with ornamental use
Regulation	
1. Air quality regulation	Ability of ecosystems to absorb chemical compounds from the atmosphere
2. Climate regulation	Influence of ecosystems on local and global climate
3. Mitigation of natural hazards	Protection against damage from destructive events (e.g. floods)
4. Water regulation	Role of forests in rain infiltration and gradual release of water
5. Waste Assimilation	Processes of removal and dissolution of organic compounds and chemical compounds
6. Protection from erosion	Role of vegetation and in particular of roots in soil erosion protection
7. Soil formation and regeneration	Soil formation and regeneration (pedogenesis)
8. Pollination	Abundance and effectiveness of pollinators
9. Biological control	Control of pest populations through trophic relationships (predators or "useful" competitors)
Support	
1. Habitat	Functionality of breeding, feeding and refuge areas for resident and migrating species
2. Conservation of genetic biodiversity	Maintenance of evolutionary processes and biological fitness (on a phenotypic and / or genetic basis)
Cultural	
1. Aesthetics: aesthetic value	Aesthetic quality of the landscape (e.g. structural diversity, tranquility ...)
2. Recreational: opportunities for tourism and recreation	Attractiveness of the "natural" landscape and outdoor activities
3. Cultural heritage and identity	Importance of historical and identification elements for the local community
4. Education and science: opportunities for formal and informal training and education	Characteristics of the landscape, species and vegetation of cultural relevance, with scientific and educational value / interest

- *Table 12.3 - Classification of Ecosystemic Services (from MEA, 2005, p. 28, mod., and de Groot, 2009).*

Classi di servizi ecosistemici (CICES)	Ecosistems (MAES)						
	Woodland and Forest	Cropland	Grassland	Urban	Sparesely vegetated area	Rivers and lake	Ecosystemic services (MEA)
Cultivation and animal husbandry	1	3	1	0	0	0	PROVISION
Forage-grazing	1	2	3	0	0	0	
Wildlife resources	3	1	3	0	1	2	
Raw materials	3	1	0	0	0	0	
Mushrooms	3	0	1	0	0	0	
Medicinal plants	2	1	3	0	0	0	
Genetic resources	3	1	3	0	0	0	
Drinking water	1	0	0	0	0	3	
Carbon sequestration	3	1	2	0	0	1	REGULATION
Air purification	3	1	1	0	1	1	
Water regulation	3	1	2	0	1	3	
Water purification	3	0	3	0	0	1	
Protection against erosion and geological instability	3	0	3	0	0	0	
Protection against hydrological instability	3	0	1	0	2	2	
Pollination	3	2	3	0	0	0	
Biological control	3	0	2	0	0	0	
Habitat for biodiversity	3	0	3	0	1	3	SUPPORT
Aesthetic value	3	2	3	1	3	3	CULTURAL
Recreational Value	3	0	3	2	3	3	
Cultural value	3	2	3	3	2	3	

It is clear that this list could be reduced / integrated during the phases of the process for the implementation and management of the Action Plan of the Reserve, in order to define and quantify a set of ecosystem services that are truly representative of the context and useful for promoting strategic actions (also through the payment of ecosystem services). Within the 2016 report on the payment of ecosystem services, as part of the 2014-16 agreement between the Emilia-Romagna Region and ERVET (Emilia-Romagna Economic Valorisation of the Territory SpA), it is noted that the most important PES, from an economic point of view and by extension, is related to the pricing of the integrated water service. In this regard, the Italian national legislation provides that part of the tariff includes the environmental costs of the service and the Regional decree ER no. 933 of 9 July 2012 "(Addresses and guidelines relating to the management of the areas underlying the water basins that feed the systems of withdrawal of surface and groundwater in the mountain territory and of the safeguarded areas "), specifies its implementation on a regional scale.

Each type of land cover (CORINE 2012 data), subsequently referred to the "Type of ecosystem" level (Second level, as described above) contained in the "Common International Classification of Ecosystem Services (CICES)", has been assigned a level of potential provision of ecosystem service, based on the biodiversity or particular ecological function expected for that cover (parameters established by the LIFE Making Good Natura project). Assuming a proportionality between expected biodiversity and ecosystem services, qualitative levels of potential provision are defined, according to the following scale:

- 3 - very relevant
- 2 - moderately relevant
- 1 - with some relevance
- 0 - with no significant relevance

By comparing the different ecosystem services, it was possible to define a provision classification to identify the most important ecosystem services for the Reserve. Given the large percentage of forest area (60.06%) with a good degree of conservation, as illustrated above, it will primarily have the following relevant capacities::

- Wildlife resources: capture or killing of wild and non-wild animals, for the supply of food, skins and trophies, but also for recreational, commercial or for the containment and management of a species
- Raw materials (wood, fibers, etc.): woody material that can be taken from forest areas for a variety of uses, such as wood for work, domestic consumption (firewood)
- Mushrooms, berries, non-wood products: edible vegetable and non-vegetable species
- Genetic resources: genes and genetic information used for animal breeding, plant improvement and biotechnology
- Carbon sequestration (Carbon Stock): sequestration and storage of greenhouse gases by trees and plants
- Air purification: regulation of air quality through the filtration of harmful substances in the atmosphere by vegetation
- Water regulation, groundwater recharge: regulation of the timing and extent of water outflow and recharge of aquifers, with an impact on the availability of water for the ecosystem
- Water purification: filtration and decomposition of organic residues and pollutants in the water
- Protection from erosion and geological instability (landslides, instability): conservation of the soil and soil fertility; stabilization

- Protection from hydrological instability (floods): ability to reduce extreme events such as floods by forest areas, which can decrease and slow down surface runoff
- Pollination: service mainly provided by insects and essential for the development of fruits, vegetables and seeds
- Biological control: natural control of pests and vector-borne diseases that attack plants, animals and people
- Habitat for biodiversity: provision of environments essential for the survival of animals (food, water, shelter). Each ecosystem has different habitats that can be essential for the life cycle of a species. Some habitats have a very large number of species, which makes them more genetically diverse than others.
- Aesthetic value: beauty and aesthetic values of wildlife in all its physical characteristics perceived by the human eye
- Recreational value: recreational and relaxation opportunities offered by ecosystems
- Cultural value (inspiration for culture, art, educational and spiritual values): spiritual, religious, aesthetic, "existence" values attributed by people to ecosystems, landscapes, animal and plant species

There is a prevalence of ecosystem services of a cultural nature, which include non-material benefits such as cultural heritage and identity, spiritual and intellectual enrichment, aesthetic and recreational values. This is clearly consistent with the characteristics of the Reserve : thanks to the many attractions connected to the beauty and naturalness of the places, the Reserve has a right educational and tourist vocation, with a strong interaction between inhabitants, operators, visitors, landscapes and ecosystems. Such interaction allows to make the most of ecosystem services related to aesthetic aspects (landscape), to the direct interaction with ecosystems (excursions, wildlife watching, food and wine, etc.) and to the study of human interactions with climate change in progress. This, again from a cultural point of view, is accompanied by ecosystem services included in highly natural areas and / or included in protected areas such as wildlife education and the values of environmental assets conservation for future generations.

In terms of services related to the supply of primary and productive goods (supply / production), the topic of the supply of water for human consumption (drinking water) was considered, which has always reflected a delicate balance for the Apennine territories, the production of wood and the production of high quality agricultural products (PDO), such as the fodder for the product that is perhaps most related to the collective imaginary of the territory, the Parmigiano Reggiano cheese.

ES Classes	Beneficiaries	BR function	Supply evaluation	Type of ES
Agricultural and zootechnic activities	Farmers, Restaurants, Citizens, Food and Wine producers	development	The supply of food products can be determined on the basis of the average productivity of the areas (by type of product), which can generally be obtained from statistics (e.g. ISTAT Agricoltura) or from local registers (agricultural associations or consortia). The service has a value equal to the value of the products supplied at the average market price, this can be obtained from the relative prices per food group (source ISMEA).	**PROVISION**
Forage pasture	Farmers, breeders, Restaurants, Parmigiano Reggiano Consortium, Tourism employees	development	The most precise quantification of the supply is based on the data of average annual production of forage in forage or pasture areas within the site.	
Fauna resources	Hunters and fishermen, Tourism operators, Park Authority	logistic and conservation	Censuses or catch registers. The benefits extend outside the site, to all "ecologically connected" territories; huntable species can be considered "umbrella" species and indicators of environmental quality; actions for the conservation and natural increase of their populations can have repercussions on other species, even non huntable ones.	
Raw materials	Handicraft (processing), Residents (firewood)	development and conservation	Annual productivity = $\sum\sum ai,r \times \sum lci,r$ where: a = forest area with prevalence of species (i) in the region (r) included in the site; Ic = current increment per species/groups of species (i) and per region (r)	
Mushrooms	Professional gatherers, Residents, Tourists	development	The productivity of forests for mushrooms and truffles is very variable depending on local conditions (e.g. microclimate, soil, vegetation) but also on the intensity of harvesting and other disturbances; therefore, in the absence of direct data (e.g. census collectors or licenses) it would not be correct to generalize any local productivity data.	
Medicinal plants	Gatherers, Pharmacological research	conservation	The evaluation of supply requires census data on medicinal plants (e.g. botanical surveys).	
Genetic resources	Farms breeding or grazing at the site of growth of endemic genetic types or cultivation of local varieties/cultivars (plant genetic resources), Research bodies, Protection bodies, Citizenship	conservation	The maintenance service of indigenous genetic types (TGA) and plant genetic resources (RGV) is often local and limited to traditional contexts, while direct fallout may affect the regional level, with global benefits. Being a service resulting from the set of particular environmental practices and conditions, the evaluation of the offer can be made only in the presence of specific direct data deriving from specific registers of species or varieties.	
Drinking water	Population living in the areas of the river basins, Mineral water industry	conservation and development	The evaluation of the offer can be calculated from the analysis of the hydrological balance of the area in question, using hydrological models or simple estimates of the basin flow rate (precipitation - evapotranspiration). An indirect quantification can be based on the total drinking water withdrawals (for civic uses) in the area.	

Carbon sequestration	Society in general, CO_2 Emitters	conservation	The amount of C immobilised in the wood mass (carbon storage) or as a process (annual rate of seizure) can be assessed.	**REGULATION**
Air purification	Residents (emitters of air pollutants) near the Reserve area	conservation	An estimate of PM10 sequestration based on average annual catch coefficients by vegetation type, in terms of kg/ha, can be assessed according to different methods illustrated in the literature.	
Water regulation	Resident population in the areas of the river basins, Farmers	logistic and conservation	An ideal approach would estimate the movement of volumes between atmosphere, surface and subsoil through precipitation, evapotranspiration, infiltration and surface flow, including local phenomena such as snowfall, frozen surfaces and thaw.	
Water purification	Residents in -, or downstream, areas of diffuse pollution production	conservation	The service depends on functional ecosystems that are interposed between the polluting sources and the receptor bodies and their beneficiaries.	
Protection from erosion and geological instability	Residents in hydrogeological risk areas	logistic and conservation	The erosion protection service can be approximated in terms of potential erosion avoided by providing a map of potential erosion and defining the specific contribution of the areas.	
Protection from geological instability	Residents in flood risk areas	logistic and conservation	To precisely quantify the service it is necessary to use hydrological models on a basin scale capable of estimating flood events, define the infiltration rate during exceptional rainfall events (10-year historical series) and identify areas at risk of flooding.	
Pollination	Farmers with cultivations close to functional habitats for pollinators, Society in general, Tourism	conservation adn development	The demand can be quantified in terms of cultivated area (ha) or number of farms in need of pollination, using data on cultivated areas within a certain distance from the BR.	
Biological control	Farmers with crops in the vicinity of functional habitats for biological species-controllers	conservation and development	Knowledge about the biological relationships between useful and harmful species is still very limited and essentially developed only for a few types of crops (some arable crops). In the literature, numerous studies prove the existence of biological control rather than quantification (Griffiths et al. 2008).	
Habitat for biodiversity	Population	conservation	A simplistic quantification of the service consists in counting species and habitats present on the site, or potentially present. For a qualitative assessment, attributes such as rarity and vulnerability can be considered.	**SUPPORT**

ES Classes	Beneficiaries	BR function	Supply evaluation	Type of ES
Aesthetic value	Residents and tourists in the visibility area	development and conservation	A landscape evaluation questionnaire is proposed, which can make explicit preferences through photos, reproducing the various types of habitats and/or various possible scenarios with the substitution of undesirable elements and the presence of undesirable elements. The preference values obtained from the questionnaire, referring to each type of land cover, can then be extended over larger areas and on a qualitative map.	**CULTURALE**
Recreational value	Residents and tourists	development	A census of the main outdoor activities (and their area extension) offered in the Reserve area, the attractions (natural and cultural monuments, amenities...) that can be visited and any access limits.	
Cultural value	Society in general, Residents of the Municipalities of the Reserve	development and conservation	Difficult to evaluate. It is proposed to submit a questionnaire to managers and residents in which they are asked to identify the points or areas where certain values/services are found, the degree of appreciation, etc.. The data obtained may be indicated directly on a map.	

EVALUATION OF ECOSYSTEM SERVICES: BENEFICIARIES, FUNCTIONS IN THE RESERVE AND POSSIBLE QUANTIFICATION PARAMETERS

The Natural Capital of a territory - the various Ecosystem Services (SE) - constitutes the basis of social well-being and sustainable economic development, therefore it is essential to be aware of it and make the most of it. This knowledge is fundamental, for example, to define the compatible uses of natural resources and the management strategies that can preserve and possibly increase their availability and value in the medium and long term.

The three functions of the Biosphere Reserve and the associated ecosystem services are indicated in the previous Table.

The same table also describes the primary beneficiaries of the services and some possible indicators identified to quantify the availability of each ecosystem service.

12.3. DESCRIBE BIODIVERSITY INVOLVED IN THE PROVISION OF ECOSYSTEMS SERVICES IN THE BIOSPHERE RESERVE (E.G. SPECIES OR GROUPS OF SPECIES INVOLVED).

On the basis of existing knowledge (see in particular the Regional Environmental Forest Plan and the Management Plans of the SCIs, SPAs, National Park, Regional Parks and other Protected Areas) concerning animal species and habitats, the species or groups of species or habitats on which the ecosystem services identified depend most are illustrated in Table 12.4 (next pages).

Ecosystemic services classes (CICES)	Biodiversity (examples of species or groups of species, habitats, coltural varieties)	Type of ES
Agricultural and zootechnic activities	Farro from Garfagnana Triticum dicoccum (Schubler) Chestnuts of the following varieties: Carpinese; Pontecosi; Mazzangaia; Pelosora; Rossola (rossolina, rossarda, rossale, rosetta, rosellina); Verdola (verdarella, verdona); Nerona (gragnanello, bocca storta, morona); Capannaccia (capannaccina, insetina). Apis mellifera. Reggiana Red Cow. Vitis vinifera Sangiovese, Trebbiano toscano, Vermentino, Albarola. Ventasso Saffron. Cornigliese sheep.	PROVISION
Forage pasture	Mesophilic hay meadows of the montane and subalpine belts, generally dominated by Trisetum flavescens, accompanied by grassland species similar to the Polygono-Trisetion. Species present in hay meadows distributed from the plain up to 800- 1000 m, which can be classified in the Salvio-Dactyletum, characterized by the presence of numerous tall grasses, including Arrhenatherum elatius, Dactylis glomerata, Festuca pratensis, Trisetum flavescens, Holcus lanatus, Anthoxanthum odoratum, Alopecurus pratensis, Phleum pratense and Poa pratensis. Among other species, leguminous plants are quite common, including Trifolium pratense, T. repens, T. campestre, Vicia sativa, Onobrichys viciifolia, Lotus corniculatus and the composites, including Leucanthemum gr. vulgare, Achillea gr. millefolium, Leontodon hispidus, Crepis vesicaria, Centaurea nigrescens and Tragopogon pratensis. Salvia pratensis, Lychnis flos-cuculi, Rhinanthus alectorolophus, Plantago lanceolata, Prunella vulgaris, Galium verum and Daucus carota complete the list of the most frequent species.	
Fauna resources	Roe deer, deer, wild boar; trout.	
Raw materials	Conifers (silver fir, spruce); broad-leaved trees (mesophilic and mesothermophilic such as maple, ash, Hop Hornbeam and manna ash trees); exotic conifers (Douglas fir, Mopnterey pine and Weymouth pine trees); exotic broad-leaved trees (robinia, ailanthus); deciduous oaks (such as Turkey, downy, Italian, Durmast and English oaks); beech trees; chestnut trees; hygrophytes (willows, poplars, alder trees).	
Mushrooms	Edible mushrooms (ex. porcini Boletus aestivalis; Boletus edulis	
Genetic resources	Within the Biosphere Reserve there are at least 122 species of birds, amphibians, fish and invertebrates of community conservation interest, 3 of which are of priority interest. The presence of: Wolf, Golden Eagle (National Red List of Threatened species, Red List of Emilia-Romagna as a endangered species), Crested Newt, Spectacled Salamadrina, Fire salamander, Rana temporaria, various species of chiroptera, Osmoderma eremita, beetle of priority interest. Refer to the regional Germplasm Bank for the safeguarding of cultivated biodiversity. Acidophilous heaths with Calluna vulgaris, often rich in species of the genera Vaccinium, Genista and Erica. Floristically very rich phytocoenoses, dominated by grasses, first of all Brachypodium rupestre and Bromus erectus. Among the most frequent species are Knautia purpurea, Dorycnium pentaphyllum, D. hirsutum, Hypericum perforatum, Arabis hirsuta, Carex flacca, Carlina vulgaris, Polygala nicaeensis, Sanguisorba minor, Lotus corniculatus, Medicago lupulina and numerous orchids such as Ophrys apifera, O. O. fuciflora, O. fusca, O. sphegodes, Orchis purpurea, O. morio, O. mascula, Anacamptis pyramidalis, Gymnadenia conopsea, etc.	
Drinking water	There are no particular groups of species	

Ecosystemic services classes (CICES)	Biodiversity (examples of species or groups of species, habitats, coltural varieties)	Type of ES
Carbon sequestration	Conifers (silver fir, spruce); broad-leaved trees (mesophilic and mesothermophilic such as maple, ash, Hop hornbeam, manna ash trees); exotic conifers (Douglas fir, Monterey pine and Weymouth pine trees); exotic broad-leaved trees (robinia, ailanthus); deciduous oaks (turkey oak, downy oak, farnetto, oak, English oak); beech trees; chestnuts; hygrophytes (willows, poplars, alder trees).	REGULATION
Air purification	Conifers (silver fir, spruce); broad-leaved trees (mesophilic and mesothermophilic such as maple, ash, Hop hornbeam, manna ash trees); exotic conifers (Douglas fir, Monterey pine and Weymouth pine trees); exotic broad-leaved trees (robinia, ailanthus); deciduous oaks (turkey oak, downy oak, farnetto, oak, English oak); beech trees; chestnuts; hygrophytes (willows, poplars, alder trees).	
Water regulation	There are no particular groups of species	
Water purification	There are no particular groups of species	
Protection from erosion and geological instability	Example of Sedum album on gypsum formations, framed in the Cladonio-Sedetum hispanici combination, characterized by the prevalence of minute fleshy perennial herbs including species of the genus Sedum (S. album, S. sexangulare, S. hispanicum, S. rupestre, S . maximum and S. acre), Sempervivum tectorum, and small annual seedlings (Alyssum alyssoides, Cerastium spp., Teucrium botrys, Saxifraga tridactylites, Aegilops geniculata, Petrorhagia saxifraga, Geranium molle, Catapodium rigidum), as well as mosses and lichens (Cladonia pyxidata , Tortula ruralis and Peltigera canina. Sometimes this habitat interpenetrates with other vegetational typologies (especially Festuco-Brometea in which species of the Thero-Brachypodietea can also be included) and this occurs where the gypsum crumbles and a first layer of soil starts forming.	
Protection from geological instability	There are no particular groups of species	
Pollination	Various species of pollinating insects	
Biological control	Example of the case of the “Asian chestnut gall wasp” (Dryocosmus kuriphilus), for which antagonistic species have been introduced to protect chestnut groves.	
Habitat for biodiversity	In the territory of the Reserve, at least 50 habitats of community interest have been designated, of which 14 are priority and 6 are of regional interest.	SUPPORT
Aesthetic value	The significant diversification of the agricultural mosaic in the middle slopes of the valleys due to the alternating combination of arable land, grazing areas, portions of forests, vineyards on cliffs and edges.	CULTURAL
Recreational value	It is to be attributed to the general groups of species present and associated characteristics, so there are no particular groups of species.	
Cultural value	It is to be attributed to the general groups of species present and associated characteristics, so there are no particular groups of species.	

12.4. SPECIFY WHETHER ANY ECOSYSTEM SERVICES ASSESSMENT HAS BEEN DONE FOR THE PROPOSED BIOSPHERE RESERVE. IF YES, IS THIS ASSESSMENT USED TO DEVELOP THE MANAGEMENT PLAN?

The study and research described in this document are included in the Biosphere Reserve Management Plan as a fundamental basis to ensure the correct attribution of the intrinsic value of these places and their potential.

13. MAIN OBJECTIVES FOR THE BIOSPHERE RESERVE'S DESIGNATION

13.1. DESCRIBE THE MAIN OBJECTIVES OF THE PROPOSED BIOSPHERE RESERVE, INTEGRATING THE THREE FUNCTIONS (CONSERVATION, DEVELOPMENT AND LOGISTIC), PRESENTED BELOW (SECTIONS 14 TO 16), INCLUDING COMPONENTS OF BIOLOGICAL AND CULTURAL DIVERSITY. PLEASE SPECIFY THE INDIRECT PRESSURES AND/OR ORGANIZATIONAL ISSUES.

THE SPECIFIC OBJECTIVES OF THE CONSERVATION FUNCTION OF THE APPENNINO TOSCO-EMILIANO BIOSPHERE RESERVE ARE THE FOLLOWING:

- To preserve and renew the historical balance between man and biosphere in the Tuscan-Emilian Apennines, which is nowadays progressively neglected by man and threatened by climate changes and cultural homologation, i.e. trends which the current naturalistic protection measures can only control in specific sectors and without a holistic approach.
- To protect biodiversity, ecosystem processes and green infrastructures and to control allochthonous species whose number tends to increase. These objectives are connected to the conservation of numerous habitats and species (in particular the habitats and the species of the Natura 2000 sites). With the enlargement, great attention is paid to the protection of ecological corridors between urban, peri-urban, rural and mountain areas an important component of which is represented by waterways.
- The high social and climatic diversity of the area led to a fragmented production of numerous niche products (among which 20 PDO products.; 20 PGI products.; and 8 Slow Food Presidia classified by the Ministry of Agriculture). In some cases, they are real sociological archetypes, historically characterised by self-production and self-consumption, which are nowadays threatened by the depopulation of mountain areas and the homologation of food habits. The objective of the Reserve in this area is therefore to preserve both practices and raw materials associated with these products of excellence. It should be noted that with the enlargement of the Reserve proposed here, essentially thanks to the enlargement in the Modena area, the number of niche products of guaranteed quality is going to be increased, therefore strengthening the Reserve thanks to 3 PDO products (Lambrusco Grasparossa wines from Castelvetro, Modena and Pignoletto) and 2 PGI products (Amarene Brusche di Modena, Ciliegia di Vignola), in addition to the 13 products belonging to the "Tradition and flavors of Modena" list (Modena Chamber of Commerce), 1 Slow Food presidium.
- To protect social and cultural diversity, i.e. the material culture and the set of values and traditions connected to an age-old deep relationship of the small Apennine communities with the land and seasons. This relationship has loosened over decades because of the growing economic, logistic and cultural subordination compared with the most populated, industrialised and urbanised areas in the North and the South of the Reserve. In this case,

protection means combating ignorance and disaffection (young people) and overcoming simple nostalgia for the past (elderly people). Valorising and giving new motivation to human resources towards a future of high sustainability and quality of the relationship between man and territory (biosphere) must be understood as the basis for spreading new practices and attitudes such as "taking care" and "being proud" of living in the places included in the area proposed for the enlargement of the Biosphere Reserve.

- Build a relationship -and feed it continuously with communication and knowledge, creation of cultural stimuli, training courses- between the communities settled in the mountain villages and those, more numerically representative, of the hilly area down to the urban agglomerations, to harmonize a unitary contribution of the population of the Biosphere Reserve to the conservation objectives and therefore enhance their feasibility.
- To combat hydrogeological instability, which is mainly a natural process, a dynamic component of the relationship between geosphere, biosphere and anthroposphere. However, both in reference to the anthropic component responsible for the ongoing climate changes, and in reference to the abandonment of balanced land use practices, we are witnessing a worsening of the pressures and criticalities caused by hydrogeological instability (landslides, floods, erosion). In the last 50 years the spreading of practices targeting environmental assets modification through planning and land use has been weakening for decades the practice of listening to the land and of taking deep care of it. The negative effects are found only in part on the component of biodiversity which manages to trigger forms of resilience and adaptation by sometimes proving to be even strengthened or more generally enriched. Negative effects on the contrary are reflected in a clearer and more defined way on the anthropic component in relation to the built areas and road infrastructures and consequently on the solidity of economic models
- To monitor climate changes: in a territory such as the Tuscan-Emilian Apennines on the border between two different climate zones (Mediterranean - Continental) which thus represent an area particularly sensitive to global warming effects, which affect both ecosystems balances and mountain animal and plant species, this action is extremely important and meaningful for monitoring actions and for planning efficient mitigation actions and parallelly starting a resilience process involving the entire community, by studying the phenomenon precisely where it occurs and experimenting with the most appropriate responses. In order to cope with climate change, the Biosphere Reserve will also have to target: the conservation of the soils, of the supra-temperate belt wild habitats of the ridge areas, the lake habitats, the quality of the lotic waters, the historical landscapes of the pastures, the high altitude clearings, and the medium-altitude chestnut groves; the improvement of the quality of woods, as to structure and composition.

These objectives are aimed at achieving the following goals for Sustainable Development of the United Nations 2030 Agenda: 6 (clean water and sanitation); 7 (affordable and clean energy); 11 (sustainable cities and communities); 13 (climate action); 14 (life below water); 15 (life on land); 17 (partnerships for the goals).

THE SPECIFIC OBJECTIVES OF THE DEVELOPMENT FUNCTION OF THE APPENNINO TOSCO-EMILIANO BIOSPHERE RESERVE ARE THE FOLLOWING:

- Preserving and upgrading the landscapes linked to traditional agro-sylvo-pastoral activities, which are nowadays at risk of reduction or abandonment, for example the Parmigiano Reggiano PDO hill pasture areas, ridge grazing lands and terracing in Lunigiana and Garfagnana. "Cultural landscapes" underlying ecosystems that function in harmony with quality human activities; good quality physical resources and processes that form the natural capital in which we have to invest for the future. Generating widespread income, through the upgrading of these elements, will allow the various objectives to be combined in the territory protected by the Appennino Tosco-Emiliano Biosphere Reserve.

- Extensive and quality mountain agriculture: in agriculture the recovery and protection of social and cultural diversity connected to the characteristics of the territory are elements able to counteract well-known phenomena in marginal rural areas, such as unemployment, the disaffection of young people, population ageing, depopulation, abandonment of the protection and care of the woods and grasslands with consequent fragility for the whole territory and loss of biodiversity. Hence, making the most of socio-economic diversities intended as a pool of competencies means: supporting endemic and quality productions (PDO, DOCG Guaranteed and Controlled Designation of Origin, PGI etc.), organic agriculture and sustainable forestry; promoting the multifunctional role of agriculture (in particular with respect to land conservation, the production of renewable energy and the rural tourism offer); encouraging a return to micro-farming also by rediscovering or valorising "new heirloom" crops.

- Sustainable tourism: the awareness, based on the principles of the European Charter for Sustainable Tourism in Protected Areas (ECST), of the importance of reducing and managing the environmental impact of the tourist flows; the development of eco-tourism and naturalistic tourism (with relation to school and scientific tourism too); attention to territory accessibility for a correct and inclusive use; support to forms of Community Responsible Tourism; an innovative offer (e.g. short and differentiated stays, experiential tourism, ...) throughout all seasons and all over the territory also with a view to changing the traditional tourist offer structure into a bi-seasonal one; support for the relationship between tourism and the Agri-food sector; the active cooperation with the 4 LAGs present in the area (Ducato LAG, Antico Frignano and Appennino Reggiano LAG, Consorzio Lunigiana LAG, Montagna Appennino LAG) which in their Local Action Plans (LAP) and Integrated Local Development Strategies (LDS) have identified actions regarding sustainable tourism as priority objectives for the area.

- Fostering culture and history: in order to highlight the history of the intrinsic relationship between man and biosphere through the signs and the study of past ages, such as the stele statues of Lunigiana, the remains of the Ligurian settlements, the heritage of castles and parish churches dating back to the Matilda of Canossa period, the palazzi of the Malaspina, Este and Vallisneri families, the "Maggio", the modern age, from the Italian Risorgimento which led to unification and the Resistance fighting, until today. This must be aimed at highlighting the common and interdependent aspects of the historical evolution mentioned above between the populations of the foothills and

those of the mountain ridge territories, with the aim of strengthening the cultural foundations of an integrated sustainable development and the interchange of ecosystem services.

These objectives are aimed at achieving the following goals for Sustainable Development of the United Nations 2030 Agenda: 1 (no poverty); 2 (zero hunger); 3 (good health and well-being); 5 (gender equality); 8 (decent work and economic growth); 10 (reduced inequalities) 12 (responsible consumption and production); 16 (peace, justice and strong institutions); 17 (partnerships for the goals).

THE SPECIFIC OBJECTIVES OF THE LOGISTIC SUPPORT OF THE APPENNINO TOSCO-EMILIANO BIOSPHERE RESERVE ARE THE FOLLOWING:

- Investigating and monitoring biodiversity and abiotic factors by strengthening the network of collaboration and the memoranda of understanding, the qualified research laboratory of the neighbouring universities and Research Centres (and not only) in order to extend the knowledge base and to set up a monitoring network that can provide clear input for the protection and development function of the Biosphere Reserve. It will be necessary to stimulate field research in order to improve, thanks to innovation, the paradigms used in this territory especially as regards infrastructure and the field of communication in the agriculture and tourism sectors. The Tuscan-Emilian Apennines are characterised by a complex mosaic of habitats and ecosystems, whose fragile balance is subject to multiple anthropic and natural pressures. It therefore seems important to examine these aspects in depth and to create scenarios on the effects that these pressures might have in the medium-to-long term through suitable monitoring plans. Those connected to the presence of rare species are the most relevant both as regards fauna and flora and the dynamics connected to forestry. Particular emphasis will be given to the monitoring of the economic aspects of the territory of the Tuscan-Emilian Apennines in particular as regards energy production and transport, the use of resources and land, the tourism carrying capacity, the ecological footprint and the environmental accounting aimed at defining ecosystem services increasingly accurately. It will be of course strategic and appropriate to continue to investigate climate issues.

- Education on sustainability, intended as education to respect nature as well as knowledge of the territory vocations and attachment to the territory looking towards the future. Education programs have been and will be extended primarily to the entire local population and, in particular, to specific categories, that are of strategic importance for the area and its activities, such as farmers, tour operators as well as traditional categories like teachers and students, for which exchanges and networking between schools will be strategic; educational programmes will also be proposed outside the boundaries of the Reserve and they will be aimed at visitors. Within the Reserve, thanks to the enlargement, the field of human resources through which and for which to implement educational and knowledge processes for sustainability is significantly extended, thus constituting a new main strength for the implementation of the related objectives.

- Governance strengthening and improvement: through an updated unitary vision being authoritatively and widely shared, the designation as a UNESCO MaB Area could significantly strengthen

the coordination and the integration between planning and programming actions provided for in the different territorial plans and programmes in force. The MaB reserve is (and will be for what concerns the current proposal of enlargement) an important tool for territorial cooperation (to create and act as a network) between the two Reserve slopes towards the creation of wider and more global relationships and the achievement of more in-depth knowledge and competences, starting from public authorities and local players.

These objectives are aimed at achieving the following goals for Sustainable Development of the United Nations 2030 Agenda: 4 (quality education); 5 (gender equality); 9 (industry, innovation and infrastructure); 11 (sustainable cities and communities); 12 (responsible consumption and production); 13 (climate action) 14 (life below water); 15 (life on land); 17 (partnerships for the goals).

All the objectives described are aligned with some important indications contained in the Lima Declaration and specifically the points: 19, 20, 24, 25, 26 are reported.

Finally, all the objectives described are aligned with the contents of the Lima Action Plan and some of the actions carried out and practices implemented in the frame of the young management of the Reserve, designated in 2015, are to be underlined in the future perspective of extending these actions and programs also to the Municipalities involved in the enlargement process.

13.2. DESCRIBE THE SUSTAINABLE DEVELOPMENT OBJECTIVES OF THE BIOSPHERE RESERVE.

With reference to the recognition of the Biosphere Reserve and the new enlargement proposal, the guidelines that emerged from the UN RIO + 20 conference and the UN-2030 Agenda, the local administrations and the Park Authorities of the territory have renewed their convinced and common political commitment to ensure a future oriented to sustainable development through the adoption of the Sustainable Development Goals. For the Tuscan-Emilian Apennines, this mainly means promoting a strong cultural development, in the name of the values of sustainability and in-depth and widespread knowledge of the vocations of the territory and, also, being able to maintain and develop a governance based on collaborative models (the governance of the Biosphere Reserve), being apt to promote and support the transition to a greener and fairer economy.

Reserve's attitude is to initiate and conduct processes that lead to a higher and more widespread knowledge (especially in the field of tourism and agriculture), in order to introduce and strengthen new economies and therefore counteract the territory abandonment and spoiling, but also as a source of business motivation and of satisfaction of local community social needs.

13.3. INDICATE THE MAIN STAKEHOLDERS INVOLVED IN THE MANAGEMENT OF THE BIOSPHERE RESERVE

Thanks to the expressions of interest and appreciation that the nomination for designation received during the participatory process related to its drafting and the progressive involvement of the Municipalities not included in the first perimeter (Reserve designated in 2015) which led to considering enlargement, the stakeholders involved in the management of the Biosphere Reserve will be the following (taking into account both the institutional authorities and other relevant public or private stakeholders):

- The Appennino Tosco-Emiliano National park;
- 3 Regions: Liguria, Tuscany and Emilia-Romagna;
- 3 Regional Bodies for the Management of Parks and Biodiversity (Central and Western Emilia)
- The Italian State Corps of Carabinieri
- 80 Municipalities
- 13 Unions of Municipalities (Mountain Union of the East Parma Apennines, Union of the Hills of Canossa, Tresinaro Secchia Union, Union of the Municipalities of Val d'Enza, Mountain Union of the Municipalities of the Reggio Emilia Apennines, Pedemontana Parmense Union (Parma Foothill Union), Union of the Mountain Municipalities of the Dragone, Dolo and Secchia Valleys, Union of the Municipalities of Garfagnana, Mountain Union of the Municipalities of Lunigiana, Union of the Municipalities of Frignano, Union of the Municipalities of the Taro and Ceno Valleys; Terre di Castelli Union (Union of the Lands of Castles); Unione Comuni Distretto Ceramico (Union of the Municipalities of the Ceramic District)
- 6 Provinces (Parma, Reggio Emilia, Modena, Lucca, Massa Carrara, La Spezia)
- The Fondazione Reggio Children (Reggio Children Foundation);
- The Chambers of Commerce, Industry, Craft and Agriculture (CCIAA) of Parma, Modena, Reggio Emilia, Lucca and Massa-Carrara
- The University of Modena and Reggio Emilia
- The University of Parma
- The University of Pisa
- The Politecnico di Milano (The Polytechnic University of Milan)
- Local schools
- 4 LAGs (Antico Frignano and Appennino Reggiano, Ducato, Montagna Appennino, Consorzio Lunigiana)
- Environmental and cultural associations
- Local consortia (including the land reclamation consortium, the chestnut growers' consortium and the forest consortium)
- Economic and business trade associations

13.4. WHAT CONSULTATION PROCEDURE WAS USED FOR DESIGNING THE BIOSPHERE RESERVE?

Local involvement in the designation of the Biosphere Reserve was obtained via a truly inclusive process that relied on the use of numerous instruments such as meetings, workshops, online forums and round tables in order to ensure that local stakeholders were consulted and able to contribute to the project. To learn more about the actions carried out before designation as a Biosphere Reserve, please refer to the nomination dossier (attached).

Various and important events have been focusing on and brought to life the strong ideas of the Biosphere Reserve of the Tuscan-Emilian Apennines, further expanding the extent of involvement, participation and relationships between stakeholders. Find below the list of the recent steps of the process, whose basic philosophy shall have to be be extended to the territories affected by the enlargement:

- the successful "Zero-Mile Menu" contests, which have now resulted in "UPVIVIUM – Zero-mile Gastronomic Biosphere", with 65 restaurants and 80 local producers involved and a wide visibility of the initiative on the press, social media, local TV with great satisfaction of the companies involved. The 2017/2018 edition was extended to the "twin" Biosphere Reserves of the Ledrensi and Judicaria Alps (Trentino) and the Po Delta (Veneto / Emilia-Romagna), while that of 2018/2019 was further extended to include 5 Italian Biosphere Reserves, with the addition of the Sila Biosphere Reserve and the Tuscan Islands Biosphere Reserve. Communication,

- *Figura 13.1*

animation and promotion include joint actions (dedicated website also for online voting) and other single actions (semi-finals in collaboration with local hotel management schools);

- The CAI Nazionale and CAI Parma (National and Parma Italian Alpine Club) held a conference on "MaB UNESCO and the Mountains" (Parma, May 2016);
- Olea Lunae hosted a research meeting on the Biosphere Reserve of the Tuscan-Emilian Apennines (Licciana Nardi, April 2016);
- "MaB UNESCO Apennines year one": meeting with the public and meeting with the students of high schools led by Philippe Pypaert of UNESCO EUROPE; Castelnovo ne 'Monti (RE), May 2016;
- the important exhibition Sapori di Fivizzano (Flavours from Fivizzano), hosted a complete review of the 72 PDO, PGI and traditional regional food and wine products (P.A.T.) recognized in the Biosphere Reserve with a focus on quality products and the territory with the participation of the University of Pollenza, Eataly / Fico and the Ambiente Vivo Association (Fivizzano, June 2016);
- 2 meetings with the Terre dell'Ebro Biosphere Reserve (Catalonia - Spain), on the theme of UNESCO branding linked to typical products with a good public turnout, composed mainly of local producers and players (Terrarossa and Carpineti, August 2016);
- Rural Festival, an event dedicated to the importance of the short chain, indigenous productions and sustainability with a focus on companies and activities of the Tuscan-Emilian Apennine Biosphere Reserve (Lesignano de 'Bagni and Gaiole in Chianti, September 2016). In August 2016, the Pomodoro Riccio Festival in Traversetolo took place and a MaB Unesco information stand was set up. In 2017, the UNESCO MaB logo was granted to the event which was attended in September 2018 both in Lesignano de 'Bagni and in Gaiole in Chianti. In addition, on the occasion of the "Eroica Britania" fair in Buxton (Manchester - Great Britain), the Rural Festival event was present with the MaB UNESCO logo;
- participation of the Biosphere Reserve of the Tuscan-Emilian Apennines at the 7th World Tourism Exhibition UNESCO HERITAGE CITIES AND SITES (Padua, September 2016);
- Italian Alpine Club (CAI) evenings, with presentations of the Tuscan-Emilian Apennine Biosphere Reserve, activities and ongoing projects (Reggio Emilia, September 2016);
- evening dedicated to getting to know the Tuscan-Emilian Apennine Reserve as part of an exhibition linked to the themes of evolution (Castello di Sarzano, Casina October 2016);
- Conference "Analysis and proposals for the UNESCO MaB Reserve in the Reggio Apennines" organized by the UNESCO Club of Reggio Emilia (Carpineti, October 2016);
- Seminar "Tourism in the Biosphere Reserve": over fifty tour operators from Lunigiana, Garfagnana and Emilia shared their views about tourism and in particular about the effects that international recognition can have on the territory (Sassalbo, November 2016);
- Dialogues and testimonies on Food, Environment, Agriculture for the inauguration of the exhibition "Behind food sustainability" (Castelnovo ne 'Monti, February 2016);

- Public Talk about Taking care of the Apennine Territory organized by the Central Emilia Reclamation Consortium (Reggio Emilia, February 2017);
- Meeting on agriculture, food and the environment (Canossa, April 2017 on the occasion of the inauguration of the UNESCO MaB exhibition);
- Participation with a delegation at the EuroMab in Dordogne (France) in March 2017;
- Speech at the conference "Tourism in UNESCO MaB Reserves: experiences and opportunities compared" at the Delta del Po Biosphere Reserve on April 27, 2017;
- 2-4 June 2017: participation in the "GolaGola Festival" food and wine fair in Parma with presentation of the UNESCO MaB products assortment, the local producers and the values of the Reserve through food and wine;
- The UNESCO Club Promoting Committee of Carpineti is born: debut on Saturday 17 June 2017 with the presentation of the book "The Apennines for Man". Other activities took place during the summer, in particular the animation for the San Vitale Fair in Carpineti;
- June 2017 in Pania di Corfino (LU) meeting entitled: "The Apuan-Apennine endemic flora" by the "Maria Ansaldi" Botanical Garden;
- Participation in the "MaB Youth Forum" at the Po Delta Reserve (18 to 23 September 2017) with a group of representatives aged 18 to 35. In preparation for the event, a first information meeting was organized at the Sarzano Castle (June 2017) followed by a second one held in September at the Union of municipalities in Castelnovo ne 'Monti, before the start of the Forum, for the definition of how to participate in the World Forum;
- July 2017: visit of a delegation of Coldiretti (organization representing agricultural entrepreneurs), active in the territory of the Po Delta Reserve, to the Tuscan territory in the frame of exchanges between Biosphere Reserves: visits to local companies and discussion on topics such as agriculture, tourism, World Youth Forum. With a view to large areas and relations between UNESCO sites, one-day visit to the 5 Terre National Park, (a UNESCO World Heritage Site);
- July 2017: meeting with the Reggio Emilia UNESCO Club for an update on the activities of the Reserve;
- July 2017: participation in the UNESCO "Summer School" held in Sardinia and dedicated to management and tourism in the UNESCO MaB Biosphere Reserves;
- summer 2017 "Comiks" project - educational stay in South Korea at the Korean National Arboretum in Seoul: meeting with the representatives of the Gwangneung Forest World Biosphere Reserve;
- summer 2017 Land (e) scape project: supra-municipal project presented by a local association with a series of promotional events relating to art and the territory;
- Apennine Geosphere: supra-municipal project presented by the Mountain Union of Municipalities of the Reggio Apennines, for the discovery and knowledge of the Reserve's geosites;
- October 2017: Castelnuovo Garfagnana meeting dedicated to the businesses of the Biosphere Reserve;

- October 2017 in Corneto di Toano (RE) opportunities and projects for businesses in the Biosphere Reserve;
- October 2017, international workshop in San Romano in Garfagnana entitled: "The social role of businesses for the development of the UNESCO MaB Biosphere Reserves";
- November 2017 Palanzano (PR), Conference "Businesses and Tuscan-Emilian Apennine MaB Reserve"
- November 2017, Amandola (FM) Seminar "Central Italy calls UNESCO", public meeting for the presentation of the Nomination for the Biosphere Reserve Designation of the territories hit by the 2016 earthquake and of the internal areas of the Sibillini Mountains. Intervention / testimony of the Tuscan-Emilian Apennine MaB Reserve;
- during the year 2018, 3 meetings were held in the Modena area (two aimed at local authority officers) and one (held in Sestola) aimed at the general public and stakeholders

THE MAP OF COLLABORATIONS

An extraordinary strength of the Tuscan-Emilian Apennine Biosphere Reserve is the aptitude for establishing relationships, collaborations and partnerships. This is partly inherent in the very essence of the MaB program, however it is important to underline that in this case the Biosphere Reserve has been able to enhance the experience and modus operandi of its coordinating body (the National Park of the Tuscan-Emilian Apennines) which over the years has managed to create a dense network of collaborations made up of over fifteen hundred entities in all areas.

Thanks to its aptitude for collaboration the Biosphere Reserve could dedicate several moments to share views and get suggestions and proposals useful for its action, but it could also play on the territory as a catalyst for projects and ideas, as a leverage for the growth of social cohesion.

The Tuscan-Emilian Apennine Biosphere Reserve has been able to activate on its territory (with Regions, Parks, Provinces, Local Bodies, Universities and Research Bodies, Schools and Training Bodies, businesses and their associations, environmental, cultural and sports associations, citizens' committees, individuals) countless collaborations that are clearly highlighted by the wealth of the Action Plan project bank in which these relationships are translated into specific projects.

By broadening the horizon, the Tuscan-Emilian Apennine Biosphere Reserve has also been able to make the most of its participation in a network of international excellence, by initiating various partnerships and by living this experience with a proactive approach and always offering its own contribution.

On a national level, the Tuscan-Emilian Apennine Biosphere Reserve actively participates in the activities stimulated by the National MaB Committee, developing projects and exchanges with other Italian Biosphere Reserves, such as through the UPVIVIUM project (www.upvivium.it) which involves five different MaB Reserves. Thanks to its proactivity, the Tuscan-Emilian Apennine Biosphere Reserve was identified by the National MaB Committee as the coordinator of a presentation event of the Italian MaB network at the UNESCO headquarters in Paris which was held on 19 June 2019.

On an international level, the Biosphere Reserve participated with its own delegations both in the world congress of the MaB program in Lima in 2016, and in the meetings of the EuroMAB regional network in 2017 (Biosphere Reserve of Dordogne - France) and in 2019 (Biosphere Reserve of Dublin Bay - Ireland). This has made it possible to better understand the opportunities offered by the MaB network and to initiate relationships and collaborations that have resulted in concrete projects such as exchange programmes and relationship activities with the Swedish network of Biosphere Reserves that are leading to the development of a project on "forestry management and climate change ", the training-exchange programmes with the Adirondack Biosphere Reserve (New York), the activities related to social enterprises within the OASIS working group coordinated by the Scottish Biosphere Reserve" Galloway and Southern Ayrshire ", The" MEL "project dedicated to beekeeping in the Mediterranean Biosphere Reserve that puts it in relation with the Spanish, French, Tunisian and Lebanese Biosphere Reserves.

Moreover, young people from the Tuscan-Emilian Apennine Biosphere Reserve have participated in the last 3 editions of the "MaB SUMMER SCHOOL" organized by the UNESCO Europe office in Venice.

HOW WILL STAKEHOLDER INVOLVEMENT IN IMPLEMENTING AND MANAGING THE BIOSPHERE RESERVE BE FOSTERED?

The contribution of stakeholders to the management of the Reserve will be guaranteed by the proposed governance model and specifically by the "Permanent Consultative Assembly", whose functions and operating modes are described in paragraph 17.1.7.

In addition to this key forum for participation, local communities and, more generally, all of the stakeholders involved in the successful operation of the Reserve will be able to consult the website http://www.parcoappennino.it/uomo.biosfera, designed to facilitate stakeholder participation and contribution, as it in fact occurred during the first application submission. This site has been maintained and expanded with the use of social media, in order provide all local and non-local stakeholders with information about the steps taken to protect, develop and support the Biosphere Reserve, as well as enabling them to express opinions, make contributions and highlight criticalities. To date, the web space that has become the official reference is http://www.mabappennino.it.

WHAT ARE THE EXPECTED MAIN SOURCES OF RESOURCES (FINANCIAL, MATERIAL AND HUMAN) TO IMPLEMENT THE OBJECTIVES OF THE BIOSPHERE RESERVE AND PROJECTS WITHIN IT?

The Appennino Tosco-Emiliano National Park will guarantee the resources required for the day-to-day operation of the Reserve's governance and communication systems. For each action taken, the task of implementing the Management Programme will be delegated to the ordinary resources of the Bodies responsible for implementation. This is an essential condition for the inclusion of these actions in the Programme (for further details, see paragraph 17.4). In support of the National Park, an absolute key role will be played by the two Regions that are mainly concerned, and that are increasingly stimulated to put the Biosphere

Reserve at the center of their programming, as well as by the Biodiversity and Parks Management Bodies of Western and Central Emilia.

The human and financial resources of the public and private entities operating in the area are both qualitatively and quantitatively sufficient to support an adequate implementation of the objectives of the Reserve. In a logic of enlargement, it can be emphasized that the added value given by the inclusion of the proposed territories is highly prominent, since it encompasses major environmental, social and economic sectors. To optimize human resources, it is necessary to be able to undertake awareness raising and active involvement actions so that both the communities already included upon the first application process and those that are about to enter it can fully endorse the mission of the Reserve by implementing - even in aggregations or groups focusing on distinct topics or territories - the projects of the Management Program according to their respective possibilities.

Further significant financial resources will be sought actively via the main funding channels, notably the 2014-2020 Rural Development Programmes run by the Regions of Tuscany and Emilia-Romagna and the EU's LIFE 2014-2020 scheme (http://ec.europa.eu/environment/life/funding/lifeplus.htm), as well as project financing opportunities in the private sector.

The social capital that is already present in the area has the potential to represent the majority of the human and material resources required, although these will need to be properly implemented in the future, by improving the good performance that characterized the first years of activity of the Reserve after designation in 2015 and transferring the best practices to the new territories included in this proposal after retaining their peculiarities and characteristics. In the perspective of enlargement, human capital is certainly destined to be enriched thanks to the new presence of socially very active and economically well-structured communities being able to integrate and stimulate the reality of the previous Reserve.

14. CONSERVATION FUNCTION

14.1. AT THE LEVEL OF LANDSCAPES AND ECOSYSTEMS (INCLUDING SOILS, WATER AND CLIMATE):

The commitment to conserving the landscapes, habitats and ecosystems is supported and demonstrated by the presence of 50 habitats of community interest, 14 of which have priority status pursuant to the Eu directive "Habitat".

The Biosphere Reserve and the territory included in the proposal of enlargement are distributed almost evenly throughout the protected areas (see chapter 14.1.3). There are Protected Areas of different entity and order, some coinciding with the National Park, others with Regional Parks and Reserves. Inside and outside such areas there are numerous Sites of Community Interest (SCI) and Special Protection Areas (SPAs) as well as some Reserves (Biogenetic or Natural Oriented). All these sites and parks have an identified and dedicated Managing Body and more than half of these are adequately equipped with a management plan. There is also within the perimeter of the Reserve the "Protected Natural and Semi-Natural Landscape of the Reggiana Hill - Terre di Matilde" which is a link with operational functionality in a logic of development of the program for the regional system of protected areas and Natura 2000 sites of the Region Emilia Romagna. This tool completes a complex set of safeguards in a wide Apennine hilly area as a link between 4 Natura 2000 sites and 1 Regional Nature Reserve.

The requirement for conservation within the area of the Appennino Tosco-Emiliano National Park is established by protection regulations annexed to the founding decree of the Park (Protection Regulations for the Appennino Tosco-Emiliano National Park) and the Park Plan. In the framework established by the General Law for Protected Areas (Law 394/91), the Park Plan is given a central role in the control functions that the Park must perform when carrying out its legally designated duties of protecting the environmental resources and promoting and organising their use. Also included in the perimeter of the Reserve are Regional and Provincial Parks which are: the Parco dei Cento Laghi, Parco Fluviale del Taro, Parco dei Boschi di Carrega (Parchi del Ducato); il Parco dei Sassi di Roccamalatina, the Parco del Frignano (Parks of Central Emilia) and the Parco Provinciale del Monte Fuso. It is interesting to note how the Regional Parks of Emilia Romagna present in the territory of the Biosphere Reserve are managed by two Bodies (Management Body for Parks and Biodiversity in Central Emilia; Management Body for Parks and Biodiversity in West Emilia) established to join pre-existing realities into a network. The Management Bodies express their conservation function within the Park Territorial Plan (Parks of Central Emilia: PTP of the Parco dei Sassi di Roccamalatina and PTP of the Parco del Frignano; Parchi del Ducato: PTP of the parco dei Boschi di Carrega, PTP Parco Fluviale del Taro and PTP of the Parco dei Cento Laghi) and numerous specific regulations on the subject, for example, hunting, construction, blueberry picking, mushroom picking.

The Parchi del Ducato include:

- the Parco Fluviale Regionale del Taro
- the Parco Regionale dei Boschi di Carrega
- the Parco Regionale dei Cento Laghi
- the Riserva Naturale Regionale di Monte Prinzera

The Parks of Central Emilia include:

- Parco Regionale del Frignano (former Parco Regionale Alto Appennino Modenese)

- Parco Regionale dei Sassi di Rocca Malatina
- Riserva Naturale Regionale Rupe di Campotrera
- Riserva Naturale orientata di Sassoguidano
- Paesaggio protetto Collina Reggiana – Terre di Matilde

This new system of "governance" of the Protected Natural Areas of the Emilia-Romagna Region was established with the approval of the Regional Law n.24 of 23.12.2011 "Reorganization of the Regional System of Protected Areas and of the sites of the Natura 2000 network and Institution of the Stirone and Piacenziano Regional Park "02/01/2012 which came into effect from 1 January 2012.

In the territories included in the Reserve proposal, but outside the perimeter of the Appennino Tosco-Emiliano National Park, conservation and adequate management is locally guaranteed by the presence of Regional Natural Parks (Parchi del Ducato and of Central Emilia) and widely guaranteed by numerous Special Conservation Areas (SCIs Sites of Community Interest) and Special Protection Areas (SPAs).

Reference was made to the following national and regional regulations in order to ensure that the contents of the Park Plans were consistent with the objectives of the Natura 2000 Network:

- Presidential Decree 357/1997, implementing Council Directive 79/409/EEC "Birds"
- Presidential Decree 120/2003, implementing Council Directive 92/43/EEC "Habitats"
- Emilia-Romagna Regional Law no. 7/04 – "Environmental provisions. Amending and integrating Regional Laws";
- Emilia-Romagna Regional Law no. 6/05 (as amended) – "Regulations for the formation and management of the regional network of Nature Reserves and sites from the Natura 2000 Network";
- Tuscany Regional Law no. 56 of 6 April 2000 – "Regulations for the conservation and protection of natural and semi-natural habitats and wild flora and fauna (...)"
- Report on the Assessment of the Environmental Impact of the Park Plan

With regard to the descriptions of SCIs and SPAs (which can be read online), reference was made to the contents of the Natura 2000 Network's Standard Data Forms in order to ensure that the status was maintained.

Additional regulatory support for the conservation of landscapes and ecosystems is provided by instruments such as:

- The Regional Territorial Plan (PTR) and Landscape Plan (PTPR) in Emilia-Romagna and the Territorial Utilisation Plan (PTI) in Tuscany
- The Park Territorial Plan (PTP), currently approved for all the Reserve Parks
- General regulations of the National Park and of every Regional Park
- General Conservation Measures (MGC) and Specific Conservation Measures (MSC) for the individual Natura 2000 Network Sites (with reference to Resolution No. 1147/2018 of the Emilia-Romagna Regional Council and Resolution No. 1123/2015 of Regional Council of Tuscany)
- The Territorial Coordination Plans (PTCs) in the provinces of Reggio Emilia, Parma, Modena, Massa Carrara, Lucca, La Spezia

- The Local and Municipal Strategic Town Planning (PRG, PSC and PS) Schemes of all of the municipalities involved.
- Regional Law R.L. Toscana n.30 / 2015 "Regulations for the conservation and enhancement of the regional naturalistic-environmental heritage. Changes to the R.L. 24/1994, to the R.L. 65/1997, to the R.L. 24/2000 and R.L. 10/2010 ", which also contains the recognition and enhancement of geosites of regional interest.
- R.L. Emilia-Romagna n.9/2006 "Rules for the conservation and enhancement of the geodiversity of Emilia-Romagna and related activities ", also relating to geosites of regional interest.
- Regional Forest Regulations (e.g. for Emilia Romagna, Resolution No. 1147/2018 of the Regional Council)
- Regional Forest Plans 2014-2020
- Regional Water Protection Plans
- Extract Plan for the Hydrogeological Asset (PSAI), District Authority of the Po River Basin
- Legislative Decree 42/2004 "Code of cultural heritage and landscape, pursuant to Article 10 of Law 6 July 2002, no. 137 "
- Management plans for Natura 2000 sites

It should be emphasized that what has been said for the Appenino Tosco-Emiliano National Park also applies to the other Protected Areas present in the Biosphere Reserve (Parco del Frignano, Parchi del Ducato, etc.). with distinctions proportional to the various statutes and regulations. Within the proposed area there are numerous landscapes and ecosystems derived from the deep and centuries-old interaction between human activity and natural environments. In this area, man has been able to use natural resources for high quality productions such as Parmigiano Reggiano cheese, Pecorino Toscano, Prosciutto di Parma, Balsamic Vinegars of Modena and Reggio (Aceto balsamico tradizionale di Modena, Aceto balsamico tradizionale di Reggio Emilia -PDO- e Aceto Balsamico di Modena -PGI-), but also viticulture, olive growing, chestnut groves for the production of chestnuts and chestnut flour, niche cereal crops such as farro di Garfagnana.

It was acknowledged that the communities themselves play an irreplaceable role in the upkeep of locations. They are responsible for the delicate balance between environmental conservation requirements and the everyday economic activities which serve as the direct means of supporting the local communities.

The numerous products with protected status due to their origins and production techniques (Protected Designation of Origin PDO; Controlled Designation of Origin CDO; Guaranteed and Controlled Designation of Origin CGDO; Typical Geographical Indication TGI; Protected Geographical Indication PGI) undergo a series of checks. Together, they ensure that the products meet specific quality requirements. In addition, a fundamental part is played by the combination of natural, environmental and human elements resulting from the profound relationships that have developed over time between agricultural systems and product processing.

Below are descriptions of flagship products that are renowned all over the world: Prosciutto di Parma (1), Prosciutto di Modena (2), Parmigiano Reggiano (3) and Aceto Balsamico di Modena (4), They are perfect examples of the combination between humans, the environment and upkeep, as set out in the strict regulations for branded product manufacturing:

1. The PDO **Prosciutto di Parma** production zone is in the Province of Parma. It stretches for no less than 5 km to the South of the Via Aemilia, up to an altitude of no more than 900 metres. The boundary is marked by the River Enza to the East and the Stirone Stream to the West. The zone has exceptional ecological, climatic and environmental conditions. It is the only area where it is possible to find the invaluable, unique wind that was historically used to dry Prosciutto di Parma, thus making it sweet and exclusive. The wind comes in from the sea on the Versilia coast, becomes calmer among the olive and pine trees in the Val Magra, dries out in the Cisa, Lagastrello and Cirone passes in the Apennines and is enriched by the fragrance of chestnut trees before blowing between the hams in the valleys near Parma. In order to make the most of the breeze, the production plants are positioned crosswise to the air flow and they have a lot of large windows so that the ventilation can make its decisive contribution to the distinctive enzymatic and biochemical transformation processes of Prosciutto di Parma. The biochemical transformations that take place during the long maturing period go through a specific process thanks to the optimum ecological conditions in the Parma valleys, which cannot be matched in any other location. In the areas at higher altitudes of the Prosciutto di Parma production zone, there are no production sites that pollute the environment with liquid and/or gas emissions. Protection Law no. 26 of 13/02/1990 ensures that this remains the case, stating that: "In order to preserve the typical conditions in the production environment that are responsible for the sensory profile and commercial properties of Prosciutto di Parma, prior approval from the regional committee for atmospheric pollution for the relevant territory must be given before category 1 unhealthy businesses – as legally defined by article 216 of the Health Law Consolidation Act, approved by Royal Decree no. 1265 of 27 July 1934 – and any other businesses that may endanger the ongoing equilibrium in the environmental conditions can move into the zone". Deep-rooted awareness of the objective need to protect and preserve the environment is required in order to justify the introduction of such strict regulations (in the above-mentioned national legislation, the term "category 1 unhealthy businesses" covers practically all manufacturing businesses and even cattle sheds. The current national legal framework is an integral part of the production regulations. Essentially, it is nothing more than a formal way of consolidating and subsequently codifying the procedures that were historically established by human and production factors in singular geographical and environmental settings, within precisely identified and defined areas that are respectively ideally suited to the production of the ingredients used in Prosciutto di Parma and the processing of Prosciutto di Parma itself (product production and processing area – laws safeguarding the production).

2. The production area of **Prosciutto di Modena** PDO corresponds to the Apennine hilly belt that develops around the orohydrographic basin of the Panaro river within the provinces of Modena, Reggio Emilia and Bologna. From the altimetric point of view, as for the Prosciutto di Parma PDO, the production up to hilly altitudes not exceeding 900m is considered typical. The origins of the product probably date back to the Bronze Age, with the first evidence dating back to the Celts (who introduced the practice of preserving meat with salt in the area) and the Romans. The Prosciutto di Modena is obtained exclusively from the fresh leg of pigs born, reared and slaughtered in the regions of Emilia-Romagna, Veneto, Lombardy, Piedmont, Molise, Umbria, Tuscany, Marche, Abruzzo, Lazio, according to the strict requirements of the Production Specifications. The designation of origin "Prosciutto di Modena" is legally protected by Law 11 of 12 January 1990: "Protection of the designation of origin of Prosciutto di Modena, delimitation of the production

area and product characteristics" and by the EC Reg. 1107 / 1996, with which Prosciutto di Modena obtained the PDO label.

3. The quality of **Parmigiano Reggiano** is based on a combination of factors associated with the production techniques, but the environment plays the biggest part. Parmigiano Reggiano from the Apennines is made in environmental conditions where human activities have a lower impact and the drier, cooler climate is more favourable than on the plain. In addition, the quality of the forage is higher due to the greater variety of plant species that grow in the permanent grassland and meadows of the mountains, while the milk produced is better because mountain cattle are less productive but their milk has a higher protein and fat content. The production specifications drawn up by the Parmigiano Reggiano Consortium contain two crucial clauses regarding dairy cows feeding that significantly influence the rural landscape. at least 50% of the fodder used must be made on the producer's land, which in turn must be located within the Parmigiano Reggiano cheese production area, and at least 75% of the fodder must be made in the Parmigiano Reggiano cheese production area. Some dairies with the farms that supply the milk have obtained the premium quality brand of mountain Parmigiano Reggiano. The differentiated landscape generated in relation to the production of this important PDO it is characterized by a highly articulated combination of natural connotations, agricultural processes, socio-economic dynamics, human settlements and the effects of political-administrative choices. For this reason, in order to ensure that this landscape is a perceived and recognized asset, the project "School of the Parmigiano Reggiano landscape" was launched in 2018 with the collaboration of the Cervi Institute - Archivio Emilio Sereni and the Municipalities of Carpineti, Casina and Neviano degli Arduini; the project is currently part of the Action Plan of the Biosphere Reserve.

4. **Aceto Balsamico di Modena** I.G.P. Protected Geographical Indication The tradition is traced back to Roman times even if the production of Balsamic Vinegar relates to the city of Modena starting from the 11th century, in which Henry III, Emperor of the Holy Roman Empire received it as a tribute from Bonifacio Marquis of Tuscany (father of Matilde di Canossa). It was then the Este family of Modena who developed the vinegar production at their court, but only in 1747 did the adjective "balsamic" appear in the cellar records. At a regulatory level, on March 25, 1933, the Minister of Agriculture Giacomo Acerbo recognized for the first time, with an official act, the "centuries-old and traditional industry of the Aceto Balsamico del Modenese". Thirty years later, in 1965, a specification was published in the Official Journal relating to the "Composition characteristics and methods of preparation of Aceto Balsamico di Modena". In 1994 the producers took action to improve the production specifications and to protect the correct use of the name Aceto Balsamico di Modena for trade and consumption. This product is uniquely traditional of the provinces of Modena and Reggio Emilia because it requires optimal climatic characteristics for the correct development of the native acetic flora: cold winters and hot and humid summers, mild springs and autumns. The grapes used to produce it must have the right concentration of sugars and acidity, like the vines of the Modena and Reggio area: Lambrusco, Sangiovese, Trebbiano, Albana, Ancellotta, Fortana and Montuni.

The landscapes and ecosystems included in the proposed Biosphere Reserve, due to their particular geographical location (Euro-Mediterranean climatic border) and the geological constitution (widespread presence of clayey substrates), require specific attention to the hydraulic equilibrium and a capillary and widespread land defence work.

It should be noted that the Management Body for Parks and Biodiversity in Emilia Centrale has established the "QUALITÀ Central Emilia Parks" brand, registered with the Modena Chamber of Commerce, with the aim of promoting and supporting the productions, activities and services that share the path of environmental improvement of the managed territory. Finally, the Body has filed the application for obtaining the EMAS (Eco-Management and Audit Scheme) Certification.

Human activity that puts energy into ecosystems through the creation of a widespread network of hydraulic-agricultural arrangements is an indispensable prerequisite for the maintenance of landscapes and local knowledge for soil protection is the method of action.

Within such framework and in compliance with Council Directive 98/83/EC the Reserve and the Parks (National and Regional) in this area of the Apennines:

- Aim to promote rational, sustainable use of water resources based on long-term protection of the resources available. Part of the reason for this is to prevent further deterioration, protect and improve the state of the aquatic and terrestrial ecosystems and the wetlands that are directly dependent on the aquatic ecosystems due to their water requirements, also through some practices that may reinforce renaturalization of rivers and waterstreams ;
- In terms of protecting the land and managing water, aim to achieve its goals by seeking to form partnerships with Regions, Provinces, Mountain Unions, Municipalities and the relevant River Basin Authorities in order to carry out the actions in specific water management plans;
- Strive to ensure that the territory is managed in such a way as to preserve its hydrogeological equilibrium and the safety and stability of the mountainsides;
- To this end, the Parks in conjunction with other Administrative Bodies, in order to guarantee the environmental flow (DMV or DE in Italian) of waterstreams, will define the appropriate levels, also seasonally differentiated, for the existing water abstractions in order to safeguard the water bodies of the protected areas with immediate positive effects outside the boundaries of such protected areas. Action will also be promoted to improve the management of reservoirs by resolving issues related to the transportation of solid materials and silting;
- In addition, the sites that have been made part of the Natura 2000 Network in accordance with Council Directive 92/43/EEC and Council Directive 79/409/EEC have been classified as areas where it is particularly important to maintain or improve the state of the water in order to protect them. Therefore, in order to safeguard and increase biodiversity and enhance the functionality and natural connectivity of the ecological network, measures will be promoted to improve the quality of water and maintain a satisfactory state of conservation for the wetlands and the animal and plant species present on the site.

DESCRIBE AND GIVE THE LOCATION OF ECOSYSTEMS AND/OR LAND COVER TYPES OF THE BIOSPHERE RESERVE.

The land cover in the territory varies significantly due to its singular form and its status as a boundary area between two climate zones. The most standardised database available with details of the spatial distribution of plant ecosystems and land use in the territory is the CORINE Land Cover database, which was last updated and revised in 2012.

The CORINE (COoRdination of INformation on the Environment) project was launched by the European Commission in 1985. Its main goal is to keep a dynamic check on the state of the environment in the European Union, in order to steer joint policies, monitor their effects and propose corrective measures if necessary. The Corine Land Cover (CLC) project was introduced across Europe with the specific aim of surveying and monitoring land use and cover in the territory, with a particular focus on environmental protection needs. It has produced a European mosaic based on SPOT-4 HRVIR, SPOT-5 HRG and/or IRS-P6 LISS-III satellite pictures, which have been used to create digital maps of land use/coverage and changes thereof. For the Italian territory alone, the decision was made to extend the descriptions to level 4 for forests and semi-natural areas. This gives a clearer depiction of the blend of ecosystems in the territory.

In the Reserve area, 46 types of level 4 land cover were identified altogether (see the annex about land use). They are:

CODICE CLC	Descrizione	Area (ha)		
		CORE	BUFFER	TRANS.
111	ARTIFICIAL SURFACES - Urban fabric/Continuous urban fabric	0.0	0.0	90.77
112	ARTIFICIAL SURFACES - Urban fabric/Discontinuous urban fabric	0.16	89.42	3882.14
121	ARTIFICIAL SURFACES - Industrial, commercial and transport units/ Industrial or commercial units	0.00	0.00	567.08
131	ARTIFICIAL SURFACES - Mines, dump and construction sites/Mineral extraction sites	0.00	0.00	811.56
142	ARTIFICIAL SURFACES - Artificial non-agricultural vegetated areas/ Sport and leisure facilities	0.00	0.00	41.78
2111	AGRICULTURAL AREAS - Arable land/Non-irrigated arable land/Intensive agriculture	0.00	68.14	13599.18
2112	AGRICULTURAL AREAS - Arable land/Non-irrigated arable land/Extensive agriculture	0.00	438.56	19534.13
221	AGRICULTURAL AREAS - Permanent crops/Vineyards	0.00	0.00	26.98
222	AGRICULTURAL AREAS - Permanent crops/Olive groves	0.00	0.00	197.24
223	AGRICULTURAL AREAS - Pastures/Pastures	0.00	0.00	926.33
231	AGRICULTURAL AREAS - Heterogeneous agricultural areas/Annual crops associated with permanent crops	61.18	63.62	567.42
241	AGRICULTURAL AREAS - Heterogeneous agricultural areas/Annual crops associated with permanent crops	0.00	0.00	887.23
242	AGRICULTURAL AREAS - Heterogeneous agricultural areas/Complex cultivation patterns	0.0	0.0	5979.26

243	AGRICULTURAL AREAS - Heterogeneous agricultural areas/Land principally occupied by agriculture, with significant areas of natural vegetation	36.49	2388.71	84400.33
244	AGRICULTURAL AREAS - Heterogeneous agricultural areas/Agro-forestry areas - Annual crops or grazing land under the wooded cover of forestry species	0.00	0.84	32.76
3111	FORESTS AND SEMI-NATURAL AREAS - Forests/Broad-leaved forests/Forests predominantly of oaks and other broad-leaved evergreen trees (such as holm oak and cork oak trees)	0.00	0.00	514.25
3112	FORESTS AND SEMI-NATURAL AREAS - Forests/Broad-leaved forests/Forests predominantly of deciduous oaks (such as Turkey, downy, Italian, Durmast and English oak trees)	200.32	2755.23	78096.56
3113	FORESTS AND SEMI-NATURAL AREAS - Forests/Broad-leaved forests/Mixed forests predominantly of other native broad-leaved trees (mesophilic and meso-thermophilic broad-leaved trees such as maple, ash, Hop Hornbeam and manna ash trees)	0.00	1080.91	11283.34
3114	FORESTS AND SEMI-NATURAL AREAS - Forests/Broad-leaved forests/Predominantly chestnut forests	80.52	1712.75	36358.03
3115	FORESTS AND SEMI-NATURAL AREAS - Forests/Broad-leaved forests/Predominantly beech forests	6994.20	17062.50	40468.26
3116	FORESTS AND SEMI-NATURAL AREAS - Forests/Broad-leaved forests/Forests of predominantly hygrophytic trees (such as willow, poplar and alder trees)	0.00	0.00	739.37
3117	FORESTS AND SEMI-NATURAL AREAS - Forests/Broad-leaved forests/Forests and former plantations of predominantly exotic broad-leaved trees (such as robinia and ailanthus trees)	0.00	0.00	1323.45
3121	FORESTS AND SEMI-NATURAL AREAS - Forests/Coniferous forests/Forests predominantly of Mediterranean pine and cypress trees (such as stone pine, maritime pine and Aleppo pine trees)	0.00	0.00	104.41
3122	FORESTS AND SEMI-NATURAL AREAS - Forests/Coniferous forests/Forests predominantly of Oro-Mediterranean and mountain pines (such as Corsican Pine, Scots pine and Bosnian pine trees)	0.00	132.13	1786.02
3123	FORESTS AND SEMI-NATURAL AREAS - Forests/Coniferous forests/Predominantly fir forests (such as silver fir and European spruce trees)	190.33	359.88	943.82
3125	FORESTS AND SEMI-NATURAL AREAS - Forests/Coniferous forests/Forests and former plantations of predominantly exotic conifers (such as Douglas fir, Monterey pine and Weymouth pine trees)	0.00	1.17	40.08
31311	FORESTS AND SEMI-NATURAL AREAS - Forests/Mixed forests/Mixed broad-leaved and coniferous forests (predominantly broad-leaved)/Coniferous and broad-leaved mixed forests predominantly holm oak and cork oak trees	0.00	0.00	79.34

31312	FORESTS AND SEMI-NATURAL AREAS - Forests/Mixed forests/Mixed broad-leaved and coniferous forests (predominantly broad-leaved)/Forests of predominantly deciduous oaks (such as Turkey, downy, Italian, Durmast and English oaks	0.00	53.36	1268.38
31313	FORESTS AND SEMI-NATURAL AREAS - Forests/Mixed forests/Mixed broad-leaved and coniferous forests (predominantly broad-leaved)/Mixed forests predominantly of other native broad-leaved trees (mesophilic and meso-thermophilic broad-leaved trees such as maple, ash, Hop Hornbeam and manna ash trees)	0.00	0.00	72.89
31314	FORESTS AND SEMI-NATURAL AREAS - Forests/Mixed forests/Mixed broad-leaved and coniferous forests (predominantly broad-leaved)/Predominantly chestnut forests	0.00	0.47	1057.66
31315	FORESTS AND SEMI-NATURAL AREAS - Forests/Mixed forests/Mixed broad-leaved and coniferous forests (predominantly broad-leaved)/Predominantly beech forests	116.11	813.42	3600.49
31317	FORESTS AND SEMI-NATURAL AREAS - Forests/Mixed forests/Mixed broad-leaved and coniferous forests (predominantly broad-leaved)/Forests and former plantations of predominantly exotic broad-leaved trees (such as robinia and ailanthus trees)	0.00	0.00	144.02
31321	FORESTS AND SEMI-NATURAL AREAS - Forests/Mixed forests/Mixed coniferous and broad-leaved forests (predominantly coniferous)/Forests predominantly of Mediterranean pine and cypress trees (such as stone pine, maritime pine and Aleppo pine trees)	0.00	0.00	1018.73
31322	FORESTS AND SEMI-NATURAL AREAS - Forests/Mixed forests/Mixed coniferous and broad-leaved forests (predominantly coniferous)/Forests predominantly of Oro-Mediterranean and mountain pines (such as Corsican Pine, Scots pine and Bosnian pine trees)	140.03	197.02	2443.21
31323	FORESTS AND SEMI-NATURAL AREAS - Forests/Mixed forests/Mixed coniferous and broad-leaved forests (predominantly coniferous)/Predominantly fir forests (such as silver fir and European spruce trees)	21.95	261.80	423.03
31325	FORESTS AND SEMI-NATURAL AREAS - Forests/Mixed forests/Mixed coniferous and broad-leaved forests (predominantly coniferous)/Forests and former plantations of predominantly exotic conifers (such as Douglas fir, Monterey pine and Weymouth pine trees)	0.00	50.87	375.01
3211	FORESTS AND SEMI-NATURAL AREAS - Shrub and/or herbaceous vegetation association/High altitude natural grassland/Continuous grassland	3200.02	2737.64	3624.64
3212	FORESTS AND SEMI-NATURAL AREAS - Shrub and/or herbaceous vegetation association/High altitude natural grassland/Discontinuous grassland	398.99	219.08	1032.02
324	FORESTS AND SEMI-NATURAL AREAS - Shrub and/or herbaceous vegetation association/Transitional woodland shrub	364.54	701.67	11325.67

3241	FORESTS AND SEMI-NATURAL AREAS - Shrub and/or herbaceous vegetation association/Transitional woodland shrub/Natural recolonization area	0.00	0.00	35.41
331	FORESTS AND SEMI-NATURAL AREAS - Open spaces with little or no vegetation/Beaches, dunes, sand plains and exposed gravel river bars	0.00	296.97	2397.01
332	FORESTS AND SEMI-NATURAL AREAS - Open spaces with little or no vegetation/Bare rocks, cliffs and outcrops	0.00	37.78	104.14
333	FORESTS AND SEMI-NATURAL AREAS - Open spaces with little or no vegetation/Sparsely vegetated areas	329.60	233.80	1338.34
334	FORESTS AND SEMI-NATURAL AREAS - Open spaces with little or no vegetation/Areas affected by fires	0.00	0.00	8.63
511	WATER BODIES - Inland waters/Waterstreams, canals and waterways	0.00	0.00	70.84
512	WATER BODIES - Inland waters/Water bodies	0.0	34.05	38.45

The most commonly found type of land cover in all of the areas is 311 (FORESTS AND SEMI-NATURAL AREAS - Forests/Broad-leaved forests), and more specifically "Predominantly beech forests" (code 3115), which can be found almost everywhere along the main ridge and the secondary ridges; Similarly, all along the ridge there are areas of "Shrub and/or herbaceous vegetation association/High altitude natural grassland/ Continuous grassland" (code 3211). Moving away from the ridge and in general from the Core Areas, there are "Forests predominantly of deciduous oaks (such as Turkey, downy, Italian, Durmast and English oak trees)" (code 3112), whose growth is restricted by the altitude, and then "Heterogeneous agricultural areas/ Land principally occupied by agriculture, with significant areas of natural vegetation" (code 243), which are in general the more widespread in the Biosphere reserve territory.

The local differences in the distribution of the ecosystems due to climate, the underlying geology and the traditions in the territory become apparent when certain specific types of land cover are examined: analysis reveals that some land uses can only be found on the Tuscan side: olive groves (code 223), forests predominantly of oaks and other broad-leaved evergreen trees (such as holm oak and cork oak trees, code 3111), forests of predominantly hygrophytic trees (such as willow, poplar and alder trees, code 3116) and forests predominantly of Mediterranean pine and cypress trees (such as stone pine, maritime pine and Aleppo pine trees, code 3121). These types of land cover are all indicators of a milder climate influenced by the Tyrrhenian Sea (Mediterranean climate).

Predominantly chestnut forests (code 3114) appear mostly but not exclusively on the Tuscan side, while the distinctive features of the Emilian side are extensive agriculture (code 2112, largely due to the different gradients of the slope) and mixed broad-leaved and coniferous forests made up predominantly of beech trees (code 31315) or silver fir and European spruce trees (code 31323).

The river morphology varies due to the lithology and the gradients of the slopes, so large exposed gravel stream and river bars can only be found on the Emilian side (code 331); on the Tuscany side such deposits can be found exclusively along the Magra river.

The land cover map in the annex reveals that there are no signs of human activity in the Core Areas except for a few dozen hectares that are classified as "Heterogeneous agricultural areas/Land principally occupied by agriculture, with significant areas of natural vegetation" (code 243). The predominant land cover in Core Areas consists of shrub and herbaceous vegetation association and broad-leaved forests (with a very significant presence of high altitude natural grassland). Further down the ridge, in the Buffer Zones the agriculture mentioned above (cod. 243), and covers approximately a tenth of the territory, with a first appearance being made by arable land (code 211) and pastures (code 231). However, mixed coniferous and broad-leaved forests still cover more than 60% of the territory and the urban fabric is discontinuous even where it is present. In the Transition Areas, there is greater agricultural land use, taking up a third of the territory (approx. 37,5%) However, as shown by the map in the annex to the dossier below, the landscape clearly forms a mosaic of ecosystems, with arborescent shapes and small average dimensions.

DESCRIBE THE STATE AND TRENDS OF THE ECOSYSTEMS AND/OR LAND COVER TYPES DESCRIBED ABOVE AND THE NATURAL AND HUMAN DRIVERS OF THE TRENDS.

The habitats and land cover types found in the area corresponding to the enlarged version of the Biosphere Reserve are listed and described in chapters 14.1 and 14.1.1 and in the annexed tables. The survey was carried out reasonably recently (CORINE 2012), so the information can be considered up to date.

The lack of specific studies means that changes to habitats and land cover can only be monitored on a macroscopic scale. It is possible to partially compensate for this by noting the "threats" to habitats and species that are identified in management plans and conservation measures for Natura 2000 Areas. In addition, aerial and satellite pictures can be used to keep check on changes to land cover. Furthermore, the National Park is using special funds provided by the Italian Ministry of the Environment ("Chapter 1551" funds) to carry out a number of schemes to monitor changes in habitats and species.

The general trends that have a huge impact on the area can be summed up as follows:

- The amount of woodland is increasing and taking the place of pastures, agricultural land, high altitude natural grassland and exposed gravelly stream and river beds. As in the rest of Italy and Europe, zones classified as forests are continuously growing throughout the area. This expansion process started approximately 60 years ago and it is continuing at a rapid pace. The forests in the highest part of the ridge cover more than 80% of the territory and they have expanded into land that was previously used for crops and grazing. The main reasons for this lie in socio-economic development and the mass use of fossil fuels, as well as the woodland protection rules that came into force at the start of the last century. At a rough estimate, in the last 60 years the land covered by forests has more or less doubled in the proposed Reserve. In addition, the forest structures have aged overall and become complex entities. The

areas of woodland are often part of estates that have been broken up, so many of them are insufficiently managed and left to develop naturally. It is important to note that the tree line is getting higher: in this stretch of the Apennines it is at approximately 1,600 metres. The expansion of the woodland is much slower in this case, but it is still clearly moving upwards. The causes lie in the gradual reduction in pasture land and the associated practice of burning pastures, as well as the increasing temperature at altitude, which enables grassland to be colonised by woody plants. The numerous measures in the Rural Development Plan have had an impact on the trend due to both forest management activities and conservation initiatives for pastures. The expansion of forests into open areas leads to a loss of biodiversity and natural dynamics which must be managed because in some cases they can restrict or reduce the quality of the landscape if they are left to themselves. In order to gain a better understanding of these processes, in 2008 the National Park started a "Landscape Project" in association with Diproval: the Department of Food and Agriculture Protection and Promotion from the Faculty of Economics at the University of Bologna). It began a "Study into the changes in the agricultural and forest landscape in the Appennino Tosco-Emiliano National Park". Specific sample areas were used to represent different situations in the analytical study, which was carried out in preparation for the selection of concrete, active territorial management strategies. The study revealed that the loss of the original functions of rural areas and the natural colonisation and growth dynamics of forests in areas that are no longer managed by humans cause structural variations to elements of the landscape on a limited time scale. In many cases, active management is needed in order to preserve the perception of the asset and the biodiversity of the areas. Once the National Park was aware of these issues, it was able to engage in open debates about sensitive topics for all citizens. Drawing on the above-mentioned project, priorities were established and specific active management strategies were launched for the upkeep and restoration of open spaces, using National Park funds and the Regional Rural Development Plan (PRSR). The schemes focused on areas with significant or outstanding landscapes where changes to the elements in the landscapes – and in particular the proportion of space occupied by grassland, arable land and forests – are altering the perception of the asset itself among the more aware and interested citizens. A lively debate has begun about "what to do/how to do it" and efforts are being made to inform and involve (through initiatives such as a seminar entitled "Forests and the Landscape: relationships, dynamics, values and choices", university theses and various public meetings) local people, associations and authorities in an attempt to set shared landscape quality objectives and carry out pilot schemes in sample areas such as the Pietra di Bismantova.

- A reduction in trees and shrubs in individual and linear formations (hedges): agricultural mechanisation in mountain and hill zones has brought about profound organisational changes. Animals and their sheds now tend to be concentrated in small areas. This has led to the removal of linear arrangements of individual trees and hedges inside pastures and meadows, thus simplifying the forage/forest mosaic, reducing the ecotones between one ecosystem and the next, and reducing biodiversity. The Rural Development Plan has made reasonably successful attempts to counter the eradication of trees in individual and linear formations.

- A decrease in chestnut groves for harvesting: the chestnut groves that were once widespread throughout the proposed area of the MaB Reserve (especially near towns and villages) are gradually

turning into mixed forests with fewer and fewer chestnut trees. This is partly due to emigration from the higher areas of the Apennines and the fact that chestnut groves for harvesting no longer benefit from the agricultural care required for their upkeep. Although there are a few exceptions, the majority of the chestnut groves in the reserve have gradually been abandoned and they are turning into other types of forest. The Rural Development Plan and other financial instruments have been widely used to counter this trend, not always successfully. However, in the last 5 years there have been marginal signs of interest in chestnut growing, so it is possible that there will be a decrease in the rate of reduction in the area covered by chestnut groves for harvesting.

- An increase in the urban fabric in the lower altitude areas of the Reserve: in the municipalities at lower altitudes in the Reserve, urban areas of residential and industrial complexes are expanding into land that was previously used for agriculture. The newly urbanised areas only account for a small proportion of the surface area of the proposed Reserve, but the municipalities have still introduced land conservation measures in their most recent plans.

WHAT KIND OF PROTECTION REGIMES (INCLUDING CUSTOMARY AND TRADITIONAL) EXIST FOR THE CORE AREA(S) AND THE BUFFER ZONE(S)?

Throughout the area, there is a strong identity-based bond between the community and the territory, especially in the areas with rights of common, where the residents have the right to use goods from rural areas for their own sustenance. They usually have the right to graze animals and gather items such as firewood and mushrooms. Over the centuries, these collective rights to joint property have reinforced the resident communities' ties with the territory.

The territory in the Core Areas and Buffer Zones is part of the Appennino Tosco-Emiliano National park, of the Macroarea of Central Emilia Parks and of the Macroarea of Western Emilia Parks. With reference to the whole extension of the current Biosphere Reserve and to the proposal of enlargement, including also the Transition Area, the following Protected Areas are (totally or partially) included:

All of the territory in the Core Areas and part of the land in the Buffer Zones is inside the Appennino Tosco-Emiliano National Park and the Regional Parks/Reserves. The Appennino Tosco-Emiliano National Park, which was established on 21 May 2001 by a Decree from the President of the Italian Republic as a "Non-economic Public". Its actions are regulated by the General Law for Protected Areas: Law 394 of 1991 and it operates under the supervision of the Italian Ministry of the Environment. With reference to other protected areas (Regional Parks and Regional and Provincial Reserves):

- the Appennino Tosco-Emiliano National Park
- the Parco Fluviale Regionale del Taro
- the Parco Regionale dei Boschi di Carrega
- the Parco Regionale dei Cento Laghi
- the Riserva Naturale Regionale di Monte Prinzera
- the Parco Regionale del Frignano
- the Parco Regionale dei Sassi di Rocca Malatina
- the Riserva Naturale Regionale Rupe di Campotrera
- the Parco Provinciale Monte Fuso (Oasi faunistica)
- the Paesaggio Naturale e Seminaturale Protetto Collina Reggiana-Terre di Matilde
- the Riserva Naturale Rupe di Campotrera

- the Riserva Naturale orientata di Sassoguidano

As far as the National Park is concerned, it was established with reference to the Presidential decree of 21 May 2001 "Establishment of the Appennino Tosco-Emiliano National Park". With reference to the Protected Areas of Emilia-Romagna, their establishment refers to Regional Law n. 6/2005 "Regulation on the establishment and management of the regional system of Protected Areas and Natura 2000 Network Sites", with current management reorganisation referring to the Regional Law n.24/2011 "Reorganisation of the Regional System of Protected Areas and Natura 2000 Network Sites", becoming effective on 1 January 2012.

Reference is made to the Regional Law n.24 of 23.12.2011 "Reorganisation of the Regional System of Protected Areas and Natura 2000 Network Sites" of the Emilia-Romagna region becoming effective on 1 January 2012.

The list of 40 among the Sites of Community Interest (SCIs), Special protection Areas (SPAs) and Special Areas of Conservation (SACs), being part of the Natura 2000 Network and present in the Biosphere Reserve territory as well as in the territory falling within the proposal of enlargement is shown below. The enlargement would allow the Reserve to have 16 more community sites.

Site	Natura 2000 Sites code 2000
Boschi di Carrega (*)	SCI - IT4020001
Monte Prinzera (*)	SCI - IT4020006
Groppo di Gorro (*)	SCI - IT4020011
Belforte, Corchia, Alta Val Manubiola (*)	SCI - IT4020013
Monte Capuccio, Monte Sant'Antonio (*)	SCI – IT4020014
Crinale dell'Appennino parmense (*)	SCI -SPA - IT4020020
Medio Taro (*)	SCI -SPA – IT4020021
Barboj di Rivalta (*)	SIC – IT4020023
Monte Acuto, Alpe di Succiso (*)	SCI -SPA - IT4030001
Monte Ventasso (*)	SCI -SPA - IT4030002
Monte la Nuda, Cima Belfiore, Passo del Cerreto (*)	SCI -SPA - IT4030003
Val d'Ozola, Monte Cusna (*)	SCI -SPA - IT4030004
Abetina Reale, Alta Val Dolo (*)	SCI -SPA - IT4030005
Monte Prado (*)	SCI -SPA - IT4030006
Pietra di Bismantova (*)	SCI - IT4030008
Gessi Triassici (*)	SCI - IT4030009
Monte Duro (*)	SCI - IT4030010
Fiume Enza da La Mora a Compiano (*)	SCI - IT4030013

Rupe di Campotrera, Rossena (*) -	SCI - IT4030014
Ca' del Vento, Ca' del Lupo, Gessi di Borzano (*)	SCI - IT4030017
Media Val Tresinaro, Val Dorgola (*)	SCI - IT4030018
Rio Tassaro (*)	SCI - IT4030022
Monte Cimone, Libro Aperto, Lago di Patrignano (*)	SCI -SPA IT4040001
Monte Rondinaio, Monte Giovo (*)	SCI -SPA IT4040002
Sassoguidano, Gaiato (*)	SCI -SPA - IT4040004
Alpesigola, Sasso Tignoso e Monte Cantiere (*)	SIC-ZPS - IT4040005
Poggio Bianco Dragone (*)	SCI -SPA - IT4040006
Valle del Torrente Gordana (*)	SAC (ex- SCI) - IT5110001
Monte Orsaro (*)	SAC (ex- SCI) - IT5110002
Monte Matto - Monte Malpasso (*)	SAC (ex- SCI) - IT5110003
Monte Acuto - Groppi di Camporaghena (*)	SAC (ex- SCI) - IT5110004
Monte La Nuda - Monte Tondo (*)	SAC (ex- SCI) - IT5110005
Monte Sagro (*)	SAC (ex- SCI) - IT5110006
Monte Borla - Rocca di Tenerano (*)	SAC (ex- SCI) - IT5110008
Monte Sillano - Passo Romecchio (*)	SAC (ex- SCI) - IT5120001
Monte Castellino - Le Forbici (*)	SAC (ex- SCI) - IT5120002
Parco dell'Orecchiella - Pania di Corfino - Lamarossa (*)	SAC (ex- SCI) - IT5120003
San Valentino, Rio della Rocca ZSC (*)	SAC (ex-SCI) - IT4030016
Pania di Corfino	SPA - IT5120004

The above table shows in bold characters the areas falling within the process of Reserve enlargement. The symbol (*) accompanies the Natura 2000 Sites that are governed by a Management Plan with explicit conservation measures.

Throughout all the Italian National Parks and Protected areas, with some differences in regulations, it is usually forbidden:

- capturing, killing, harming, disturbing the animal species;
- collecting and damaging the spontaneous flora and the forest products;
- the introduction into the natural environment of foreign animal species that may alter the natural balance;
- collecting of geological and palaeontological material;
- opening and the operation of quarries, mines and landfills, as well as the removal of minerals;

- the introduction, by private individuals, of weapons, explosives, or any destructive or catching means. Prior authorisation from the Authority is required to fly over or take weapons into the territory of the protected areas;
- camping, that is only permitted in specially equipped campsites, although in zones overnight camping is permitted as long as the tent is pitched at sunset and removed at dawn;
- modifying the water system, except for works of soil defence and those necessary for the safety of the population.
- lighting of fires except in duly designated areas fit with suitable facilities.

Notably for the Appennino Tosco-Emiliano National park, fishing is forbidden in the "Zone 1" areas of the Park. Cutting down trees for wood in the forests is forbidden in "Zone 1" areas and prior authorisation from the Park Authority is required in "Zone 2" areas, while it is permitted in accordance with the rules in force in "Zone 3" areas of the Park.

It is forbidden to take weapons into or fly over the Park territory unless previously authorised by the Park Authority. Camping is prohibited out of the duly designated areas fit with suitable facilities, exclusively for "Zone 2" and "Zone 3" of the Park overnight camping is permitted as long as the tent is pitched at sunset and removed at dawn.

Transport in motor vehicles is only permitted in the Park on state, provincial and municipal roads and vicinal roads with easements. In any case, specific authorisation from the Park Authority is required to access Zone 1 areas in motor vehicles.

Moreover, Regional Parks and Reserves mentioned above are governed by strict regulations as to conservation that have been defined by and for specific contexts, e.g. for hunting, construction, mushroom harvesting etc.

Below is a list of all of the protected areas with territory that is partly covered by Core Areas. This shows their outstanding natural value and the extension of the protection dedicated to them:

M.TE SILLARA CORE AREA

- Appennino Tosco-Emiliano National Park - Zone 1
- Appennino Tosco-Emiliano National Park - Zone 2
- Appennino Tosco-Emiliano National Park - Zone 3
- Appennino Tosco-Emiliano National Park - State Nature Reserve Zone (RNS)
- Bodies for the Management of Parks and Biodiversity in West Emilia - Parma and Cedra Valleys Regional Park (Founded on 23/12/2011 by Regional Law no. 24)
- SCI-SPA zones: IT4020020 PARMA APENNINE RIDGE and 100 Lakes Park

ALPE DI SUCCISO CORE AREA

- Appennino Tosco-Emiliano National Park - Zone 1
- Appennino Tosco-Emiliano National Park - Zone 2
- SCI-SPA zones: IT4030001 MONTE ACUTO, ALPE DI SUCCISO

M.TE VENTASSO CORE AREA

- Appennino Tosco-Emiliano National Park - Zone 1
- Appennino Tosco-Emiliano National Park - Zone 2
- SCI-SPA zones: IT4030002 Monte Ventasso

PIETRA DI BISMANTOVA CORE AREA

- Appennino Tosco-Emiliano National Park - Zone 2
- SCI Zone: IT4030008 Pietra di Bismantova

CIMA BELFIORE CORE AREA

- Appennino Tosco-Emiliano National Park - Zone 2
- Appennino Tosco-Emiliano National Park - Zone 3
- SCI-SPA zones: IT4030003 Monte La Nuda, Cima Belfiore, Passo del Cerreto

M.TE CUSNA CORE AREA

- Appennino Tosco-Emiliano National Park - Zone 1
- Appennino Tosco-Emiliano National Park - Zone 2
- Appennino Tosco-Emiliano National Park - Zone 3
- Appennino Tosco-Emiliano National Park - State Nature Reserve Zone (RNS)
- SCI-SPA zones: IT5120004 Pania di Corfino; IT4030005 Abetina Reale, Alta Val Dolo; IT4030006 Monte Prado; IT4030004 Val d'Ozola, Monte Cusna

MONTE GIOVO CORE AREA

- Parco Regionale del Frignano – Zone A
- Parco Regionale del Frignano – Zone B
- SCI-SPA zones: IT4040002 Monte Rondinaio, Monte Giovo

MONTE CIMONE CORE AREA

- Parco Regionale del Frignano – Zone A
- Parco Regionale del Frignano – Zone B
- Parco Regionale del Frignano - Zone C
- SCI-SPA zones: IT 4040001 Monte Cimone, Libro Aperto, Lago di Pratignano

SASSI DI ROCCA MALATINA CORE AREA

- Parco Regionale dei Sassi di Roccamalatina (Central Emilia Parks) – Zone A
- Parco Regionale dei Sassi di Roccamalatina (Central Emilia Parks) – Zone B
- SCI-SPA zones: IT4040003 Sassi di Roccamalatina e di Sant'Andrea

MONTE CAIO CORE AREA

- Parco regionale Valli del Cedra e del Parma

BOSCHI DI CARREGA CORE AREA

- Parco regionale Boschi di Carrega Zona B
- SPA Zone: IT4020001 "Boschi di Carrega"

FIUME TARO CORE AREA

- Parco Regionale fluviale Taro Zona B
- SCI-SPA Zones: IT4020021 "Medio Taro"

RUPE DI CAMPOTRERA CORE AREA

- Riserva naturale orientata Rupe di Campotrera – zona 1
- Riserva naturale orientata Rupe di Campotrera – zona 2
- SPA Zone: IT4030014 "Rupe di Campotrera, Rossena"

MONTE PRINZERA CORE AREA

- Riserva Regionale Monte Prinzera
- SCI Zone: IT4020006 Monte Prinzera

AREE BUFFER

- Appennino Tosco-Emiliano National Park - Zone 2
- Appennino Tosco-Emiliano National Park - Zone 3
- Appennino Tosco-Emiliano National Park - State Nature Reserve Zone (RNS)
- Parco del Frignano (Central Emilia Parks) – Zone B
- Parco del Frignano (Central Emilia Parks) – Zone C
- Parco Regionale dei Sassi di Roccamalatina (Central Emilia Parks) – Zone A
- Parco Regionale dei Sassi di Roccamalatina (Central Emilia Parks) – Zone B
- Parco Regionale dei Sassi di Roccamalatina (Central Emilia Parks) – Zone C
- SCI and SPA zones: IT4020020 Crinale dell'Appennino parmense; IT4030001 Monte Acuto, Alpe di Succiso; IT4030002 Monte Ventasso; IT4030003 Monte La Nuda, Cima Belfiore, Passo del Cerreto; IT4030004 Val d'Ozola, Monte Cusna; IT4030005 Abetina Reale, Alta Val Dolo; IT4030006 Monte Prado; IT4040001 Monte Cimone, Libro Aperto, Lago di Pratignano; T4040002 Monte Rondinaio, Monte Giovo; IT4040003 Sassi di Roccamalatina e di Sant'Andrea
- SCI Zones: IT4030008 Pietra di Bismantova; IT4030009 Gessi Triassici
- Area Contigua (adjacent area) del Parco del Frignano
- PTPR (Regional Territorial Plan and Landscape) art. 19
- Parco regionale Boschi di Carrega Zones B, C
- Parco Regionale fluviale Taro Zones B, C
- Parco regionale Valli del Cedra e del Parma – adjacent area

WHICH INDICATORS OR DATA ARE USED TO ASSESS THE EFFICIENCY OF THE ACTIONS/STRATEGY USED?

At present, in the territory included in the National Park and in the Regional Parks and Reserves, actions and indicators are selected annually, and the level of achievement of targets is measured so that the effectiveness and efficiency of the Bodies (performance plans) can be assessed. Specifically in terms of natural conservation, special funding from the Ministry of the Environment and of Regions was used recently to start a monitoring campaign for the species and habitats of Protected Areas. Throughout the area of the Reserve a range of institutions and private companies are carrying out numerous programmes and projects funded by the EU to select suitable objectives, indicators and targets for the management strategy of the Reserve. These actions can be considered strategic for the Reserve purposes.

The extension of continuity and operationality of the Reserve management plan also to the territories included in the enlargement of the Reserve will allow coordination and optimisation on an appropriate scale of the data monitoring activities and the selection of effectiveness indicators for the actions and strategies used in the field of landscape and ecosystem conservation.

It may be useful to refer to information about: the number of farms that use environmentally friendly approaches and organic methods; the introduction of agricultural and environmental measures to preserve open spaces and restore meadows and associated salvaged areas; the upkeep, conservation and restoration of crucial elements of the agricultural ecosystem and the rural landscape; the introduction of sustainable forestry management systems; the area covered by certified woodland and forests; and the number of informative/training measures/initiatives for farmers, breeders and forestry associations.

14.2. AT THE LEVEL OF SPECIES AND ECOSYSTEM DIVERSITY:

IDENTIFY MAIN GROUPS OF SPECIES OR SPECIES OF PARTICULAR INTEREST FOR THE CONSERVATION OBJECTIVES, ESPECIALLY THOSE THAT ARE ENDEMIC TO THIS BIOSPHERE RESERVE, AND PROVIDE A BRIEF DESCRIPTION OF THE COMMUNITIES IN WHICH THEY OCCUR.

The species of particular interest for EU or regional conservation objectives are listed in the annex entitled “Species Table A – Identification Profile”.

Associations of significant species and the living environments are outlined in the annex entitled “Description of habitats”.

Mention is made of the list of relict species present (especially in the ridge areas) in the territory of the Reserve and how these are motivated by the particular climate of the area (climatic boundary, transition areas). Furthermore, these species may be naturally particularly sensitive to the dynamics related to climate change in an area that can be defined as highly sensitive (climatic boundary):

Glacial relict species of the Appennino Tosco-Emiliano National Park:

FAUNA

- Snow vole (Chionomys nivalis) rodent

FLORA

- Snowbed willow
- Finely toothed willow
- Dwarf cudweed
- Alpine plantain
- Alpine moon daisy
- Snowbell
- Mountain chickweed
- Carex foetida
- Cotton deergrass wetlands
- Eriophorum scheuchzeriwetlands
- Brown clover wetlands
- Jacquin's Rush wetlands
- Rusty-leaved alpenrose moorland
- Black crowberry moorland
- Highland rush talus
- red Alpine catchfly talus

Refer to annexes ("Species Table and Management Measures") for the complete list of species underlining species of high particular conservation interest of the Reserve candidate area.

WHAT ARE THE PRESSURES ON KEY SPECIES? IN OTHER WORDS: WHAT ARE THE THREATS (EXAMPLE UNSUSTAINABLE MANAGEMENT OF FOREST), THEIR IMMEDIATE CAUSES (DRIVERS OF CHANGE LIKE FOREST CHANGE OR HABITAT CHANGE), THEIR UNDERLYING CAUSES (EXAMPLE OVERGRAZING, FIRE, POLLUTION), AND THE MAIN DRIVING FORCES (EXAMPLE: ECONOMIC, POLITICAL, SOCIAL, EXTERNAL, ETC.) AND THE AREA(S) CONCERNED?

Details of the specific threats for animal and plants species, habitats and environments are provided in the annex entitled "Species Table – Management Measures". The table provides an identification code for each specific threat, with an accompanying general overview and analytical description. For each threat, there is information about the elements under threat (habitats, animal and plant species, and environments) and an assessment of the impact of the threat.

WHAT KIND OF MEASURES AND INDICATORS ARE CURRENTLY USED, OR PLANNED TO BE USED TO ASSESS BOTH SPECIES GROUPS AND THE PRESSURES ON THEM? WHO UNDERTAKES THIS WORK, OR WILL DO SO IN THE FUTURE?

The Biosphere Reserve management team will be responsible for identifying and monitoring appropriate indicators for the objectives. With the assistance of the relevant Networks, it will be able to draw up the most suitable plan.

The Appennino Tosco-Emiliano National Park and Regional Parks Conservation Service departments, are a team of knowledge and skills able to select the best possible present and future plans.

WHAT ACTIONS ARE CURRENTLY UNDERTAKEN TO REDUCE THESE PRESSURES?

Gli interventi per la riduzione degli impatti negativi sulle specie e gli habitat sono indicati all'allegato "Tabella B delle specie – misure gestionali", sotto le voci: indicazioni gestionali; attività da regolamentare; interventi da realizzare; attività di informazione/didattica.

AZIONI RIVOLTE ALLA CONSERVAZIONE CON STUDI/PROGETTI/RICERCHE CONDOTTE E IN CORSO:

Details of the actions taken to reduce pressures on species and habitats are provided in the annex entitled "Species Table B – Management Measures" under the following headings: management instructions; activities to be regulated; actions to perform; information/education activities.

CONSERVATION-ORIENTED ACTIONS WITH STUDIES/PROJECTS/RESEARCHES DONE AND IN PROGRESS:

In the last years following the designation (2015), the National Park, coordinator of the Reserve, has expanded its work related to wildlife conservation and monitoring activities beyond its administrative borders.

In particular, the WAC (Wolf Apennine Center) of the Appennino Tosco-Emiliano National Park and its staff belonging to the Wildlife Conservation Office are the main contacts in the management of problems relating to coexistence with the wolf, not only within the area pertaining to the Park, but also well beyond its administrative boundaries, specifically in the entire area of the Biosphere Reserve, thanks to the subscription of formal agreements with other territorial bodies and associations involved in the regulatory profile in the conservation of the wolf . Recently the Wolf Apennine Center signed two important agreements in the direction of a large-scale management of the species: one with the Emilia - Romagna Region and one with the Liguria Region. Thanks to all the agreements in place, the problems relating to the presence and return of the wolf can be addressed in a coordinated and shared way in the approaches and in the search for solutions. Adopting methods of analyzing the "wolf phenomenon" and homogeneous management, overcoming administrative boundaries and the fragmentation of skills is required by both the National Action Plan for the conservation of the wolf and the European Action Plan

All the activities carried out in the context of biodiversity conservation financed by the Ministry of the Environment (ex Chapter 1551), including monitoring actions at ecosystem levels, genera and species, go beyond the borders of the National Park to also affect the MaB area. especially with particular reference to national emergencies and all LIFE projects in progress or just concluded:

- LIFE GYPSUM on the study and protection and natural rehabilitation scheme of habitats linked to chalky formations and the study and protection of Chiroptera populations
- LIFE EREMITA related to the conservation of residual populations of 4 species of invertebrates;
- LIFE EX-TRA on improving the conditions for the conservation of large carnivores - transfer of best practices;
- LIFE M.I.R.C.O. to minimize the impact of stray dog phenomenon on wolf conservation in Italy);
- LIFE BARBIE concerning the reintroduction of the Canine barbel and the Italian barbel in the Emilian tributaries of the Po river.
- LIFE agriCOlture on good practices for a sustainable management of soil

In particular, the Project LIFE M.I.R.C.O. - lupo, started on 1 January 2015, addresses the issue of problems related to stray dogs in partnership with the Gran Sasso and Monti della Laga National Park. The aim of the project is to reduce the impact of stray dogs on wolf conservation, by acting locally but in this sense representing a pilot project whose solutions can and will be replicated on a larger scale. The presence of uncontrolled and / or poorly managed dogs is a threat to the conservation of the wolf

The project aims to:

- Develop a definition of wolf-dog hybrid;
- produce estimates relating to the prevalence of the phenomenon of hybridization at the local level;
- monitor the phenomenon upstream and downstream of management interventions; develop a participatory and shared decision-making process on hybrid management;
- provide the competent administrations with clear and unambiguous information, raise awareness and inform public opinion, actions carried out and made available in the entire Biosphere Reserve;
- verify the effectiveness and sustainability of hybrid capture and sterilization interventions

It is essential to consider the fact that the hybridization between wolf and dog represents a phenomenon that must be addressed by management on a geographical scale appropriate to the relevant species, in particular its ability to spread over long distances. Removing hybrid individuals within a given area may not have an effect in the medium and long term if neighboring areas host other hybrid individuals potentially able to recolonize the area. Since the MIRCO-Lupo project was carried out within two national parks, surrounded by provincial and regional areas in which different territorial units of wolves with the presence of hybrid individuals have been detected, this problem is faced on the basis of three complementary approaches:

- the local neutralization of the reproductive potential of hybrids according to procedures that do not involve the creation of territorial hiatus;
- the experimentation of management strategies useful for fighting the phenomenon, in particular by evaluating its functionality, applicability and

economic and social sustainability, identifying them as 'good practices' to be exported elsewhere and over a wider area;

- the assessment of the long-term sustainability, on each protected area, of the strategy developed for controlling the phenomenon

The Life agriCOlture project, as part of the LIFE CCM 2018 program, aims to introduce governance actions and good agronomic practices for sustainable soil management in mountain areas of the Emilian Apennines subject to hydrogeological instability and abandonment in order to demonstrate their effectiveness in the accumulation and conservation of organic carbon and in the recovery of marginal and unstable agricultural soils.

The LIFE EREMITA Project aims to ensure better conservation conditions on the territory of the Emilia-Romagna Region for the residual populations of two priority saproxylic insect species, that is, which in some phase of their life cycle depend on the wood of dead trees (Osmoderma eremita and Rosalia alpina) and two species of lentic and lotic waters, that is, living in the waters of ponds and pools or in the waters of streams and streams (Graphoderus bilineatus and Coenagrion mercuriale castellanii), intervening on threatening factors of human origin.

The five-year project was approved by the European Commission in May 2015, started on 1 January 2016 and will end on 31 December 2020. The general objective will be pursued by implementing concrete conservation actions, carried out in an integrated and

- *Figure 14.1 - The cows of Parmigiano Reggiano PDO, grazing..*

coordinated way among all the project partners, on the entire territory of Emilia-Romagna. Specific objectives of the actions are:

- increase knowledge about the presence / absence, distribution and abundance of the sub-populations of the target species in the entire area;
- increase the availability of habitats for residual populations and improve their connectivity;
- develop a long-term management strategy (management plans and specific conservation measures);
- promote correct behavior compatible with the protection needs of interest groups;
- disseminate and develop solutions for the active involvement of citizens and the various stakeholders.

Concrete conservation actions, such as the creation of habitat trees, the restoration of forest microhabitats and lentic and lotic water habitats, ex situ reproduction (captive breeding), reintroductions / restocking of reproduced animals together with the translocation of captured specimens , not only will they favour the maintenance of viable populations capable of sustaining a flow of individuals towards neighbouring areas but they represent an absolute novelty in the national context, taking an important experimental character. The project was approved by the European Commission in May 2015 for a total amount of € 2,126,987.00 of which 1,268,863.00 from a European co-financing (€ 774,862.00 referring to the activities of the Emilia-Romagna Region as beneficiary in charge coordination). The objectives of the project will be pursued through concrete and integrated actions on a regional basis. Some of these actions will be of an experimental nature because they have never been attempted in Italy before. Action will be taken on the socio-economic context of the project territory, because the main cause of the threats to these species is human behaviour. The following specific objectives are envisaged:

- increase the knowledge concerning the presence / absence, distribution, abundance of the residual population of the four insect species
- increase the availability of habitat for residual populations, also improving their connections
- develop a long-term management strategy, the drafting of management plans and specific conservation measures are assumed
- to create from scratch a regional network of specific habitats capable of hosting the species of the four insects
- promote correct behaviour compatible with the protection needs of interest groups, disseminate and develop solutions for the active involvement of farmers, managers and users of forest areas within the Natura 2000 network as well as stakeholders in general.

With the proposed enlargement of the Reserve, the bodies responsible for governing and managing the other Protected Areas included, will be able to support these projects and / or provide tools and means to extend conservation measures and related monitoring. In particular, the important contribution that can come from the Management Body for Parks and Biodiversity of Central Emilia is emphasized, which in the field of conservation and monitoring has an important portfolio of projects and collaborations: the Frignano Regional Park has carried out numerous activities of specific research and supported graduation thesis on rare and endangered plants, bilberry, state and quality of lake water, vertebrate fauna, agriculture, farming

companies, presence of golden eagles; the Regional Park of the Sassi di Roccamalatina, in particular with the monitoring activity relating to the almost thirty-year project (since 1991) for the protection, study and restoration of the population colony of the Common swift (Apus apus) through the restoration of the ancient Torre Rondonara del Castellaro.

WHAT ACTIONS DO YOU INTEND TO TAKE TO REDUCE THESE PRESSURES?

As stated in section 14.2.2, details of the actions taken to reduce pressures on species and habitats are provided in the annex entitled "Species Table– Management Measures". Information about realisation times and costs are provided where possible, along with an assessment of the proposed measures.

General measures to reduce the pressures (such as climate change) on habitats and species will be continued and supplemented. These initiatives include efforts to raise awareness about sustainability, renewable energy, reducing consumption and sustainable access.

14.3. AT THE LEVEL OF GENETIC DIVERSITY:

INDICATE SPECIES OR VARIETIES THAT ARE OF IMPORTANCE (E.G. FOR CONSERVATION, MEDICINE, FOOD PRODUCTION, AGROBIODIVERSITY, CULTURAL PRACTICES ETC).

A number of species that are important for the conservation of genetic diversity in the candidate Biosphere Reserve have been examined in specific studies, especially as part of LIFE projects. They include: Italian Wolf; Silver fur, European spruce tree, beech and yew; Herbaceous ridge species. Details are available in the Candidature dossier (enclosed).

The genetic variety in the typical crops and animals is of relevance for the quality of the product available on the territory. Besides traditionally recognized varieties some can also boast a documented genetic characterization:

- Cornigliese Sheep; Apennine Horse, Treschietto Onion (Details are available in the Candidature dossier(enclosed).
- A quality product such as Parmigiano Reggiano PDO owes its origin and spread to the breeding of two cattle breeds: the Reggiana red cow (or Reggiana cow or "Reggiana red") and the Bianca Valpadana - Modenese (or commonly Bianca Modenese) breed. Over the last two centuries, both breeds have had a common history, strongly linked to the success of Parmigiano Reggiano PDO, and characterized by a "golden period" in the mid-twentieth century and by an immediately following "crisis" which continued until the today, up to the implementation of enhancement and conservation projects.
- The Reggiana cow is classified among the cattle populations descended from the Bos Brachicerus. According to reliable historical sources, the origins

of the Reggiana breed lie in the invasion of Italy by the Lombards. They moved into Friuli in the year 568 and when they settled in the Po Valley, they brought with them herds plundered from the large Pannonian Plain. Many of these cattle, mainly Podolic cows, had wheaten-coloured coat like the kernels of wheat, a dominant characteristic inherited from the old breeds of red cows from the steppes that can still be found today in Ukraine and Central Russia. The first references to the "Reggiana breed" are reported by monks in the year 1000 and certainly the population spread constantly in the territories of Parma and Reggio Emilia until the nineteenth century. Between the beginning and the middle of the last century there was a great increase in the number up to 140,000 heads. After the 1950s, the breed underwent a rapid decline linked to the replacement in the milk supply chain by more productive cosmopolitan species introduced from abroad. In 1981 the historical minimum of the population was reached, which was reduced to 450 cows. Following conservation projects and the action of the "Consorzio Vacche Rosse", established in 1991, the production of Parmigiano Reggiano from Reggiana cow milk has allowed to reverse the trend and today there are a total of about 3000 heads. Milk from the Reggiana cow has been extensively studied in the past by various authors. The results of these researches have shown that this milk has all the chemical-physical characteristics ideal for the production of Parmigiano-Reggiano cheese and demonstrated that the milk of this cow, compared to that of other cosmopolitan breeds, is richer in proteins, caseins, calcium, phosphorus and it is more acidic and it has lower chloride levels. More recent studies have confirmed that Reggiana milk's superior quality is partly thanks to genetic factors associated with the different types of casein (such as □, □, □ and □) and variants thereof (such as A and B) in the milk. Reggiana cows have very high allele frequencies for the B variant of k-casein and □-casein. This has a positive impact on the technological quality of milk, which means that there is a greater cheese yield, less waste, and the cheese produced is more suited to maturing. Reggiana cows have very interesting zootechnic characteristics but their productivity in quantitative terms is lower than that of more widespread breeds. Consequently, they can only compete if the economic value of their milk is highlighted and appreciated. The use of pure Reggiana milk to make Parmigiano Reggiano cheese has played a decisive role in the revival of the breed. Its dairy qualities have helped to provide tangible proof that Reggiana cattle can offer farmers good prospective income because it can be used to make superior quality cheese that can be sold for higher prices than the market average for Parmigiano Reggiano.

- The Bianca Modenese has origins common to the Reggiana breed and probably it derives from wheathen-coloured coat cattle crossed on several occasions with grey cattle of the podolic type. The breed originates in the area of Carpi, so much so that traces of it are found in documents from the mid-nineteenth century which mention the "Carpigiana" breed. Following its rapid spread in the Province of Modena it was officially called "Modenese" as early as 1880. The continued diffusion led in 1935 to the approval of the breed standards by the Ministry of Agriculture which defined it as the "Val Padana breed". In 1944 140,000 heads were registered as "Val Padana" to which another 100,000 as the "Carpigiana" breed were added. In 1955 there were still 200,000 heads, about 52% of the cattle reared in the Province of Modena. From here on the population undergoes a slow and steady decrease and a strong replacement by breeds such as the Friesian or the Alpine Brown, introduced from abroad because they are more productive and suitable for

mechanical milking. In 2005 the heads of Bianca Modenese were reduced to about 800 of which 258 (and only 11 bulls) registered in the National Herd Book of the breed (established in 1957). The Modenese cow spread rapidly in the nineteenth century as it is a rustic and adaptable breed, capable of exploiting the forage resources of the plains and hills and recovering from a poor state of nutrition due to drought years or long and cold winters. In addition, the aptitude for cheese making which was then privileged was combined with high yield at the slaughterhouse and adaptation for work in the fields. Historical and current studies continue to recognize the peculiar characteristics of Bianca Modenese milk: it has an ideal fat-protein ratio (1: 1) and a high frequency of the K-casein B gene, which leads to easier processing of the milk and fewer problems in the complex process for the production of Parmigiano Reggiano. Since 2005, the breed has been the subject of a provincial recovery project with the aim of defining its genetic situation, allowing a careful selection of the animals, the purchase of breeding stock, the creation of business units, the continuation of embryo transfer and semen collection. This project led in 2005 to the production of the first wheels of Parmigiano Reggiano using only Bianca Modenese milk and in 2011 to their marketing. The same project has allowed a collaboration with Slow Food which has set up a presidium on the Bianca Modenese breed and led in 2006 to the establishment of a consortium of breeders and producers, the "Consortium for Valorisation of the Bianca Valpadana - Modenese breed Bovine Products"

WHAT ECOLOGICAL, ECONOMIC OR SOCIAL PRESSURES OR CHANGES MAY THREATEN THESE SPECIES OR VARIETIES?

The reappearance of wolves where they had been absent for many decades has led to renewed conflicts with groups of stakeholders, mainly in the shape of farmers and hunters. Regions and Provinces started several projects to deal with these problems, by also creating (for Emilia-Romagna) a digitalized database with genotypes of the individuals in the territory.

Chestnut groves – a unique resource in the cultural landscape of the Appennino – is now at risk due to diseases and biological attacks (e.g Asian chestnut gall wasp) and partly due to neglect. While chestnut growing is no longer a core part of the mountain economy, despite the implementation of projects to enhance its cultural character and projects to convert old buildings that were once used for drying chestnuts for accommodation purposes and the PDO chestnut flour production on the Tuscan side of the Area.

Due to the current climate changes, in particular temperature increase, two main trends are identified: a rapid increase of both extension and volume of the forest over the last 5 decades; migration to higher altitudes by the herbaceous species that are currently found in the summit meadows, therefore leading to clashes and continual erosion of the habitats available.

WHAT INDICATORS, AT THE LEVEL OF THE SPECIES, ARE USED, OR WILL BE USED, TO ASSESS THE EVOLUTION OF POPULATION STATUS AND ASSOCIATED USE?

The Biosphere Reserve management team will be responsible for identifying and monitoring appropriate indicators for the objectives. With the assistance of the relevant Networks, it will be able to draw up the most suitable plan.

WHAT MEASURES WILL BE USED TO CONSERVE GENETIC DIVERSITY AND PRACTICES ASSOCIATED WITH THEIR CONSERVATION?

The management strategy for the study and conservation of genetic diversity and associated practices will be decided systematically and methodically once the management committee has been formed. At present, there are some outstanding examples of in situ and ex situ conservation and management throughout the candidate territory. First of all, there are numerous LIFE projects put in place in the territory and well described in this dossier. In addition, outstanding conservation work for the wild and cultivated genetic heritage is carried out by the Millennium Seed Bank at Kew Gardens (London), the Regional Seed Bank ("Banca del Germoplasma della Garfagnana"). It is worth mentioning also the " Coltivatori Custodi" project. Please find enclosed a list of species collected and sent to the Millennium Seed Bank at Kew Gardens.

15. DEVELOPMENT FUNCTION

15.1. POTENTIAL FOR FOSTERING ECONOMIC AND HUMAN DEVELOPMENT WHICH IS SOCIO-CULTURALLY AND ECOLOGICALLY SUSTAINABLE:

DESCRIBE HOW AND WHY THE AREA HAS POTENTIAL TO SERVE AS A SITE OF EXCELLENCE/MODEL REGION FOR PROMOTING SUSTAINABLE DEVELOPMENT.

The MaB territory fully qualifies for being considered as a model of sustainable development for the entire Apennine chain and, more in general and with the necessary variations, for all the mountain areas where there is a significant presence of man up to the ridges.

In this territory the following factors occurred at the same time in the last decades: a) a strong return to nature (increased forest cover, return of wild animal species, such as wolves and eagles and other similar factors); b) a shift – that can also be marked by conflict – to a new vision of its identity, potentialities and vocations (after a period of peripheral and cultural subordination to the industrial and manufacturing models in the neighbouring plain and coastal areas); c) the launch of new economic networks more oriented to environmental quality. In other words, this territory is increasingly becoming a place of coexistence and represents a new balance within the biosphere. One of the main issues resides in soil erosion and in some cases in the serious loss of human capital, especially in the high ridge lands. The proposal of enlargement encompasses territories that are going to enable the MaB Reserve to put into play a greater number of major players belonging to different contexts in transition (mountain areas, hilly areas, areas bordering the plain), thus increasing the potential for expression of the human component, which, if inspired and guided on environmental issues and sustainability, will be able to bring about great added value.

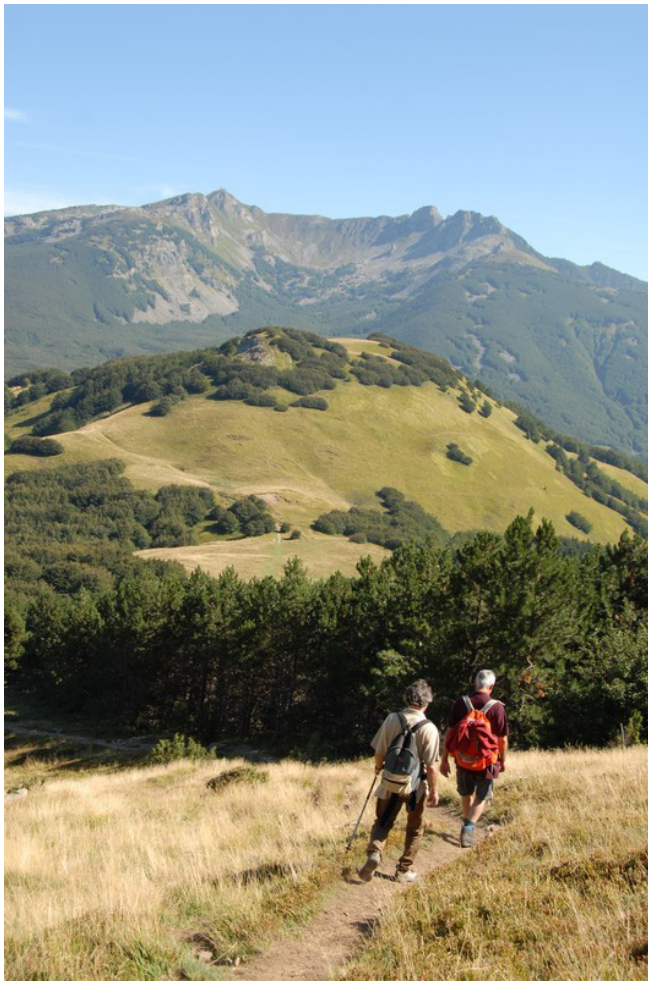
Most of all thanks to the actions undertaken by the Appennino Tosco-Emiliano National Park (that is concretely acting as a research and sustainable development agency with its ongoing projects), it has been possible to investigate the coexistence between man and nature, original education experiences on sustainability and the teaching of natural sciences. The enlargement proposal envisages a reinforced scenario in this respect, given that the other regional parks now involved (Parchi del Ducato, Parchi dell'Emilia Centrale) also carry out enhancement, education and promotion actions in support of sustainable tourism and sustainable development in a more general sense.

Moreover, thanks to the fundamental and strong and consolidated collaboration with the Local Authorities and the LAGs (local action groups) and with the concerted management of the Rural Development Plans, many agricultural and tourist enterprises – also cooperatives – were motivated and involved in the creation of networks fostering relations between agricultural, zootechnical and sylvo-pastoral traditional and high-quality activities. In response to the demand for experiential tourism, wellness tourism and enrichment tourism that is growing all over the world, activities related to naturalistic and cultural tourism have been planned and implemented. These, with various expressions, link the offer of flavors, traditions, sociability, to the territory and its naturalistic / environmental aspects. Furthermore, in the area of the Reserve, agriculture and tourism are not the exclusive prerogative of the entrepreneurial fabric, but are, increasingly, an important supplement to the income even of

families employed in other sectors. Since generally in mountain contexts the service sector is now mature and well developed, and indeed often has difficulties due to the decreasing number of users, it is particularly important to create attractive jobs and businesses for young people to ensure the stability of the social fabric.

This process is particularly significant from the perspective of the "metro-mountain pact" which provides answers to the growing needs for the use of natural and cultural resources by the closest urban communities.

- *Figure 15.1 - Passo dell'Ospedalaccio - Alta Via dei Parchi*



The integration of training, quality agriculture and eco-tourism, can be the means by which to create new employment and continue to involve communities and the local economic fabric in the protection and enhancement of the ecosystem and cultural mosaic of the territory, giving them perspectives of sustainable and rewarding economic and social development. With this respect, the success of the initiatives consolidated and / or undertaken in the recent years concerning "community tourism" and the in-depth studies and exchanges relating to the topic of socially responsible Companies is to be highlighted (International Workshop on "Social Enterprises role for UNESCO Biosphere Reserve development" October 2017). Furthermore, the image of the territory was taken care of through a path started after the 2015 designation and still active today, aimed at defining and applying a branding strategy (I CARE APPENNINO) that includes people, motivations and values on the one hand, and products and destinations on the other. Along the way, many meetings were held on a local scale as well as discussion forums with other Reserves of the international network (eg "Swedish Biosphere Reserve Fall Educational Tour" in the Tuscan-Emilian Apennine Biosphere Reserve, 16-19 October 2018).

Always in line with maintaining the balance between traditional practices and the biosphere, strengthening its stability and promoting its development, the Biosphere Reserve of the Tuscan-Emilian Apennines has become the coordinator of an international project involving beekeepers, both professionals and amateurs, of their own territory. The MEL project "Network of beekeepers in the Mediterranean Biosphere Reserves" aims to promote biological and cultural diversity in beekeeping, through cooperation between the Biosphere Reserves on the different shores of the Mediterranean Sea. One of the main objectives of the project is to present and promote the Biosphere Reserves as places of

excellence for the production of honey and beekeeping derivatives, creating and promoting networks of beekeepers active within them.

For this reason, the Mediterranean Biosphere Reserves Network promotes this project, favoring a currently consolidated partnership between 5 UNESCO MaB Reserves. The project partners, in addition to the Biosphere Reserve of the Tuscan-Emilian Apennines, are the Biosphere Reserves "Terres de Ebre" (Spain), "Valleé du Fango" (France), "Jabal Moussa" (Lebanon) and "Djebel Bou-hedma" (Tunisia). The most relevant good practices collected and the results of the surveys were presented within an International Workshop that took place in Lunigiana (in the province of Massa-Carrara MS) in the spring of 2019.

With a view to increasing the awareness of local populations with respect to the designation obtained in 2015, of the future prospects arising, and in general of the sustainable development of the territory within the Reserve, numerous public meetings have been held in recent years, aiming both the general public and some specific stakeholders (with diversified interlocutors: teachers, students, inhabitants and tourists). For example, the "Behind food sustainability" exhibition, set up for Expo by UNESCO Italy and enriched with a session on the Tuscan-Emilian Apennine Biosphere Reserve, generated a basic knowledge and called to participation. The exhibition was set up in over 22 different venues (and is still touring) within the Reserve and in the neighboring territories that are currently involved in the enlargement proposal; in about 250 days of exhibition it was visited by 8040 people, including many students belonging to schools of all levels, and was the subject for 5 training sessions for teachers. This set of actions and programmatic lines configure lifestyles, production, consumption that can on the one hand make the area more attractive and on the other can be of great interest.

HOW DO YOU ASSESS CHANGES AND SUCCESSES (WHICH OBJECTIVES AND BY WHICH INDICATOR)?

The indicators which will allow an assessment as to whether the workshop on the sustainable development of the Tuscan-Emilian Apennines is working effectively will be connected to the tourist and agricultural function of the territory. As regards tourism, we will use the set of indicators defined by the Appennino Tosco-Emiliano National Park and by the Central and Western Emilia Parks Management Bodies upon signing of the European Charter for Sustainable Tourism in Protected Areas (ECST) , which will be extended and harmonized throughout the entire territory of the Reserve.

As regards agriculture, we will use the indicators that monitor the trends of the Utilised Agricultural Area and the forest resources, the development of organic agriculture and the PDO and PGI productions, and the creation of new agricultural enterprises (especially those run by young people).

More generally, we will monitor the demographic trend and the employees per sector in the MaB Area and, in particular, in the ridge municipalities, since the presence of man on the territory represents one of the fundamental elements for the perpetuation of the balance between man and biosphere.

The Tuscan-Emilian Apennine Biosphere Reserve, with regard to the development function, aims to:

Figure 15.2 - A stretch of the "Via Francigena.

- Preserving and upgrading the landscapes linked to traditional agro-sylvo-pastoral activities, which are nowadays at risk of reduction or abandonment, for example the Parmigiano Reggiano PDO hill pasture areas, ridge grazing lands and terracing in Lunigiana and Garfagnana. "Cultural landscapes" underlying ecosystems that function in harmony with quality human activities; good quality physical resources and processes that form the natural capital in which to invest for the future.

- Support extensive and quality mountain agriculture. In agriculture, the recovery and protection of social and cultural diversity linked to the characteristics of the territory are elements capable of counteracting well-known phenomena in rural-marginal areas, such as: unemployment, disaffection of young people, aging of the population, depopulation, fragility of the territory.

- Make the most of socio-economic diversities intended as a pool of competencies: which means supporting typical and quality productions (PDO, DOCG Guaranteed and Controlled Designation of Origin, PGI etc.), organic agriculture and sustainable forestry; promoting the multifunctional role of agriculture (in particular with respect to land conservation, the production of renewable energy and the rural tourism offer); encouraging a return to micro-farming also by rediscovering or valorising "new heirloom" crops

- Promote sustainable tourism by raising the awareness, based on the principles of the European Charter for Sustainable Tourism in Protected Areas (ECST), of the importance of rationalizing and managing the environmental impact of the tourist flows; through the development of eco-tourism and naturalistic tourism (also with relation to school tourism); the attention to territory accessibility for a correct use; the support to forms of Community Responsible Tourism by innovating the available offer throughout all seasons and all over the territory; the support for the relationship between tourism and the Agri-food sector.

- Foster culture and history: highlighting the history of the intrinsic relationship between man and biosphere through the signs and the study of past ages, such as the Stele statues of Lunigiana, the remains of the Ligurian settlements, from the ancient Roman roads (Parma-Luni, Parma Lucca Luni-Lucca), to medieval historical-religious itineraries, the heritage of castles and parish churches dating back to the Matilda of Canossa period, the castles and the palazzi of the Malaspina, Este and Vallisneri families, up to the "Maggio drammatico" (a form of epic folk theatre), the modern age, from the Italian Risorgimento which led to unification up to the Resistance fighting, until today.

15.2. IF TOURISM IS A MAJOR ACTIVITY:

Especially in the medium-high zone of the MaB area, tourism has always represented an important activity for short summer periods and, in some equipped areas, also in winter for winter sports (alpine and Nordic skiing, mainly in the Cimone area but not only there). Tourism, though, still represents a minor and supplementary economic industry compared to other fundamental and predominant activities such as agriculture, farming, agri-food production, craft and services. The return of families and people to their birthplace for holidays is a relevant contribution to traditional tourism.

Nevertheless, traditional holiday tourism is virtually over; and winter tourism in ski resorts is currently suffering from the consequences of climate change. Crescono d'altro lato i nuovi turismi della natura, dello sport, dell'educazione, dell'enogastronomia, del fine settimana. However new forms of tourism are growing, such as those linked to nature, sport, education, wine and food, and short stays for the weekends, concerning shorter periods of time but being better distributed throughout the different seasons. In the first few months of 2018, in continuity with the growth trends of 2017 (tourism trend: + 3.6% compared to 2016), the Apennines tourim recorded a growth amounting to around +4, 5% of arrivals and + 6.5% of presences for the hospitality sector of the Emilia ridge of the Reserve. The Italian clientele is increasing but the international clientele is even more so (+ 17.6% of arrivals and + 14% of presences) confirming the growing attractiveness of the territory as an environmental-natural and sporting destination.

In the spring and summer of 2020, at the end of the "lockdown" imposed in Italy to tackle the Covid 19 virus emergency and as an evidence of the changes induced by the pandemic, arrivals and stays in the

- *Figure 15.3 – Cross-country track Piandelagotti.*

Apennine villages increased significantly; this phenomenon is apparent, even if at the present date it cannot be statistically documented yet, as data is not yet available.

Also trekking keeps recording good and consolidated results, so that hikers are increasingly attracted also thanks to a rich network of mountain huts and to the increasingly numerous events organized by the various locations and villages, both during the winter and summer seasons.

Some studies (by the Catholic University of Piacenza) show that the official data are substantially underestimated.

DESCRIBE THE TYPE(S) OF TOURISM AND THE TOURISTIC FACILITIES AVAILABLE. SUMMARIZE THE MAIN TOURISTIC ATTRACTIONS IN THE PROPOSED BIOSPHERE RESERVE AND THEIR LOCATION(S).

The tourist offer available in the Biosphere Reserve is rich and diversified. The various tourism forms, some modern and some rooted in the territory's tradition and culture, are able to meet very different needs as to contents and different periods of the year. The main tourist activities which, due to the relevance of their offer package and their success, represent reference points for the area will be described in the following sections.

MULTI-PURPOSE TREKKING TOURISM

It includes different forms of tourism such as activities on foot, by bike, on horseback, with snowshoes, and so on. A list of the most important initiatives/places related to trekking tourism is presented below:

- **Alta Via dei Parchi**. This trekking route follows the whole Emilia-Romagna Apennine ridge, bordering with Tuscany, linking all the protected (regional and national) areas in this territory. Basically, the route retraces the Emilia-Romagna stretch of the most important 00 Italy Path (Sentiero Italia 00) of the CAI (Italian Alpine Club), which connects the entire peninsula and the Alpine chain. The section between the Passo della Cisa and Corno alle Scale of the Alta Via dei Parchi (and of the 00 Italy Path) which runs along the Apennine ridge -the boundary between the continental climate and the Mediterranean climate- represents the key area of the Appennino Tosco-Emiliano Biosphere Reserve, passing through the main Core Areas. It is accessible throughout the year although, due to the altitude, it requires quite different equipment in winter;
- **Lunigiana Trekking**. The Lunigiana Trekking trail consists of 250 km and 14 stages; it starts in Aulla, goes up to the Val di Magra as far as Pontremoli and finally goes down to Fosdinovo. The trail unfolds through the historical region of Lunigiana, that offers excellent conditions for trekking, mountain biking and horse riding. The Lunigiana Trekking trail intertwines with the Lunigiana Trekking Tourist System (Sistema Turistico Escursionistico Lunigiana - S.T.E.L.), which diagonally crosses the area and highlights the beautiful castles of this area, starting from the Terrarossa Castle, where two paths follow the River Magra banks before reaching the historical Lunigiana passes with Liguria and Emilia;
- **Garfagnana Trekking**, trail with a circular path made up of nine stages, which follows the Apennine and the nearby Apuan Alps ridges. The area also offers other trails suitable for climbing, hiking, mountain biking, and so on;
- **Spallanzani Trail** (CAI), focussing on geological characteristics within the National Park of the Tuscan-Emilian Apennines, dedicated to sites visited by the scientist Lazzaro Spallanzani back in the eighteenth century. The trail is 115 km long, comprising 7 stages, with a total elevation difference of 5,000 metres. It runs through all the vegetation sections of the Reggio Emilia Apennines, starting from Ventoso di Scandiano (130 m a.s.l.) and reaching the ridge at S. Pellegrino in Alpe (1,500 m a.s.l.).
- **Appennino Reale** (Royal Apennines). Appennino Reale is both the name of an area project and a winter event designed by the Tuscan-Emilian Apennines National Park and the Frignano Regional Park. The

event stems from the agreement between the two Park management Bodies to enhance new forms of sport and sustainable tourism in the ridge area between Monte Cusna and Monte Cimone, along the numerous scenic forest routes for trekking, mountain biking, cross-country skiing or horse riding between Emilia and Garfagnana. All of these trails pivot around the Abetina Reale, a place located about 10 km from any starting point reachable by car: Civago - Case Cattalini (Reggio Emilia), Prati Fiorentini Hut - Piandelagotti (Modena), Casone di Profecchia (Lucca), Pianvallese - Febbio (Reggio Emilia).

- **The Grande Ippovia** (the Great Horse Trail) which goes from the province of Piacenza to the province of Rimini, crossing the area of the Biosphere Reserve with numerous stops, and touching the National Park and the pre-hill area. Thanks to the wide choice of different routes, the Grande Ippovia offers solutions that can suit different needs and ages;
- **The mountain refuge network**, a set of trails connecting 9 different mountain refuges on the Apennine ridge, within the Biosphere Reserve.
- **Sentiero dei Ducati** (The Trail of the Duchies): created in 1992 based upon a collaboration between the Province of Reggio Emilia and CAI (the Italian Apline Club), it is a trail comprising various stages that goes up the Reggio Emilia side of the Val d'Enza from Quattro Castella to Passo Lagastrello, crossing an area of high interest within the Biosphere Reserve such as the Natural and Seminatural Landscape of the Collina Reggiana (Hills around Reggio emilia) - Terre di Matilde (the Lands of Matilda of Canossa), the Rupe di Campotrera Reserve, the Appennino Tosco-Emiliano National Park and 3 SCI sites. The path is at the centre of an eco-tourism relaunch project within the Reserve's Action Plan.
- **Ancient historic roads and pilgrimage routes**: they significantly affect the area of the Biosphere Reserve. The main roads / routes cross the territory in a north-south direction, thus turning out to be important communication routes between the Po Valley and northern Tuscany: the Via Francigena, the Via del Volto Santo, the Via di Linari, the Via Matildica del Volto Santo, the Via Romea Nonantolana, the Via Romea Strata, the Longobard Nonantolana section, the Via Vandelli, the Parma-Lucca and Parma-Luni ancient Roman roads , the Via degli Abati, the Piccola Cassia.
- **The Via Vandelli**: the Via Vandelli is an eighteenth-century road of the Estense Duchy which, starting from Modena, crosses the Tuscan-Emilian Apennines, by crossing the plains and the mountains around Modena through Pavullo nel Frignano and Lama Mocogno, then reaches the ridge by passing through Tuscany (Passo di San Pellegrino in Alpe), and goes down into the Serchio valley by crossing the Apuan Alps at Passo Tambura, to finally reach the sea in Massa. The route, about 150 km long, is extremely important for the history of the Italian and European road network. In the first half of the eighteenth-century, Duke Francesco III d'Este acquired the territories of Massa-Carrara and asked his trusted engineer, Domenico Vandelli, to build a road to connect the two capitals of the duchy, Modena and Massa. The final result virtually is the first "highway" of Europe, a paved road complete with taverns, inns and staging posts, through the Tuscan-Emilian Apennines and the Apuan Alps.
- **The Via Francigena**: described in Archbishop Sigeric's famous diary in 991 AD, the road represents one of the great European routes of the Middle Ages that united Great Britain and France to Rome. The itinerary involves the Biosphere Reserve precisely in the crucial passage of the Apennine passes, in

particular the Cisa Pass, after crossing Berceto (featuring a beautiful medieval cathedral), then descending into Lunigiana, touching the Pieve di Sorano (near to Filattiera) and descending again towards Lucca and Rome. The Via Francigena in its many variants represents a prominent element within the Apennine trekking tourism and is still today experienced by many as a real religious pilgrimage.

- **Via Matildica del Volto Santo**: a route that connects two important cities of the kingdom of the Grand Countess, Matilda of Canossa, being recognized and officially included in the Italian Ministry's Atlas of the Paths, which involves cultural itineraries of particular importance at both European and / or national level. This route can be traveled either on foot or in other sustainable, soft mobility ways. Divided into sections, it crosses the territory of the Reserve in the section called "del Volto Santo" and in the section "of San Pellegrino", crossing the municipalities of Reggio Emilia, Vezzano sul Crostolo, Canossa, Casina, Carpineti, Toano, Gazzano, San Pellegrino in Alpe, and Barga.

- **Via del Volto Santo**: like the Via Bibulca (between alto Frignano and Garfagnana), the route known as Via Matildica del Volto Santo represents one of the most important local variants of the Via Francigena and from Pontremoli it heads towards Fivizzano and then goes up to the Carpinelli pass and then descends to Lucca along the Serchio river, through the Garfagnana area. The itinerary in the Lunigiana area, from Pontremoli to the Argegna Sanctuary, is 63.5 km long. It crosses the Municipalities of Pontremoli, Filattiera, Bagnone, Licciana Nardi, Fivizzano Piazza al Serchio, Casola in Lunigiana, Castelnuovo di Garfagnana, and Barga. The road route, marked with tourist information, is also a trekking route. The Via Matildica del Volto Santo and the Parma-Lucca and Parma-Luni ancient Roman Roads are the object of recovery and enhancement projects included in the Action Plan of the Biosphere Reserve.

- **Cammino di Santa Giulia**: route reminiscent of the translation of the remains of Santa Giulia, commissioned in the Lombard period that connects Livorno to Brescia through the Apennine ridge between Foce a Giovo and San Pellegrino in Alpe passes, through the territories of Pievepelago, Fosciandora, Pieve Fosciana, Castiglione in Garfagnana, and then descends towards Frassinoro, Montefiorino, Monchio (Palagano). The route crossed the Via del Saltello. The Via del Saltello, with its multiple options, allowed in a certain historical period the connection to the Modena side and was therefore an important crossing point for Ceserana (Estense), Lupinaia (Lucchese) and Barga (Fiorentina).

- **Via Romea Nonantolana**: a route that runs along the central part of Emilia up to the Via Francigena, between Modena and Pistoia. It takes its name from the Benedictine abbey of Nonantola, which was one of the landmarks of European spirituality in the Middle Ages and which needed to connect with other hospices and monasteries located on the ridge and then with Rome. The Via Romea Nonantolana soon became one of the main axes of communication between northern Italy (and central Europe) and Rome, the seat of the papacy, and was trodden by armies, kings, travelers and pilgrims.

- To the already rich picture of **hiking and trekking trails** presented up to now for the Biosphere Reserve, we must add the significant network of trails, for a total of 100 km in length distributed over 18 itineraries, present in the Core Area of the Sassi di Roccamalatina (MO).

WINTER TOURISM

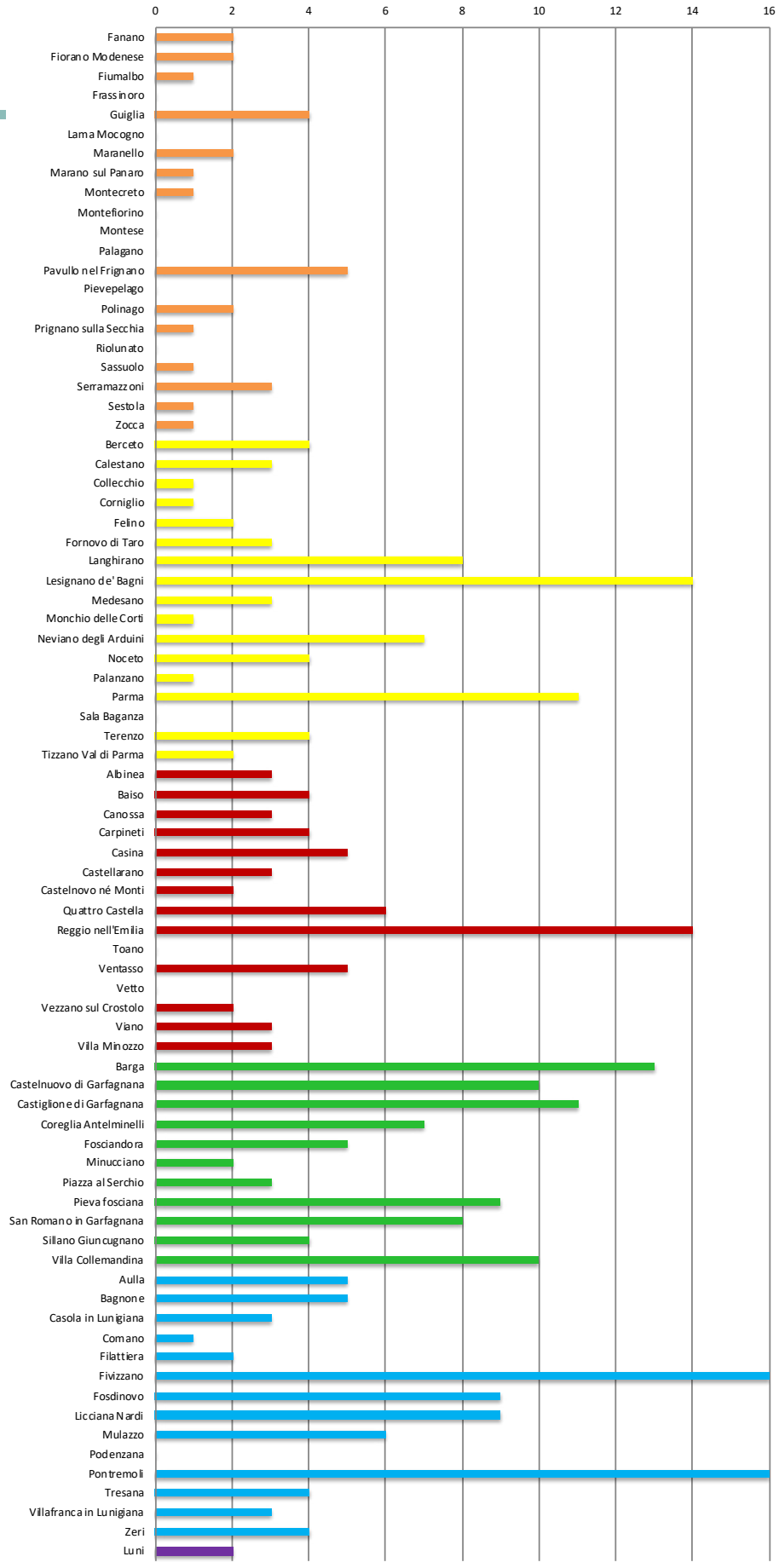
Winter tourism concerns any event/place linked to the typical activities of the winter period

Over the last 60 years, some ski resorts for downhill skiing have been established and developed on the northern side of the ridge, although they have been recently influenced by frequent market and "model" crises, especially in relation to climate change, given the fact that skiing facilities are located between 1000 and 2000 m; however, this is not the case instead for the skiing facilities built on the Modena Apennine side of the Reserve, which saw their birth back in the 1930s and, after several upgrades and expansions, are still characterized by a great solidity and a strong economy.

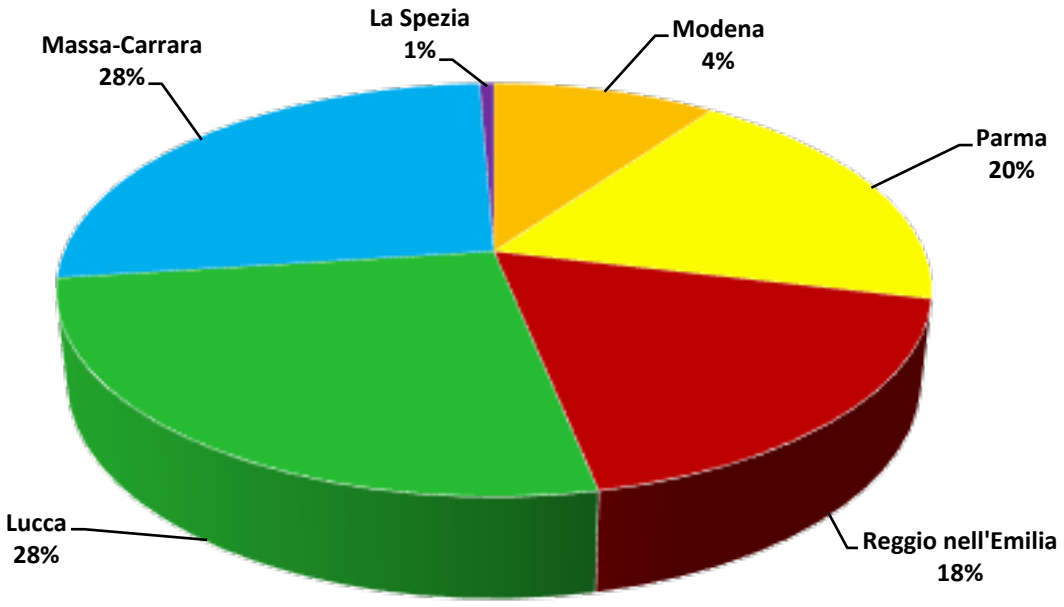
The Reserve includes important Apennine winter tourist resorts in the Modena, Reggio and Parma areas: alpine skiing is mainly practiced in the Cimone area, in S. Annapelago, in Cerreto Laghi, Ventasso Laghi, and Febbio - Alpe di Cusna, in Prato Spilla, Schia and at Zum Zeri; cross-country skiing centers are present in Piandelagotti, Piane di Mocogno (MO), Pratizzano and Pian Vallese (RE); Monte Cusna and the nearby Monte Prado are popular destinations for ski mountaineering enthusiasts.

On the Tuscan side, the Municipality of Castiglione di Garfagnana hosts the Casone di Profecchia tourist center equipped with a small ski lift, some cross-country ski rings and snowshoe trails that connect Casone di Profecchia with the Emilian side and the tourist resort of Piandelagotti. The centre of Cerreto Laghi, at the Cerreto Pass, crossroads between the regions of Tuscany, Liguria and Emilia-Romagna, can boast facilities for a diversified winter tourism offer including alpine skiing, cross-country skiing, snowshoeing, snow trails, and an ice rink and good restaurant and hotel services; the tour operators of Cerreto Laghi also participated in the European Eco-Cluster project (completed in 2014), for the good environmental management of homogeneous business districts.

The most important resources and facilities relating to winter sports and tourism for the Reserve are however concentrated in the Modena Apennines. Of strategic importance for alpine skiing is above all the ski area of Monte Cimone which offers over 50 km of slopes, all connected to each other. The skiing facilities are developed along the three sides of the mountain, between the municipalities of Sestola, Riolunato, Montecreto and Fanano. The area is the largest in the northern Apennines and has been managed for more than 20 years by the Monte Cimone Winter Station Consortium which comprises 24 lift systems that are constantly upgraded and featuring a maximum capacity of 22,000 people/hour. The area of the district includes, in addition to the numerous downhill slopes, 1 cross-country skiing ring (where you can also practice sleddog), 1 snow park and numerous trails for snowshoeing and ski mountaineering. Moreover, in the Modena area of the Reserve, there are also the S. Annapelago ski lifts (Pievepelago) and cross-country skiing centers such as the Piana Amorotti Cross-Country Center with 40km of slopes (Municipality of Lama Mocogno), the Cross-Country Center Boscoreale - Piandelagotti with 50km of slopes (Frassinoro area), as well as the cross-country stadium of S. Annapelago and the ring of Monte Cimone. As already mentioned, the Apennine winter tourism in the Province of Modena enjoys a relativbely better condition, also due to the big snowfall recorded in recent winter seasons, with the exception of the very last ones. Data from Studies and Statistics Center of the Chamber of Commerce of Modena even indicate for December 2017 an overall tourist increase of 76.6% in the Apennine area (with presences concentrated



- *Figure 15.4 - Number of agriturisms for each municipality of the Biosphere reserve and of the enlargement proposal. The colour refers to the Provinces; data collected for the Ventasso Municipality derive from the sum of the existing Municipalities of Busana, Ligonchio, Collagna and Ramiseto.*



- *Figure 15.5 - The percentage distribution of agriturisms in the territories of the 5 Provinces affected by the Biosphere Reserve and by the enlargement proposal.*

mainly in the Monte Cimone area); the same data show that this record increase does not, however, change the annual tourism trends.

As far as winter tourism in the Reserve is concerned, the Neve Natura e Cultura d'Appennino Project (Snow Nature and Culture of the Apennines) promoted by the Tuscan-Emilian Apennine National Park is highly significant. Since 2007, students from the cities are brought into contact with the environment, population and traditions of the Apennines, allowing them to live an intense physical and educational experience, full of emotions and experiences, in which theoretical and practical notions are learned and a different form of winter tourism is being promoted.

AGRITOURISM

Agritourism is by now well developed in the Biosphere Reserve, especially in Tuscany, but it is also growing on the northern side of the Reserve and can currently count about 293 facilities distributed over its territory. These facilities offer both accommodation and catering services and sometimes the chance to participate in environmental education activities and sustainable production.

Figure 15.4 shows the number of agriturisms present in each of the municipalities of the territory of the Biosphere Reserve and of the territory nominated for enlargement.

Figure 15.5 shows the percentage of agriturisms present in the territories of the 6 Provinces.

ECOTURISM

A form of ecotourism developed in the territories of the MaB area, with a particular focus on the social and environmental responsibility. This was made possible thanks to the presence of numerous Protected Areas and thanks to the numerous guides (Nature and Walking Guides (GAE), Alpine Guides, Tourist guides, etc.) who accompany tourists into and around said Protected Areas.

Nature and walking tour guides (GAE) have a relevant role in the area. As a matter of fact, they explain the environmental and naturalistic aspects of the territory to individuals or groups, guiding the visitors through mountain and hill environments, and even to man-made environments, including parks and protected areas, as well as exhibition facilities concerning nature and ecology. On foot, on horseback, by mountain bike or with snowshoes, an excursion with a professional nature and walking tour guide adds value, expertise and safety to this experience.

The waterways of the Reserve, in particular those of the Garfagnana area, are suitable for the practice of sport fishing and canyoning due to the frequent and abundant rains of the Apennines. The waters of streams and brooks, cold and full of oxygen, represent the ideal habitat for numerous fish species. The management of fish fauna and sport fishing is carried out in collaboration with local fishing clubs, as is the management of the downstream hatcheries in order to get local species back, such as the brown trout and the Arctic char. The area waterways are also chosen for other sporting activities with a tourist value such as Canyoning, rather practised in particular along the Enza stream, on the border between the provinces of Parma and Reggio nell'Emilia.

MUSHROOMS, CHESTNUTS, BILBERRIES

In the Biosphere Reserve, the collection of mushrooms and chestnuts is an important tourist attraction due to the activities and events connected to them (festivals, tastings ...) which take place in Autumn on both sides of the Apennine ridge. These activities have been enhanced through various initiatives including the "Autunno d'Appennino" ("Autumn of the Apennines") project developed by the Tuscan-Emilian Apennine National Park, in synergy with other local authorities (Municipalities, Unione Montana dell'Appennino Reggiano – Mountain Union of Municipalities of Reggio Emilia Appenines, Antico Frignano and Appennino Reggiano LAG, Province of Parma). The project implements a shared strategy for the promotion of environmental education paths, naturalistic, innovative and off-season tourism, the recovery of biodiversity at risk (the chestnut groves) and the cultural-identity recovery of the villages. Another initiative linked to the conservation of chestnut groves is "dolce & farina" a gastronomic contest aimed at enhancing the production of chestnut flour with the traditional method.

The area of the Tuscan-Emilian Apennines is a renowned destination for mushroom picking that is regulated throughout the Reserve. In particular, the Municipality of Pontremoli is included in the PGI porcino mushroom area. An important event linked to mushroom picking, that has seen rapid development in recent years, is the Cerreto Laghi World Mushroom Championship. The event dedicated to porcini was born from an idea of "Frà Ranaldo" by the National Park of the Tuscan-Emilian Apennines and the cooperative "I Briganti di Cerreto", in collaboration with the associations "Passione Funghi e Tartufi" and "A Passeggio nel Bosco". It reached its seventh edition in 2020 with hundreds of registered participants. The World Mushroom Championship is also an opportunity to commit for the environment, in fact there is great attention to environmental issues, testified by the spirit of the initiative and by paricipants' compulsory attendance to the evening training session on Saturday, focussing on good practices for an environmentally friendly mushroom hunting and picking with precise indications for the competition. Furthermore, at the time of registration, participants can choose whether to take part into in the traditional competition or in the "Combinata Apenninica" combined competition. The participants of this special category, at the start, in addition to the kit for the picking of mushrooms, will be given a biodegradable plastic bag in which to collect waste found while picking mushrooms.

Still in the field of tourism related to the "mushrooms", it should be noted that since 2018, it is possible to buy online mushroom picking permits for the territories of the Reserve both on the Emilia side and on the Tuscan side. All this is done directly through the website www.geoticket.it which represents the portal of a project at a national level; with the purchase of permits, users also receive regional mushroom picking regulations

The Modena territory within the Biosphere Reserve allows to expand the tourist offer linked to forest products with the non-marginal economy of blueberry picking. The black bilberry (Vaccinium myrtillus L.) of the Modena Apennines is a spontaneous product that grows in an area between the Municipalities of the Parco del Frignano and nearby Municipalities in the neighboring provinces (Reggio Emilia, Bologna, Lucca and Pistoia), in the bilberry moorlands that can be found at an altitude between about 900-1800 a.s.l..

The picking and processing of this excellent product, appreciated by both consumers and the pharmaceutical industry, are protected by the "Tradition and Flavors of Modena" label of the Modena Chamber of Commerce which, in collaboration with pickers and producers, has drawn up a dedicated specification; the label stems from a collaboration between the Antico Frignano and the Reggio Emilia Apennines LAGs, the Park of Alto Appennino Modenese (now Parco del Frignano) and the Union of Municipalities of Frignano.

The bilberry picking is regulated by the Management Body for Parks and Biodiversity of Central Emilia. The regulation provides for: picking within the limit of 1 kg for everyone and up to 5 kg for residents in the Municipalities of the Parco del Frignano (Fanano, Fiumalbo, Frassinoro, Montecreto, Pievepelago, Riolunato and Sestola); "one-off" daily authorization for residents, costing 10 euros, for picking up to 20 kg for self-consumption; for people registered with the specific "Pickers Register" seasonal collection is possible up to 100 kg per day; permit issued at a cost of € 100 for students, unemployed people and pensioners (submitting a tax return income of maximum € 10,633), and at a cost of € 120 for farmers and businesses specializing in the agricultural sector and € 300 for all other categories; picking prohibition in Zone A and A1 of the Park.

COMMUNITY RESPONSIBLE TOURISM

Community Responsible Tourism is a new form of tourist reception which developed in the Apennines, providing a great opportunity for future sustainable development. It addresses those tourists who are attracted by the authenticity of the places, the genuineness of human relations and the singularity of the culture and local traditions. These tourists are looking for a closer connection with the territory they are visiting. This form of tourist reception lies in the participation of all those people, inhabitants of a village or valley, who are willing to improve and enrich the reception and hospitality of their territory. They can do this by offering experience, expertise and practical knowledge of the real local culture: old trades, traditions, typical food, local quality products and traditional handicraft. Within the territory of the Biosphere Reserve some significant Community Responsible Tourism projects have been developed among which the Briganti del Cerreto (a cooperative located in Cerreto Alpi, one of the first to launch a successful pilot project regarding community tourism) and by the Valle dei Cavalieri community cooperative in the Alpe di Succiso area. The latter represents a study model at an international and academic level as an example to keep small villages and mountain communities alive. Another community cooperative was born in 2020 in the village of Rigoso in the Municipality of Monchio delle Corti. On the Tuscan side, projects managed by Community Cooperatives have also been launched which are defined and regulated by the recent Tuscan Regional Law LR 67/19; in the territory of the Reserve there are projects in the Municipalities of Zeri, Pontremoli, Fivizzano, Filattiera, Mulazzo and the latter two are particularly involved in the process of development of this new form of responsible tourism.

SPORT TOURISM

Within the UNESCO MaB Biosphere Reserve, it is possible to practice sport tourism activities thanks to the presence of suitable natural or equipped areas:

- Climbing. The Pietra di Bismantova, located in the medium-altitude Reggio Emilia Apennines, offers various exciting long routes and can be considered the most interesting and complete “outdoor climbing gym” in the entire Emilia-Romagna region. The climb to the summit plateau is rewarded on arrival by an unforgettable view of the Apennine chain. Bouldering and sport climbing can be practised all year round. Furthermore, in the Dolo Valley there are several possibilities with equipped via ferratas.
- Cycling tourism. The Appennino Tosco-Emiliano area boasts an ideal territory both for practising cycling tourism on the road (with a large number of minor roads which are little or almost not concerned by motor traffic and therefore ideal for bikes) and mountain biking (which can count on an extensive network of forest roads). Numerous itineraries with various levels of difficulty meander through the area, thus making of the territory of the Biosphere reserve an important reference point for road cycling and mountain bike lovers. The Park Authorities in the area have proved to be very sensitive to this form of sustainable tourism: the Appennino Tosco-Emiliano National Park has developed the “Bike Park” project in which 26 routes have been identified, for a total of 1300 km to be covered also through the use of pedal-assist electric bicycles owned by the Park; in the Modena area

there is the cycle route Ciclovia del Parco dei Sassi di Roccamalatina and the cycle route Ciclovia del Secchia, moreover the territory of Frignano is well known among mountain bike lovers; in the Parma area, the synergy between the Mountain Union Appennino Parma Est, the Appennino Tosco-Emiliano National Park, the Cento Laghi Regional Park (Parchi del Ducato) and the Municipalities of Calestano, Corniglio, Langhirano, Lesignano de 'Bagni, Monchio delle Corti , Neviano degli Arduini, Palanzano and Tizzano Val Parma (all included in the Reserve) produced a unitary cycling project known as the "Grande Giro MTB" (MTB Great Tour) structured as a MTB track in stages, with variants and different access-starting possibilities. An important reference for cycling in the Reserve is the area of Monte Cimone which in recent years has become a reference point for mountain-bike, free ride and downhill enthusiasts: the "Cimone Bike Park", which includes 70 km of routes dedicated to free ride, enduro and downhill, can also be found in the area and is managed by the Valli del Cimone Consortium; the 284 km of the itineraries of "Cimone in MTB", for example, wind through the municipalities of Fanano, Montecreto, Riolunato and Sestola. The #APPENNINOBIKETOUR project is also significant for the area, which promotes the establishment of the CicloVia Appenninica (the Apennines Cycle Route) which from the summer of 2018 has been the object of an evaluation procedure for inclusion within the network of the National Tourist Cycle-Routes: the path through some of its stages (stages 5-6-7-8) would cross a considerable number of Municipalities of the Biosphere Reserve in the Parma area (Corniglio, Berceto, Monchio delle Corti, Palanzano), in the Reggio area (Ventasso, Villa Minozzo, Castelnovo ne 'Monti , Toano, Carpineti, Baiso) and in the Modena area (Palagano, Polinago, Lama Mocogno, Montese). Finally, it should be emphasized that the current network

■ *Figure 15.6 Cycling tourist on the Biosphere reserve trails..*

of cycle paths and MTB tracks already provides a "slow" ecotourism connection between the ridge municipalities and the city of Parma, along a fundamental axis for the development of the Biosphere Reserve territory.

- Adventure Parks. The Adventure Parks offer a series of rope courses, with passages, handholds and ropes which exploit the natural support of trees or a platform system made up of walkways, nets and Tibetan and Tyrolean bridges. These theme parks

have a very low environmental impact and offer a safe, recreational sport attraction in close contact with nature. These rope courses stimulate people's coordination, balance, concentration and, to some extent, physical fitness. In this territory, on both sides, 8 different adventure parks can be found, among which the Cerwood Adventure Park -the greatest park of Italy and the first park in the Emilia-Romagna region- where the "Dedalus" project was launched, an educational workshop to experience the Apennine nature which was born from an agreement with the National Park.

- One of the key projects proactively involving the local councils of the cities and the largest hamlets at the foot of the hills is the soft connection between urban areas and rural areas created through buffer areas that involve natural elements such as rivers, agricultural areas, cycle paths, historical routes, etc. In particular, the projects for the construction of cycle paths along the river routes starting from the cities of Parma and Reggio Emilia constitute a cornerstone of the strategy of access to the territories of the reserve by the populations of the large towns located along the Via Emilia.

CULTURAL TOURISM

Cultural tourism, associated with the historically important sites located throughout the Tuscan-Emilian Apennine territory is also highly developing:

- Canossa Sites. Matilda of Canossa's lands, between Canossa and Frassinoro, characterised by the outlines of castles and by the presence of ancient parish churches, tower houses (84 just in the Municipality of Carpineti) and historical villages, represent a vast area of the territory where the medieval civilisation is still manifest. The fortified lines (particularly visible in the Reggio Emilia Apennines) followed one upon another from West to East, along different altitude levels. Many castles of Canossa were destroyed by the free Communes of the time and during the fights among seigniories. In part, the old castles have been converted into palaces and civil residences. Nevertheless, the castles of Canossa network is still visible on the territory and represents an important tourist and cultural attraction. The castles are accessible by car but it is possible to go through the area on foot, by bike and on horseback, thanks to the marked and georeferenced Route of Matilde di Canossa.
- Castles of the Modena Apennines: In the late Middle Ages there was continuous disputes over the territories between different seigniories that erected many castles of which there are numerous widespread vestiges and which stand out for their conservation and beauty. These are the castles distributed in the easternmost portion of the Reserve (for example: Montecuccolo Castle, Rocca di Montese, Torre di Guiglia).
- Lunigiana Castles. In the Middle Ages the castles in the Lunigiana lands were the background for battles and events regarding the great seigneurial families, such as the Malaspina. These families alternated and followed one after the other in the domination of feudal estates. Still more than 100 today, the castles are the most important guardians of the history and traditions of an entire territory. The Municipality of Pontremoli is home to one of the most important medieval castles in Lunigiana, the Piagnaro Castle, which owes its name to the "piagne", sandstone slabs typically used in local housing architecture; the castle, as well as the city of Pontremoli, represented a fundamental stop along the Via Francigena, and they are

mentioned in Archbishop Sigeric's itinerary. Also, in Aulla it is possible to admire and visit an imposing Renaissance fortification, the Brunella fortress which takes its name from the particular color of the rock on which it stands, at the confluence of the Magra river and the Aulella torrent.

- Garfagnana Fortresses. History left a deep mark on Garfagnana, an area disputed between Lucca, Pisa, Florence, Genoa and the Estensi family states because of its borderland strategic position. This is shown today by the presence of fortresses, castles and fortified villages, perfectly integrated in the typically rural landscape of this area. The settlements, which developed mainly on the floodplains, were specially built with defence and attack purposes. Today, having lost their military and defensive functions, they remain "alert" on the highest hills where they attract tourist, cultural and study activities. The most important ones are the Montalfonso Fortress in a dominant position over the village of Castelnuovo di Garfagnana and the imposing Verrucole Fortress in San Romano, and the Castle of Castiglione, which stands in a fortified village with almost intact walls, a fortress and splendid towers that controlled access to the Apennine ridge along the Via Vandelli.

- The Gothic Line and the Italian Resistance. Numerous museums trace this crucial moment in the history of Italy which left an indelible mark on the territories of the Biosphere Reserve. During the Second World War, particularly after September 1943, the area became a refuge for the partisan forces who withdrew along the Apennine ridge. The area was located within the famous Gothic Line, on which the German army settled in 1944 by implementing a tactic of "hard retreat". Some Apennine municipalities were the scene of violent reprisals by fascists and German forces and some events are sadly known, including the Monchio massacre. In addition to the museums of the Resistance of Fosdinovo and Neviano we also remember the Diffuse Museum of the Gothic Line of Montese and the Museum of the Republic of Montefiorino and of the Italian Resistance (Montefiorino). In fact, in Montefiorino the partisan forces managed to free themselves from the fascist garrisons in the summer of 1944 and establish the legendary small Republic of Montefiorino which had time to give itself some rules before being crushed by the German roundup at the beginning of August, to then restore partisan control in the winter of 1944-45.

- Ethnographic and mountain-peasant culture and tradition museums. There are numerous museums scattered throughout the territory both in the Emilian and Tuscan municipalities that allow full immersion into the traditions of the past and keep the traditions of local folklore alive. These include the Chestnut and Borlengo Museum at S. Giacomo in the Municipality of Zocca, an area known for the cultivation of important products such as Marrone di Zocca and Marrone del Frignano (varieties of chestnuts certified with the "Traditions and flavors of Modena" Label by the Chamber of Commerce of Modena); the museum has thematic rooms dedicated to old tools for harvesting and processing chestnuts, household objects for the conservation of flour, Borlengo (typical peasant's dish, similar to a crêpe with a mixture of water, flour, salt, oil, and eggs) and offers numerous educational workshops for families and schools.

- Museo delle Statue Stele Lunigianesi (Museum of Lunigiana Stele Statues) "A.C. Ambrosi". These are very important testimonies of prehistoric and protohistoric civilizations that have affected the area of Lunigiana since the third millennium BC. until about the 6th century BC. The 80 stele statues in

the museum represent male and female figures in a stylized manner accompanied by armaments or jewelry and very rare inscriptions. The above mentioned Piagnaro Castle (Pontremoli) is home to the Museo delle Statue Stele

- "Lands of Poets". Lunigiana and Garfagnana in particular were lands of passage of important personalities of Italian culture such as the "supreme poet" Dante, whose house-museum has been preserved in the Municipality of Mulazzo, and Giovanni Pascoli who lived in the hamlet of Castelvecchio Pascoli, in Barga, where there is now a house-museum. In Casarola, Val Bratica, in the Municipality of Monchio delle Corti, can be found the house of Attilio Bertolucci, one of the greatest poets of the 1900s, and in the same house lived his sons Bernardo and Giuseppe, famous international film directors. Attilio, through his poetry, and his sons Bernardo and Giuseppe, through their cinematographic works, have told a lot about the land included in the Reserve
- Events. In the frame of cultural tourism offer, we cannot overlook the presence of the Fanano Stone Sculpture Museum, linked to the "Fanano Symposium", a cultural event established back in 1983 which is still held today. As for the artistic and cultural events, it should be noted that the town of Fiumalbo back in the period between 1967-68 hosted "Parole sui muri" ("Words on the walls"), an international exhibition of posters that had a strong appeal at the time.
- Petroleum Museum Park: Vallezza is a small village in the Municipality of Fornovo di Taro (Parma). Crossing the town and its valleys today, it is difficult to understand the importance of this place in the history of hydrocarbon extraction in the late 19th century until the seventies. Its landscape, as it appears today, tells us a few but very important details of the history of oil exploration in Val Taro, but also throughout Italy. From the "demonic" sources of "stone oil" that polluted the cultivated fields, to the first research campaigns for industrial purposes in the second half of the nineteenth century, up to the construction of the Italian Petroleum Company, an extremely important industry for the local economy, from 1905 until the end of the seventies. Retracing history by recalling the value of the landscape around Vallezza has the broader meaning of understanding how the role of oil influenced the Italian economy in the first half of the 20th century and how the Vallezza oil field is a necessary testimony in order not to disperse that heritage of techniques, knowledge and memories belonging to an industrial production of the past.
- National Archaeological Museum of Luni: it exhibits what has emerged from the archaeological excavations that have brought to light the ancient Roman colony of "Portus Lunae", founded in 177 BC. along the Via Aurelia, destined to become a strategic port on the Ligurian Sea. The most renowned finds of the archaeological site, protected by MiBACT, are the "domus of the mosaics", the "domus of the frescoes" and the splendid amphitheater of the imperial age.

WINE AND FOOD TOURISM

The Tuscan-Emilian Apennine area promotes various activities with the aim of protecting the typical local productions and enhancing traditions.

- *Menù a Km Zero* (Zero Mile Menu) Contest. The Tuscan-Emilian Apennine area boasts an extraordinary wealth of high-quality agricultural and

food products and a great wine and food culture. Since 2008, the National Park has organized the "Appennino Gastronomico - Menu a Km zero" (Food and Wine in the Apennines – Zero Mile Menu) contest offering a taste tour within the Park in order to discover these excellent products and their connection with the production zones, therefore recovering and qualifying the Apennine agricultural and food characteristics, by proposing menus made with local (Zero Mile) and seasonal products; The competition could rely from the beginning on a close collaboration with ALMA, the International School of Italian Cuisine founded by Gualtiero Marchesi (chef of international fame) and based in Colorno (PR). ALMA plays the role of technical jury in the competition alongside a popular jury. The competition rapidly evolved in parallel with the designation of the Appennino Tosco-Emiliano Biosphere Reserve: between 2014 and 2015, thanks to the contribution of local LAGs, the competition then turned into a network of Apennine restaurants offering "zero mile" menus all year round and the project, which initially concerned only the Municipalities of the National Park, was extended to the entire Biosphere Reserve resulting in the current project "UPVIVIUM - Zero Mile Gastronomic Biosphere" (www.upvivium.it); following the UNESCO MaB International Conference at Torrechiara Castle (Langhirano, Parma) in 2016 dedicated to the "Branding of Biosphere Reserves Through High Quality Products and Gastronomy", the project was extended to the Biosphere Reserve of the Ledrensi and Judicaria Alps and to the Reserve of the Po Delta (2017/18) and then also to the Sila and the Tuscan Islands Biosphere Reserves (2018/19). The project is a successful testimony of the ability to network between the Biosphere Reserves and it has therefore obtained an accreditation from the UNESCO MaB National Technical Committee.

- ***Strade dei Vini e dei Sapori*** (Wine and Flavour Routes). The territory of the Biosphere Reserve is historically rich in high-quality food products, which have helped to spread an excellent wine and food culture. Wine and Flavour Routes were created in order to allow visitors to taste and try these excellent products. They include an integrated system of tourist offers located along an itinerary, characterised by places associated with wine and open to the public (vineyards, wineries, cellars) and related business activities (restaurants, hotels, agritourisms and wine bars). The area includes the following roads: the Road of the Prosciutto and Wines of Parma Hills (Parma), the Mushroom Road (Parma), the Road of Wines and Tastes of the Scandiano and Canossa Hills (Reggio Emilia), the High Apennines Road (Reggio Emilia), Wine Road of the Candia and Lunigiana Hills (Massa-Carrara).
- ***Paniere dei Parchi.*** (the Park hamper). It gathers and connects the agricultural and food products and the tourist services which express a close and rooted relation with their land of origin and which are, from a quality point of view, in line with the values of environmental protection pursued by the Parks and Protected Areas of the Emilian Apennines. Over 100 products and services are divided into categories and listed in an online catalogue, but the user can search for geographical areas using a geo-referenced map. Among the agricultural and food products included in the hamper there are: vinegars; jams, fruit juices, nectars and syrups; pickles, dressings and pasta sauces; bread, cakes and bakery products; medicinal herbs; cereal flours; bilberries from the Modena Apennines, raspberries, blackberries, currants, strawberries and other small fruits; honey; fruit, vegetables and garden products; PDO Parmigiano Reggiano cheese, pecorino (sheep's milk cheese), other types of cheese and yogurts; cold cuts, salami and pork products; the "Savurett" (a typical

pear compote) and the "Spongata di Corniglio" cake; meat cuts; various types of fresh pasta such as tortelli, tortellini, anolini and gnocchi; wines, liquors and distilled spirits.

- *I Musei del Cibo*. The Food Museums. The Parma area represents the food and wine tourism hub in the Reserve, both for the large number of traditional and quality products and for the strong appeal of its capital, Parma, which in 2015 was recognized as a Creative City of Gastronomy by UNESCO. In this context, the circuit of the Food Museums was born, which aim to enhance the individual quality products of the territory, telling and enhancing the places of production and the local culture. Inside the Biosphere Reserve there are the following museums of the circuit: Prosciutto di Parma Museum (Langhirano), Pasta Museum (Collecchio), Tomato Museum (Collecchio), Wine Museum (Sala Baganza), Salame di Felino Museum (Felino).

GARFAGNANA AND LUNIGIANA

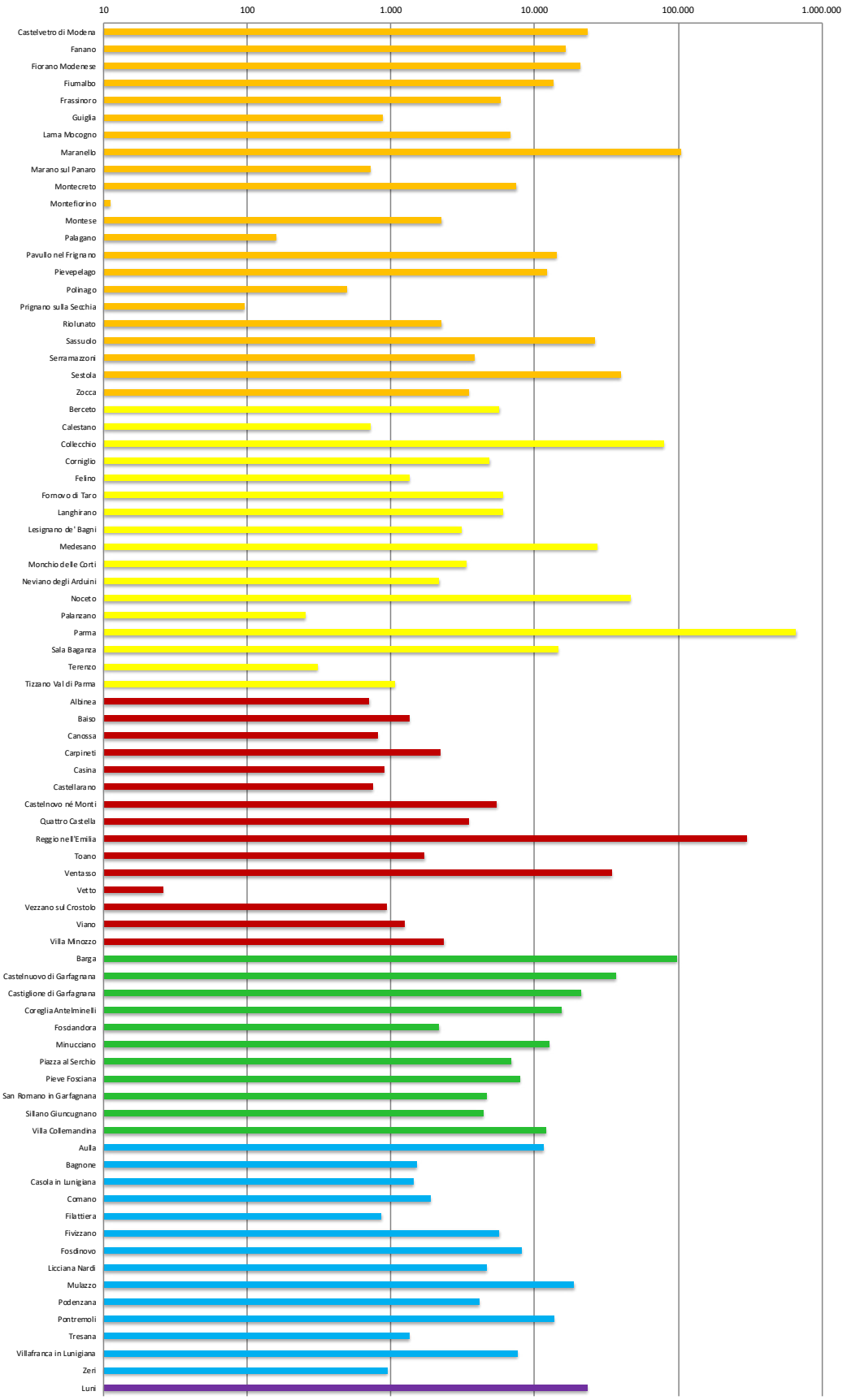
Garfagnana and Lunigiana are characterised by typical, well-known activities and facilities which attract many tourists ((Museum of Stele statues, perfectly preserved medieval castles and churches, rural areas rich in villages, typical activities and products, hermitages, as well as lakes and caves). Two important tourist sites are:

- Aulla-Lucca Railway. The Aulla-Lucca railway, between the parks of the Apuan Alps and the Apennines, links the valley of Lunigiana and Garfagnana and connects the rural villages of the two valleys with the neighbouring urban areas, through bridges, tunnels and striking landscapes. Today this historical sustainable route is an attraction for tourists too. More and more foreigners, English, Germans, Americans and Australians, but also many Italians, decide to enter the Apennine and Apuan parks by means of this railway.
- Equi Spa. The spa is located at the edges of the MaB Biosphere Reserve, but for centuries the rainwaters of the Equi Spa area (Fivizzano) have been collected by the impressive Apuan Alps, filtered by the subsoil, enriched with mineral salts, precious for your health, and then driven back to the surface where, not far from the medieval village, the waters are collected and exploited. The marble heart of the Apuan Alps gives birth to the healing waters which have been used in this spa for centuries.

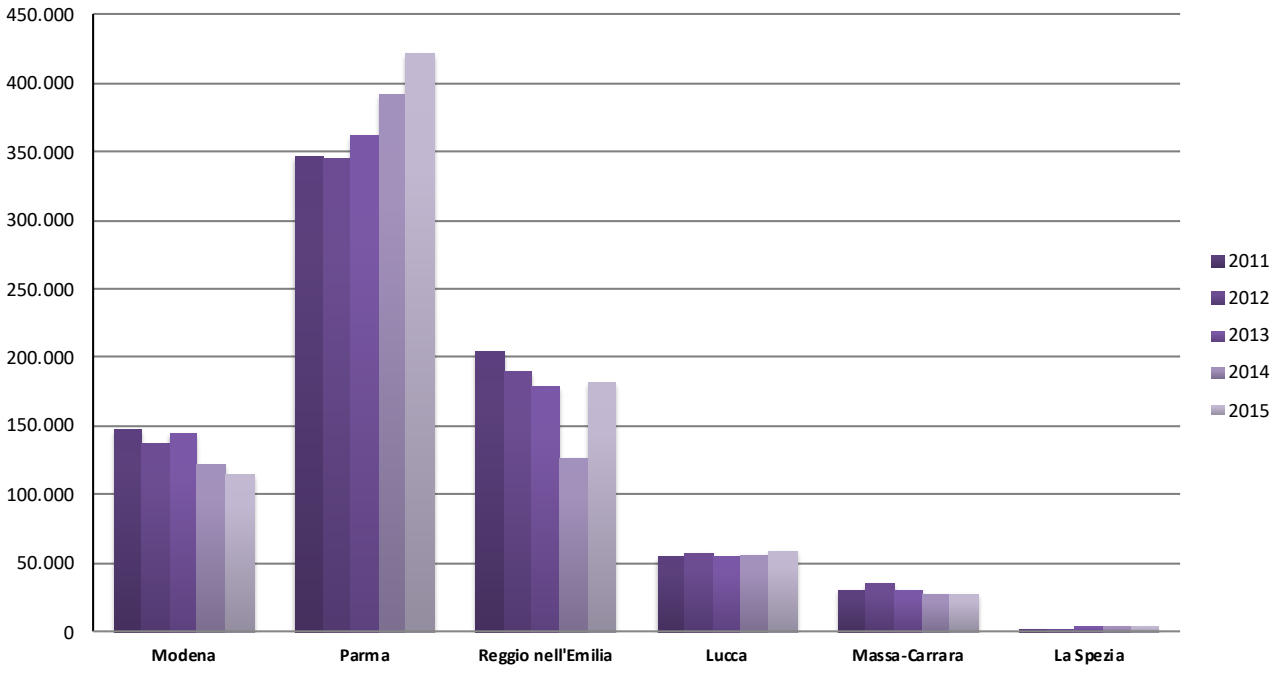
HOW MANY VISITORS COME TO THE PROPOSED BIOSPHERE RESERVE EACH YEAR?. IS THERE AN UPWARD OR DOWNWARD TREND, OR A PARTICULAR TARGET?

Tourism is an important but not predominant activity in the area (see introduction under 15.2). The different trends and targets have been previously described under 15.2.1.

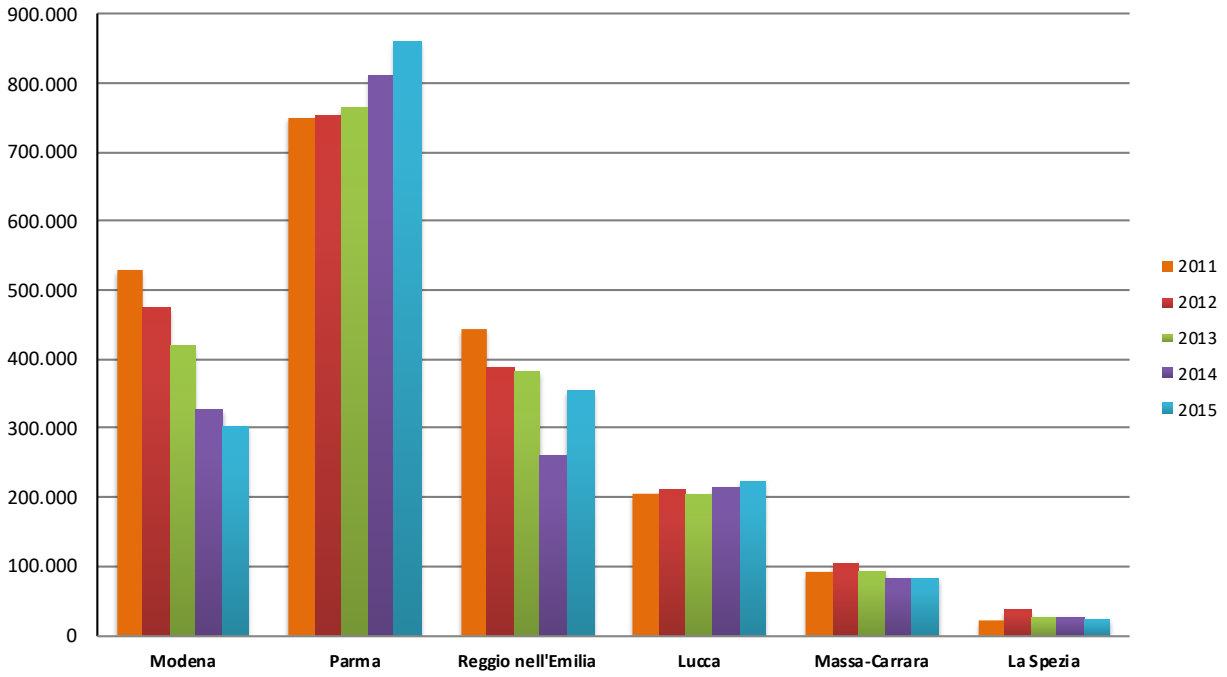
In the period from 2011 to 2015, on the whole territory of the 72 Municipalities of the Biosphere Reserve there were on average 687,979 arrivals per year (number of tourists who spent at least one night in the area) and 1,664,141 tourist presences per year (total number of nights spent by tourists in the area) with an average stay of 2.42 days. It can be inferred that the tourist presence



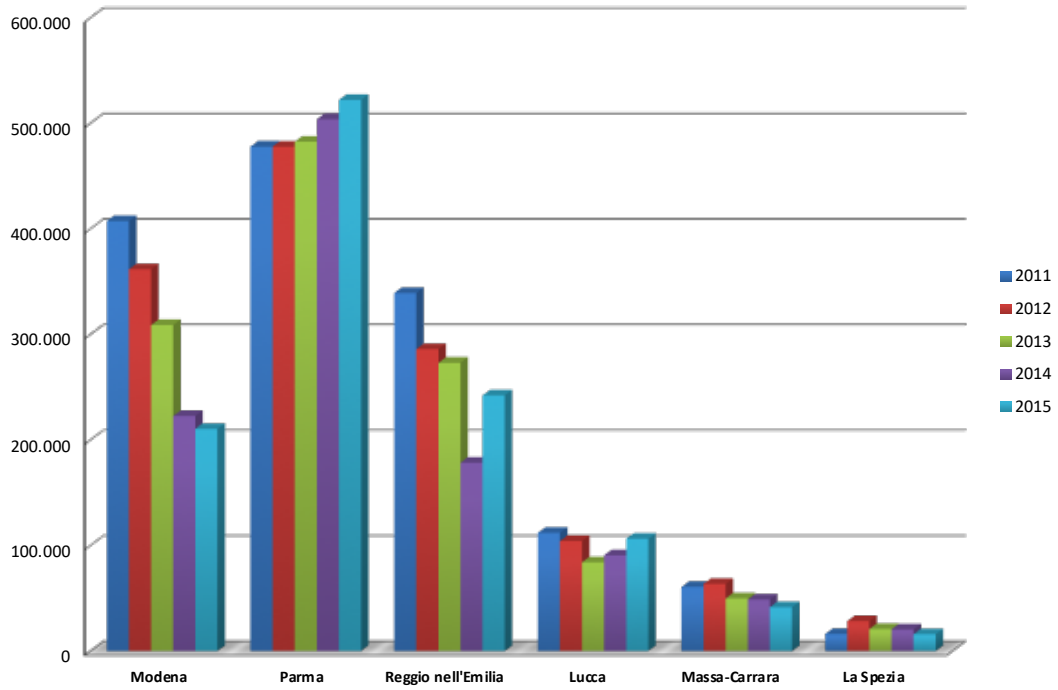
- *Figure 15.7 - Tourist presence in the municipalities of the Biosphere reserve and in the municipalities falling within the enlargement proposal; year 2015. The colours indicate the various provinces (blue – Lucca; green – Massa-Carrara; yellow/orange - Modena; yellow - Parma; red - Reggio Emilia).*



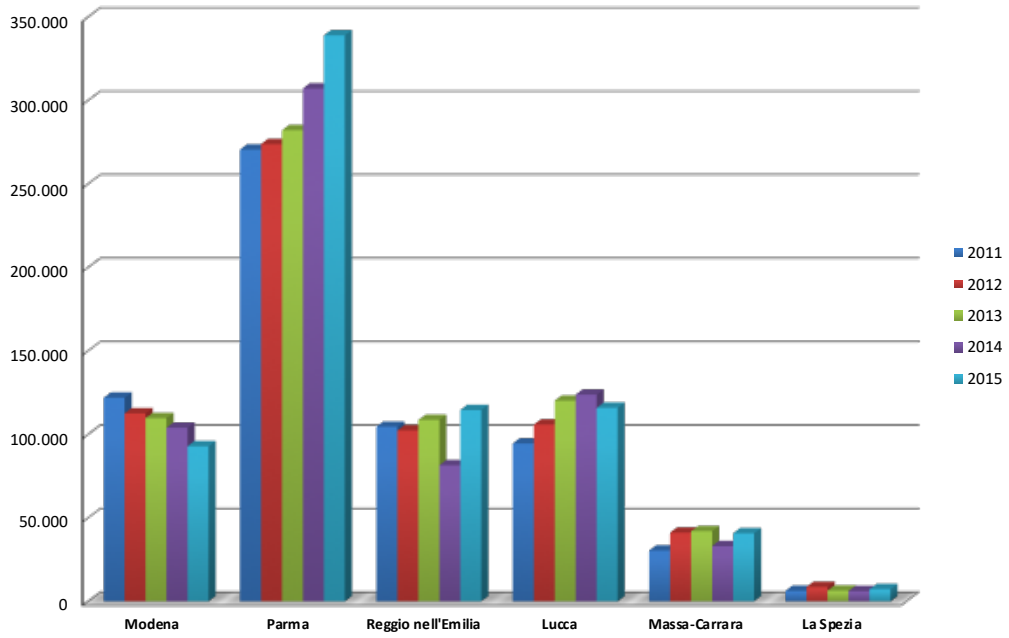
- *Figure 15.8 - Arrival time trend.*



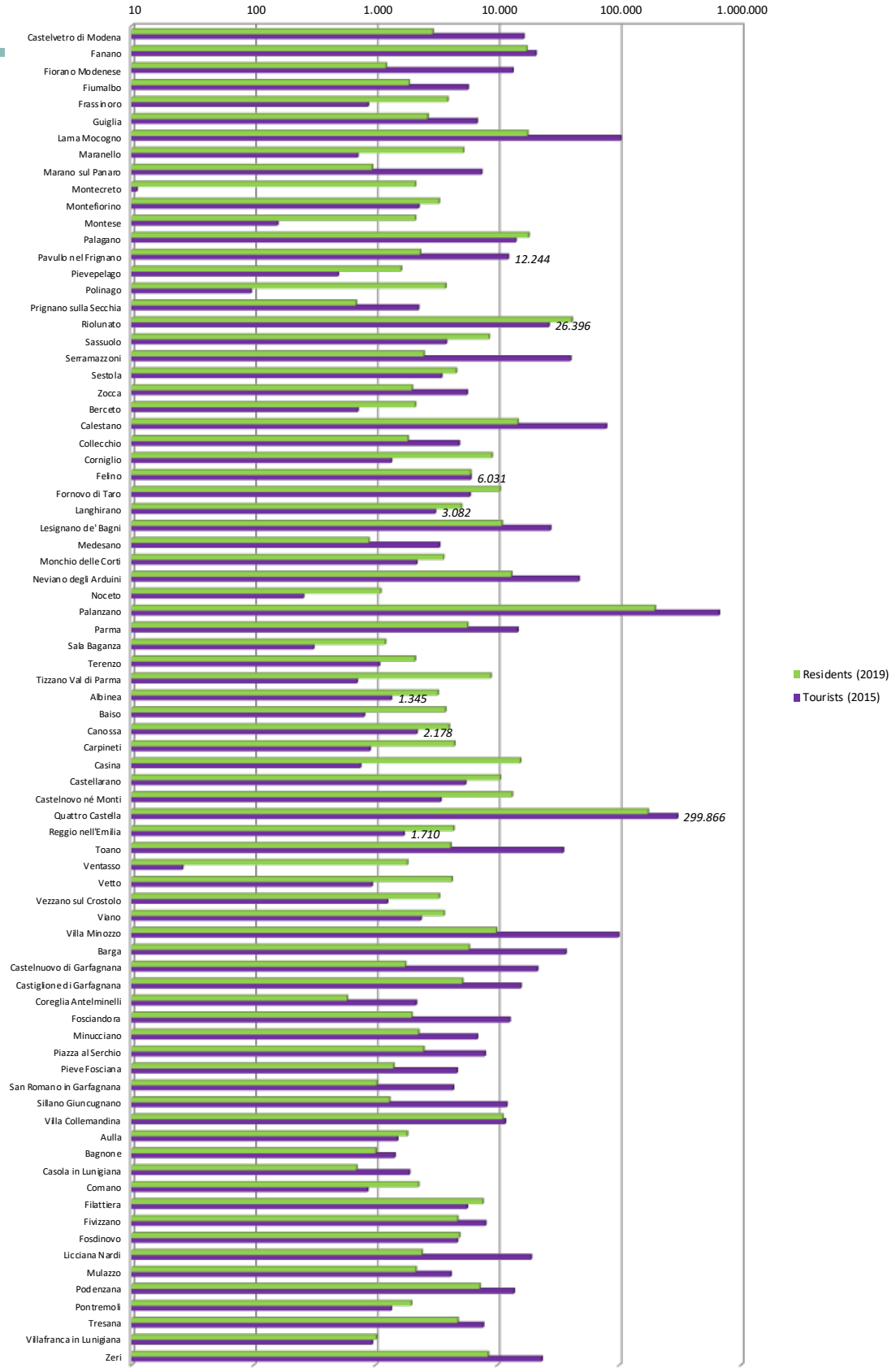
- *Figure 15.9 - Presence time trend.*



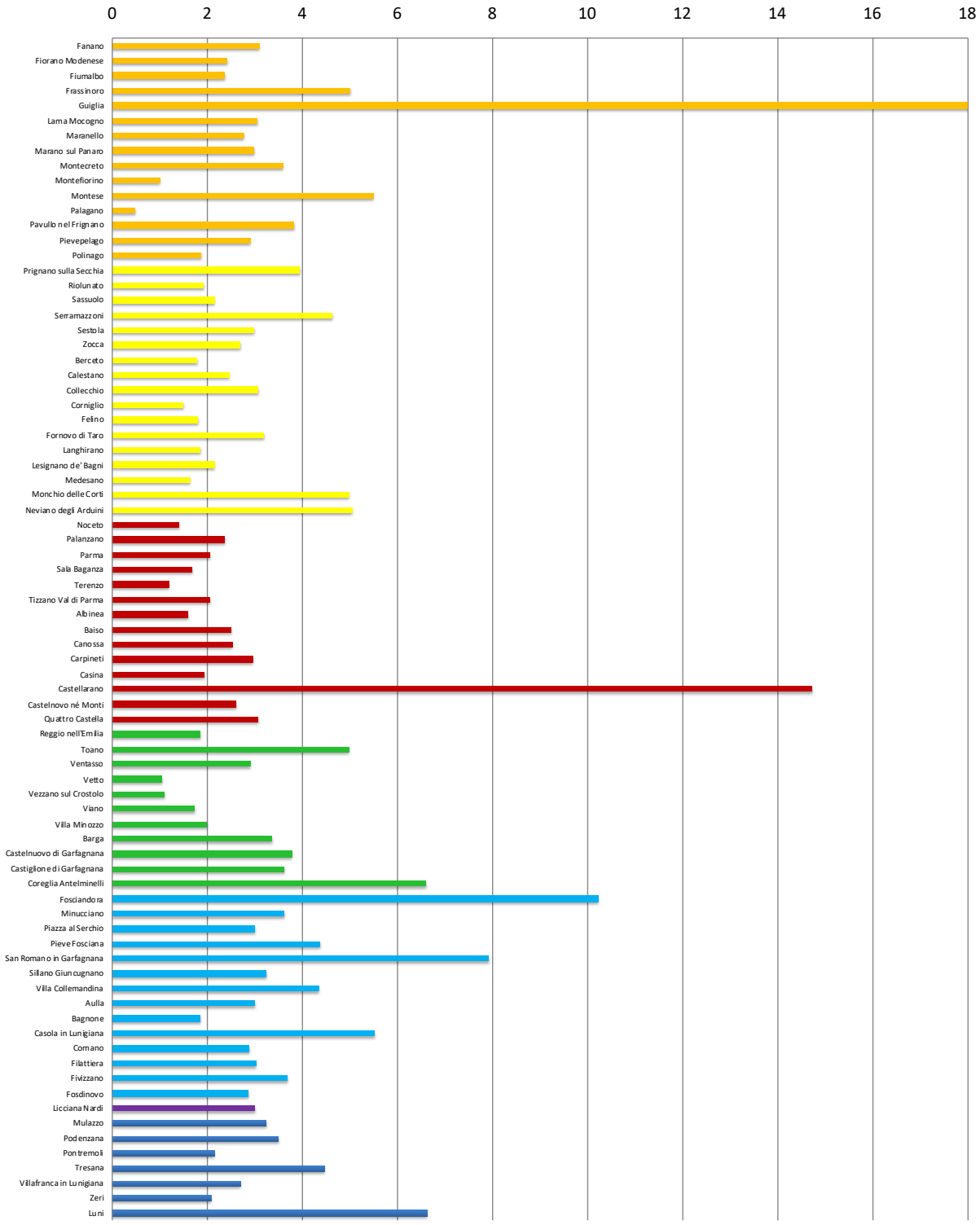
- *Figure 15.10 - Italian tourist presence trend*



- *Figure 15.11 - Foreign tourist presence trend.*



- *Figure 15.12 - Relation between the tourist presence in 2015 and the number of residents of each municipality of the Reserve and of the enlargement proposal area.*



- *Figure 15.13 - Days of tourists' average stay in the municipalities of the reserve and of the enlargement proposal area for 2015.*

corresponds to that of 4559 residents (total number of tourist presences / 365 days) a number not particularly significant in an area that has a total of about 661,112 residents. A "soft" tourism, with no negative impact on the territory and which could potentially grow in number and quality.

The graph on the previous page (Figure 15.7) shows the tourist presences for the year 2015 on each of the Municipalities of the Reserve (starting from 2015 it was not possible to find a complete data for all the Municipalities concerned).

Analyzing the trend over the years (the years 2011, 2012, 2013, 2014 and 2015 were taken into consideration), it can be observed that in the 6 reference provinces the tourist flow has remained almost constant in the provinces of Massa-Carrara, Lucca and La Spezia , it went down in the Provinces of Reggio nell'Emilia and Modena, and slightly up in the Province of Parma. The following graphs show the time trend of arrivals and presences.

The following graphs, on the other hand, analyze the situation of presences relating to Italian tourists and foreign tourists. In the Provinces of Modena, Reggio nell'Emilia and Parma the tourist presence is clearly unbalanced in favor of Italian tourists, by about one order of magnitude; on the contrary, in both the Province of Massa-Carrara and that of Lucca foreign tourists equalize in number with the Italian ones. In detail, from 2012 onwards, in the Province of Lucca the number of foreign visitors constantly and clearly exceeds (by at least 10,000 units) the number of Italian ones. More specifically, in some municipalities of Lucca the relationship is extremely unbalanced towards foreign tourism, for example (data referring to 2015): Barga with 35,994 Italian and 62,666 foreign visitors Coreglia Antelminelli with about 1260 Italian and 14,286 foreign visitors.

HOW ARE TOURISM ACTIVITIES CURRENTLY MANAGED?

Tourism activities in the Biosphere Reserve area are mainly run by family businesses and owners of agritourisms, hotels, restaurants and real estates (houses for rent)

There is a significant number of "returning" tourists (people and families originally from the local area who come back for their holidays and normally stay in properties owned by their families. There are also some bigger facilities such as campsites (27 facilities of which 13 in the Province of Modena, 6 in the Province of Reggio nell'Emilia), hostels (21 facilities of which 16 in Emilia-Romagna and 5 in Tuscany) and holiday homes run by small commercial companies, cooperatives, environmental associations and parishes. There is also a growing and increasingly popular network of alpine and hiking refuges (as many as 24 within the Municipalities of the Reserve, of which 9 in the Province of Reggio nell'Emilia) of public property or destined to civic or associations uses, usually entrusted to private individuals for management.

The ski resorts are run by businesses supported by public funding. Public bodies also own a number of establishments, which tend to be run by private managers. The three regions work in their respective territories to promote and support tourism activities with their own laws, initiatives and promotion bodies.

Groups of operators are starting to form in the territory, such as the Associazione Operatori Turistici della Lunigiana, Parco Appennino Turismo (Reggio Emilia) and Appennino Reale (between the Modena and Reggio Emilia Apennines). They are taking responsibility for organising promotion, development and training

initiatives, targeting the use of Web tools, the development and sale of environmental and/or cultural packages for tourists. Recently, individual professionals, aggregations and companies have increasingly started to be involved in activities such as tour leaders, guides and environmental educators, which are well promoted by all the Park Authorities present in the area and locally coordinated through organizational centers for Education to Sustainability (eg CEAS of the Central Emilia Parks, CEAS of the Reggio Emilia Network, CEAS of the Tuscan-Emilian Apennine National Park) . In the summer months in particular, entertainment activities are often organised by the local authorities in partnership with voluntary organisations and associations for the promotion of the surrounding area (the "Pro Loco" associations). They normally bring together tourists and residents of all of the settlements in the territory, even very small ones.

Furthermore, people from other countries (especially the UK and the Netherlands) buy abandoned properties and use them for holiday homes in a form of "semi-permanent international tourism" This phenomenon is mostly concentrated in the provinces of Lucca and Massa-Carrara.

The National Park together with the other Park Authorities present on the territory have worked effectively on schemes for an off-season tourism in the area. They innovated and expanded both methods and locations of traditional winter tourism (with initiatives such as "Neve Natura", snowshoeing and snow trails) on the northern side of the mountains, they did the same to increase autumn visits (with projects such as "Autunno d'Appennino), and summer visits (with projects like Alta Via dei Parchi and Gande Ippovia dell'Appennino) and they tried to turn into tourism and culture (e.g. the foliage) the traditional identity-based and folklore events, including the numerous chestnut and mushroom picking festivals. They have also started a project ("Parco Bike") to put together cycle tourism packages and routes (especially between Parma and Lucca).

Within the Reserve, some good practices of community management of tourism activities and related activities (Community Tourism) have also been consolidated.

It is to be highlighted that the Park Authorities operating within the Biosphere Reserve have a dense network of visitor centers (12 in the National Park of the Tuscan-Emilian Apennines, 9 in the Regional Parks of Central Emilia [3 in the Frignano Park, 3 in the Sassi di Roccamalatina Park, 3 associated with the Rupe di Campotrera Nature Reserve], 16 in the Parchi del Ducato Regional Parks [4 in the Cento Laghi Park, 5 in the Boschi di Carrega Park, 5 in the Taro River Park, 1 in the Natural Reserve Monte Prinzera, 1 in the wildlife center in the Provincial Park of Monte Fuso], 2 in the Natural Reserves of Lamarossa, Orecchiella and Pania di Corfino [visitor center and Birds of Prey Museum]) and facilities created, in agreement with hospitality management private operators or cooperatives, in selected strategic points of the territory, by providing them with adequate furniture and equipment, and interactive and multilingual tools for tourist and cultural information.

In terms of general Tourism management strategies, it should be noted that the Appennino Tosco-Emiliano National Park on 11 December 2014 has obtained recognition for the asdoption of the "European Charter for Sustainable Tourism" (ECST), which is a tool to safeguard and promote Protected Areas (currently undergoing a verification process targeting renewal). All protected areas that sign up to the Charter must implement a local strategy for development, planning, or tourism activities that guarantee long-term respect and preservation of natural, cultural and social

resources while making a fair and positive contribution to economic development and the achievement of the full potential of the people who live, work and stay in protected areas. In this sense, ECST is to be perceived as an important opportunity for identifying together with the stakeholders, even outside the boundaries of the protected area, new and effective forms of sustainable development of the territory and to improve its tourist attraction capacity. It should be noted that the Management Bodies for Parks and Biodiversity of Central Emilia and Western Emilia also began their path to achieve the ECST in April 2019.

A fundamental contribution for future strategies relating to sustainable tourism in the Reserve area comes from the Interreg Central Europe CEETO project (Central Europe Eco-Tourism: tools for nature protection) which involves 11 partners from 6 countries (Italy, Germany, Austria, Hungary, Slovenia, Croatia). The project, which began in 2017, aims to protect and enhance the natural heritage of protected areas, promoting an innovative model of sustainable tourism planning, inspired by the criteria contained in the ECTS and based on a participatory approach. The Protected Areas, Forests and Mountain Development Service of the Emilia-Romagna Region participates in the role of Lead Partner and 2 of the 8 pilot actions of the project will take place within the Biosphere Reserve: at the Tuscan-Emilian Apennine National Park , in the areas of Pietra di Bismantova and Lagdei; at the Alto Appennino Modenese Regional Park (now Frignano Park, part of the Central Emilia Parks), connected with two high-altitude lakes, namely Lago Santo Modenese and Lago Pratignano.

Much of the territory of the Biosphere Reserve currently benefits from funding programs for projects concerning sustainable tourism, in particular linked to the Local Development Strategies (LDS) of the LAGs of Emilia (Antico Frignano and Appennino Reggiano LAG; Ducato LAG) and to the Integrated Local Development Strategies (ILDS) of the Tuscan LAGs (Consorzio Lunigiana LAG; Montagna Appennino LAG). Looking at the Modena area, where the largest number of Municipalities affected by the proposed enlargement of the Reserve are concentrated, the Antico Frignano and Appennino Reggiano LAG has allocated almost 2.4 million euros in its Local Action Plan (LAP) 2014-2020 for action B1 "Qualification, reorientation, specialization and off-season transformation of the accommodation offer and tourist services"; of this sum, approximately 1.8 million euros have been allocated for the qualification and functional diversification of tourism companies, 300 thousand euros in tenders for the supply of goods and construction of public facilities to support trekking and hiking and 300 thousand euros for the pilot project called "An open-air gym" aimed at creating a new tourist product for the Modena and Reggio Apennines, also good for mid-seasons and targeting outdoor sports enthusiasts and active, sporting and naturalistic tourism.

INDICATE POSSIBLE POSITIVE AND/OR NEGATIVE IMPACTS OF TOURISM AT PRESENT OR FORESEEN AND HOW THEY WILL BE ASSESSED (LINKED TO SECTION 14)?

The territory of the Biosphere Reserve is characterized by reduced tourist flows that do not generate significant negative impacts on it. The positive impacts linked to the local development of ecotourism are significant. This development is partly derived from the spontaneous action of independent subjects but, above all, is linked to the actions implemented so far by the Park Authorities and in general by the management bodies of the Protected Areas which, with their projects, have been able to increasingly target

environmentally-friendly tourists with the local offer. These initiatives, which mainly focus on the knowledge of the territory in all its aspects and values, are favoring the seasonal adjustment of tourist flows (eg Atelier di Onda in Onda, Autumn of the Apennines, ...) and a better distribution of winter arrivals throughout the territory of the ridge (eg the Neve Natura project). The development of ecotourism has led to the birth of new businesses and in some cases to the start of activities supplementing the family income (B&B, farm holidays and agriturisms), which are crucial for the survival of small villages at risk of abandonment.

Negative impacts on the territory can be linked to winter tourism, and namely: to the anthropization of the territory deriving from the construction of a disordered building fabric (especially a legacy of the 60s / 70s / 80s) at some ski resorts on the northern side of the Apennines in the provinces of Parma, Reggio Emilia, and Massa Carrara, to the management of slopes and artificial snowmaking as well as, in a few Sundays a year, a significant presence of cars and buses. In most cases, since these are generally small tourist resorts, the relevant impact is not so high; this yet does not apply to the area of Mount Cimone, one of the main ski areas in the northern Apennines, which will therefore require adequate control and monitoring actions.

HOW WILL THESE IMPACTS BE MANAGED, AND BY WHOM?

The Appennino Tosco-Emiliano National Park, after obtaining the recognition of the European Charter for Sustainable Tourism in Protected Areas (ECST), now would like to extend its principles and objectives to the entire MaB Reserve area also through the synergy and collaboration with the managing bodies of the other Protected Areas. This means:

- To involve all those associated with tourism in and around the protected area in its development and management.
- To prepare and implement a sustainable tourism strategy and action plan for the protected area.
- To protect and enhance the area's natural and cultural heritage, for and through tourism.
- To provide all visitors with a high-quality experience in all aspects of their visit (through a holistic approach).
- To communicate effectively to visitors about the special qualities of the area.
- To encourage specific tourism products which enable discovery and understanding of the area.
- To increase knowledge of the protected area and sustainability issues amongst all those involved in tourism.
- To ensure that tourism supports and does not reduce the quality of life of local residents.
- To increase benefits from tourism to the local economy.
- To monitor and influence visitor flows to reduce negative impacts.

In order to extend the ECST principles throughout the Reserve area, it will be necessary to carry out a systematic campaign to raise awareness among the authorities, tourists and local people. The National Park will promote targeted learning initiatives to encourage the spread of good practices, including knowledge exchanges with other protected areas and territories that have significant experience in the field. It will support

Figure 15.14 – Permanent meadows at the foothill of Pietra di Bismantova.

ongoing communication initiatives with the specific aim of establishing a growing sustainability culture among tourists and residents.

In the dissemination of good practices, the activity of the National Park will find strong local support in the Management Bodies for Parks and Biodiversity of Central and Western Emilia (Parchi Emilia Centrale and Parchi del Ducato), which, as already pointed out, have recently started their own participatory process to also obtain the ECST.

15.3. AGRICULTURAL (INCLUDING GRAZING) AND OTHER ACTIVITIES (INCLUDING TRADITIONAL AND CUSTOMARY):

DESCRIBE THE TYPE OF AGRICULTURAL (INCLUDING GRAZING) AND OTHER ACTIVITIES, AREA CONCERNED AND PEOPLE INVOLVED (INCLUDING MEN AND WOMEN).

The agricultural sector is historically important for the hilly and mountainous territory of the Biosphere Reserve, not only for the enhancement of typical products, present in large numbers both on the Emilian and Tuscan-Ligurian slopes, but also for the irreplaceable role of safeguard and protection of the territory, of its knowledge, its integrity and stability and the natural and human resources present in it.

Data from the 6th Italian General Agriculture Census (2010) and the complementary tables published in 2012 identify woodland as the most common use of the agricultural land within the area chosen for the Reserve, followed closely by arable land, and permanent meadows and pastures.

The two Apennine slopes contribute in different ways to the composition of this complex agricultural framework. The Emilian slope provides the greatest numerical contribution, with a prevalence of the role of arable land over that of woodland areas which have recorded a strong increase in recent decades due to the abandonment of agro-forestry-pastoral activities even in areas that are not disadvantaged due to their acclivity or altitude. The Tuscan-Ligurian side instead has fewer woodland areas which, however, play a predominant role compared to other agricultural uses.

Permanent meadows and pastures also play an important role in the agricultural composition of the Reserve, mainly due to renewed interest in farming geared towards the production of high-quality produce. In the Emilian area, this type of agriculture is mainly centred on the rearing of dairy cows for the production of PDO Parmigiano Reggiano cheese. It is therefore possible to define this landscape as the "landscape of Parmigiano Reggiano", an emblematic scenery made up of pastures interspersed with woodland, guaranteed by the maintenance of the economy linked to this quality product.

Furthermore, the entire Biosphere Reserve is currently animated by renewed interest in the recovery and preservation of local animal breeds. On the Emilian slope, further to the rearing of Reggiana Red Cows, local breeds also include the Ventasso horses, the Cornigliese sheep and the Bianca Valpadana - Modenese cow breed. Other small-scale animal rearing activities on the Tuscan slope guarantee the conservation of local breeds of cow that are at risk of extinction, such as the Pontremolese and Garfagnina breeds, as well as traditional breeds of sheep such as the Massese (which are generally suited to the production of milk). This contributes to upholding biodiversity and local cultural traditions, which, in this area, are closely linked to rural life. The practices for the recovery and enhancement of local pig breeds are also important in the territory of the Reserve; a clear example of this is provided in the Parma area by the "Rosa dell'Angelo" biodiversity rural farm which raises breeds of free-range black pigs and offers guided tours to disseminate the farming method as well as to show the production of sausages.

In the Lunigiana area, the large amount of land given over to permanent meadows and pastures denotes the importance of livestock rearing (cows, sheep and

goats), traditionally oriented towards the production of milk. in hillside areas, wine production has historically played a key role in the agricultural economy, with vines stretching up until the altitudinal limit for growing grapes (550m above sea level), as testified by 4 PGI wines (Val Magra, Toscano, Costa Toscana, Liguria di Levante) and 1 PDO wine (Colli di Luni); beekeeping is also important as evidenced by the honey Miele della Lunigiana PDO (first Italian PDO product of its kind). In Lunigiana and Garfagnana, a limited agricultural area, but still significant in percentage, is destined to cultivating trees for wood, among which the chestnut tree dominates, which represents up to 94% of the crops

The entire area of the Reserve is affected by two widespread trends: a fall in the number of farms and a gradual increase in the size of the average business. The latter process, which has been under way for a number of decades, is at the same time accompanied by a progressive decrease in the utilised agricultural area (UAA). This has taken place due to less competitive businesses being pushed out of the market and their land being partially taken over by the surviving businesses or the businesses created out of mergers with the less competitive businesses. This phenomenon is particularly evident in the municipalities of the Apennine ridge and is also taking place in the dairy sector, leading to the creation of increasingly large companies that are better organised and more competitive.

In the mountain municipalities of Valle del Serchio, we can observe a structurally weaker agricultural economy made up of small and medium-sized farms that predominantly carry out extensive farming. It is chiefly the residential function of these farms that allows them to continue to operate, as does their ability to earn additional household income through other sectors. The importance of agriculture in these areas, therefore, lies in the fact that it reduces the risk of environmental deterioration by guaranteeing human presence on the land, rather than in its production function.

In the Lunigiana area, agriculture has always been one of the driving forces of the local rural economy, predominantly based upon family-run businesses specializing in the production of grains, oil and wine in the hilly areas, and in grain farming and chestnut tree cultivation in the mountain areas. However, here too the gradual consolidation of farming businesses can be observed due to economic and practical reasons, as well as the progressive ageing of local farmers.

SILVOPASTORAL FARMING ACTIVITY

A common feature of the high-altitude area, above 900m, is the presence of livestock farming. For communities in high-altitude areas, the rearing of sheep has historically taken precedence over the rearing of cows for reasons linked to the climate and orography of the area. The rearing of sheep, animals that are more rustic and less demanding than local breeds of cow, was the optimal way of sustainably exploiting the land and represented, along with chestnuts and firewood, the main source of livelihood for inhabitants of the area up until the 1960s.

Transhumance was practiced in winter towards the Versilia-Lucca plains, the Maremma and also, more recently, towards the Po Valley, while in summer it was towards the mountain pastures, such as - for example - the Prade Garfagnine (Fosciandora). In addition to being an economic phenomenon, transhumance has become a cultural fact, of relationship, of customs, which justifies the numerous linguistic, food and even behavioral influences of Tuscany in the Emilian ridge. From this practice the same tradition of the “Maggio drammatico” (form of epic folk theatre) was born.

Today virtually all of the livestock farms are sedentary and as in the past, dairy sheep are preferred; the most common breed is the Massese, which, being of medium-large size, is also able to supply a fair amount of meat. It currently accounts for about 70% of the sheep herd, which in total has about 10,000 heads of cattle in the Biosphere Reserve area.

Produce obtained from local sheep rearing includes Pecorino cheese, which is produced widely both by family businesses and dairy factories. In the territory of the Reserve, the Pecorino Toscano PDO is produced, while Pecorino cheese from the Reggio Emilia Apennines made from sheep's raw milk is included among the Slow Food presidia.

The territory of the Tuscan-Emilian Apennine Biosphere Reserve is equally characterized by forest-pasture and meadow-pasture landscapes and by the exercise of agro-forestry-pastoral activities. The task of protecting biodiversity in this area is based on the modern-day interpretation of processes that are often inseparable from silvopastoral farming activity, which is multi-functional and gives the landscape its distinctive appearance: the alternation of woodland and pastures up to the point where arboreal vegetation ends, riparian vegetation and hedges marking farm boundaries, the vast network of paths and tracks for use by shepherds and woodcutters, and the protection of springs to preserve the water resources that are vital during seasonal alpine grazing.

Across the whole territory, we can note the presence of public assets for communal use (e.g. usi civici or rights of common). These assets, which have different denominations depending on the area, are closely linked to the silvopastoral agricultural economy, as well as originating from the need to guarantee families from the local mountain communities a common minimum level of revenue by allowing public access to the (wood) forests and pastures in the area. The existence and maintenance of this system of public assets has helped to efficiently uphold the historical use of the land over time. In addition, it is an example of sustainable development being adopted and managed directly with the active participation of the local communities involved.

Within its territory of action, with regard to the forestry sector, the Management Body for Parks and Biodiversity of Central Emilia has focused on the development of associations between public and/or collective and private properties, on forestry planning interventions and on innovative projects concerning the multi-sectoral development of forest economy, by operating in accordance with the 2014-2020 Regional Forestry Plan of Emilia-Romagna.

THE ROLE OF CHESTNUT TREE CULTIVATION

The chestnut grove, as the symbol of the traditional Italian woodland landscape, played a major role for agriculture in the territory of the Biosphere Reserve. The wide range of products that can be obtained from chestnut trees – chestnuts for human and animal nutrition right up to ligneous products such as leaves – is, along with the plasticity of this species, one of the reasons why these trees occupy such a dominant position in the cultural landscape (also with the presence of monumental trees). the cultivation and farming of chestnuts has undergone a period of decline. In addition to the neglect of this activity, another reason for the fall in the number of chestnut trees is disease, such as cortical cancer and ink disease. The trees have also declined due to destructive activities, such as the practice of extracting tannin from their bark following their neglect. In addition, more recently a non-native parasite

known as the Chinese wasp (Dryocosmus kuriphilus) appeared in the area, against which since 2010, antagonist species have been introduced.

The great importance given to chestnuts in mountain areas was linked to the seasonality of production as the ripening of chestnuts takes place in late autumn and the flour produced allowed mountain populations to overcome the winter more easily. Another main reason for the important role played by chestnut trees in mountain areas was linked to chestnuts' greater nutritional yield per surface area unit compared with grains, given that their calorific yield per hectare was clearly higher than that of wheat (Pitte, 1986). Partly for this reason, chestnut trees used to be known as "bread trees" and for a long time the areas covered with chestnut groves were included among the agricultural lands instead of being considered lands covered with forests.

The cultivation of chestnut trees required the presence of crop farming or pastures in order to keep the undergrowth clear, meaning the activity was closely entwined with agricultural activities. The leaves of the trees were used as either fodder or litter for animals, while coppices would produce a wide range of ligneous materials suitable for combustion at a time when coal was extremely sought after by blacksmiths. A number of artefacts were associated with the cultivation of chestnut trees, such as kilns for drying chestnuts (the "metati") and mills for producing flour. These items formed part of a complex system, which, combined with the use of leaves for animals, characterised the culture and landscape of a large part of the Apennines. The term "chestnut culture", used to describe all of the links between chestnut tree cultivation and society, perfectly expresses the richness of this complex network of traditional relationships.

The cultivation of chestnut trees has undergone a slow revival in recent years, which can be attributed to growing demand for chestnuts and timber, the abatement of the most devastating tree diseases and the acknowledgment of the important role the chestnut trees play within the landscape. This cultivation definitely represents and may represent in the future an instrument for the sustainable development of the areas of the Biosphere Reserve.

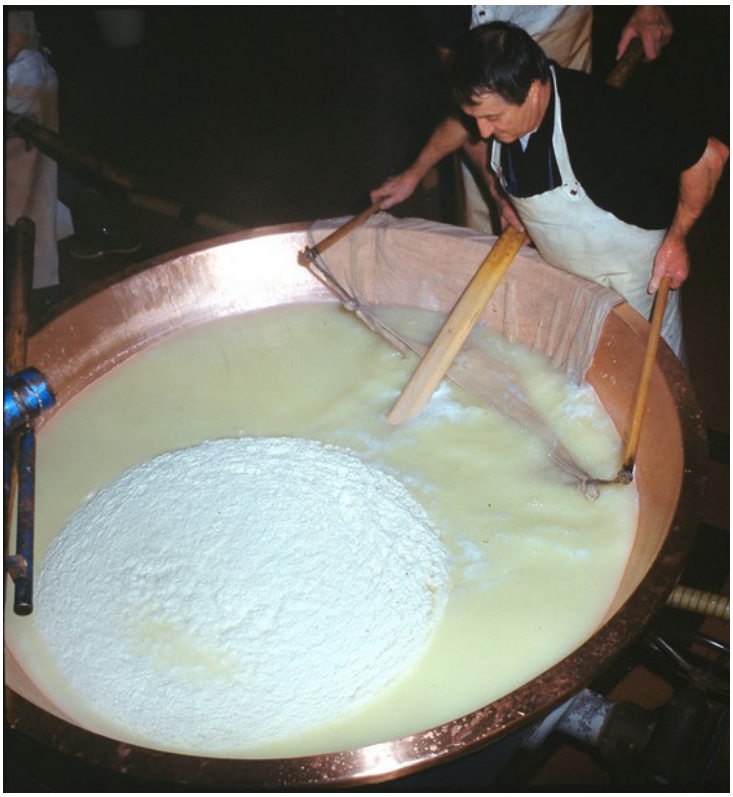


Figure 15.15 - Preparation of Parmigiano Reggiano cheese

INDICATE THE POSSIBLE POSITIVE AND/OR NEGATIVE IMPACTS OF THESE ACTIVITIES ON BIOSPHERE RESERVE OBJECTIVES (SECTION 14).

High-quality agriculture – an activity that is boosted in the area – is beneficial to the Biosphere Reserve insofar as it represents and promotes within-farmland biodiversity (through cultivation and livestock rearing). In addition, this activity makes up a key part of the landscape, meaning that it needs to be conserved not just for production purposes but so that it can continue to enhance the scenic, historical, cultural and ecological values of the area.

The tradition of practising agricultural and forest activity together has, in itself, a positive impact on biodiversity conservation, development and logistics as well as on the diversity of the scenic mosaic that typifies the rural landscape (such as the renowned one in connection with the DPO Parmigiano Reggiano chain). Also the activities of the livestock sector, despite the consumption of important quantities of environmental resources (soil and water) and the production of pollutants, in general do not have a negative impact: the reason is mostly linked to the type of farms that are mainly extensive and small and medium-sized, especially on the Tuscan side; in addition to this, these activities are also practiced in marginal areas of the territory, guaranteeing a very important action to protect those areas risking depopulation.

A positive underestimated impact that must not be underestimated, deriving indirectly from agricultural activity, also consists in the function of environmental protection especially in the most natural contexts, far from inhabited centers: the presence of man guarantees small maintenance and conservation interventions (e.g. maintenance of paths, terraces, dry stone walls and waterways) which can help reduce the risk of fires and the risks of hydrogeological instability.

Agriculture can also represent an important tool for sustainable development, as evidenced by the constant growth trend of agritourism companies and the important promotion activity of the numerous PDO, PGI, and CDO products of the territory.

WHICH INDICATORS ARE, OR WILL BE USED TO ASSESS THE STATE AND ITS TRENDS?

The number and size of local businesses, and the total number of workers employed in the sector are only three of the potential indicators for monitoring trends and developments in agricultural activity, and the positive impact of these on the area of the Reserve. A more useful method could be to gradually monitor trends affecting farms that are starting to offer accommodation and/or catering services, as well as companies that are choosing to focus – either exclusively or alongside other activities – on the production of high-quality produce (products certified as PDO, PGI or organic) or rearing native breeds of animal.

With a view to integrating other activities, in particular those related to tourism, the following could be assessed:

- increase in rural tourism (number of arrivals / presences, number of tourism enterprises, number of beds, index of use of beds);
- the diffusion of the "km0 menu" in the restaurants and hotels in the area;
- the number of adhesions and the methods of approaching the Reserve brand (I Care Appennino). Moreover, another indicator that will be used is the number of farms that choose to take part in

the forthcoming national Rural Development Programmes (2014-2020), the aims of which correspond to the development objectives that have been identified for the Biosphere Reserve.

Finally, the joining of producers and other stakeholders will be monitored throughout the territory of the Biosphere Reserve.

WHAT ACTIONS ARE CURRENTLY UNDERTAKEN, AND WHICH MEASURES WILL BE APPLIED TO STRENGTHEN POSITIVE IMPACTS OR REDUCE NEGATIVE IMPACTS ON THE BIOSPHERE RESERVE OBJECTIVES?

The farming activities of the Biosphere Reserve can represent the basis for a sustainable and replicable production system.

With regard to livestock rearing, future efforts have to be focused on keeping this activity extensive, with the traditional method of rearing livestock that involved using pastures for at least six months of the year combining the proper management of grassland with the production of extremely high-quality products. The aim is for these products to be sold at competitive prices on the local and national market, precisely due to the production specifications which they comply with, and their superior sensory and organoleptic qualities. The local authorities have carried out a large amount of work raising awareness among agricultural businesses in the area:

- the introduction of natural antagonists against non-native chestnut parasites;
- initiatives to promote crop and livestock farming, including for use in tourism;
- projects involving the Mountain Unions;
- actions aimed at restoring within-farmland biodiversity in terms of crops and livestock (e.g. the recovery of ancient grains and products obtained in cultivars, such as Savuret, in the municipalities of Casina and Carpineti);
- actions undertaken by the associations and consortiums for the protection of traditional products certified as PDO, DOCG (Controlled and Guaranteed Designation of Origin) and PGI, and products safeguarded by the Slow Food movement.
- Possible measures to be applied include (both in progress or to be implemented as part of the Reserve Management Programme; see paragraph 17.4):
- the provision of incentives and support for the cultivation of organic and biodynamic crops;
- maintenance of open spaces (meadows, pastures and clearings) by carrying out mowing and cutting on the Natura 2000 network sites with a view to conserving biodiversity;
- the application of a new regional law in Tuscany (the so-called “Rossetti” law) which will introduce a census of neglected agricultural areas and focus on ways of reusing them;
- the addition of new informative and demonstration-based events about local products via the Protected Areas’ visitor centres and via initiatives by the 5 Local Action Groups of the candidate area of the Biosphere Reserve (these groups are responsible for implementing the Rural Development Programmes, based on an existing EU model).

Figure 15.16 Traditional rural houses

- It should be added that system projects have been activated and developed in a unitary strategic perspective for the Reserve, such as for example:
- In 2016 and 2017 the Emilia-Romagna Region supports some project actions aimed at the knowledge and dissemination of the values of the Reserve;
- Internal Area Strategy: the Emilia-Romagna Region has adopted the UNESCO MaB recognition as a priority for the designation;
- ERDF ROP regional project involving the Biosphere Reserve on the Emilia side for a total amount of € 2,950 million;
- Funding pursuant to Regional Law L.R. 9/2006 - Apennine Geosphere, in collaboration with the Mountain Union of Municipalities of the Reggiano Apennines;
- Antico Frignano and Appennino Reggiano LAG which explicitly refers to the strategy of the UNESCO MaB program.

15.4. OTHER TYPES OF ACTIVITIES POSITIVELY OR NEGATIVELY CONTRIBUTING TO LOCAL SUSTAINABLE DEVELOPMENT, INCLUDING IMPACT/INFLUENCE OF THE BIOSPHERE RESERVE OUTSIDE ITS BOUNDARIES.

DESCRIBE THE TYPE OF ACTIVITIES, AREA CONCERNED AND PEOPLE INVOLVED (INCLUDING MEN AND WOMEN).

Within the territory of the Reserve, thanks to the connection between the agricultural and agro-food sectors, important production realities have developed linked to the transformation of products of excellence (especially PDO and PGI products) and other products.

For example, as well as supporting the production of PDO Parmigiano Reggiano, the dairy supply chain provides both the local area and supermarket chains with a range of artisan quality products such as milk, yogurt, panna cotta and puddings). Other examples include companies that process products from the undergrowth (mainly blueberries and mushrooms) systems for trout breeding and marketing processed goods. Another business that has been expanding recently is cutting and selling firewood.

In addition to restaurants, ski resorts and tourism and accommodation services such as hotels, guest houses, bed and breakfasts, holiday homes, refuges, hostels and campsites, there is a growing number of innovative businesses that complement the range of tourist facilities all year round. They include Adventure Parks (9 parks in the Reserve territory), organisations and associations that often offer alternatives to traditional sporting activities (such as canyoning, bouldering, mountain biking, snow-shoeing and ski touring) and associations of Nature and Walking Tour Guides and Tourist Guides.

The staffing levels are good in the public school, health and social services. Pre-schools, primary and secondary schools and libraries can be found throughout the area. In addition, the vast size of the Reserve means that it encompasses or is located near cities such as Parma and Reggio nell'Emilia where it is possible to find high schools, theatres, supermarkets, sports facilities and huge healthcare establishments, thus ensuring that it has a satisfactory supply of services of every kind and level.

A part from the agri-food industry with quality DPO and PGI products, industrial production businesses are rare; the hydroelectric power production industry, the mechatronic industry in Viano municipality, the ceramics industry, which has pits in the municipalities of Carpineti and Baiso (RE) and in the Modena area. Stone quarrying and processing is another sector that can be found on both sides of the mountains in the reserve; it is a specialist field with historical origins that provides materials for construction and decorative products. There are still a few small quarries that supply sandstone for cutting, which plays an important role in the renovation and restoration of products and buildings. Cork is used to make stoppers in a historical activity that developed in Cervarezza when many shepherds brought the production techniques home after learning them in the Maremma area. There are still three or four companies remaining from the dozens of workshops that were founded in the 1950s. The cork production tradition was also exported by families of

local craft workers, leading to the creation of two big industrial complexes: Eurosughero (which is based in the province of Parma) and Italsughero (which has factories in Reggio Emilia, Spain and Portugal.

Small businesses are widespread, with large numbers of service providers for the construction trade, subcontractors for nearby industrial districts, and retailers, even in the smallest villages.

In terms of business distribution, the community in the reserve is well balanced and rather vibrant. Both men and women are employed in the spheres described above, because there are no gender-based barriers when it comes to access to employment except for in the case of physically demanding jobs such as those that can be found in certain parts of the agricultural and manufacturing sectors.

The historical bent to entrepreneurship of Modena is underlined, which in modern times finds top expressions such as Ferrari, Bugatti, Maserati, Ducati, companies of great prestige and famous all over the world. From this point of view, the large territorial extension of the Reserve represents a strong potential added value, thus including fundamental ingredients for its human capital. The habit of undertaking, daring and, often, achieving success, added to the historical connection to Europe through the Brennero - not only ideally - could positively influence relationships and projects offering a general broadening of perspective and diversity of mindset approach. In fact, the Modena mountains breathe at a different pace than the rest of the Apennines, restoring the image of an active mountain. The activities described above are concentrated in the transition areas. In addition to the transition areas, tourist activities take place in the buffer zones, where people also cut wood and collect products from the undergrowth.

INDICATE THE POSSIBLE POSITIVE AND/OR NEGATIVE IMPACTS OF THESE ACTIVITIES ON BIOSPHERE RESERVE OBJECTIVES (SECTION 14). HAVE SOME RESULTS ALREADY BEEN ACHIEVED?

The activities discussed in the previous paragraphs are generally positive because they are necessary for the maintenance of the community and therefore of the humus which is fundamental for a sensible protection of the territory and for its development according to the intrinsic values of the UNESCO MaB program. At present there do not seem to be any significant conflicts between the performance of the activities described in paragraph 15.4.1 and the pursuit of the objectives of the Biosphere Reserve. Many of these in fact are aimed at satisfying the needs of the resident populations, from commerce to public services, and allow the residents themselves to "stay" on the territory. Furthermore, their location concerns above all the inhabited centers and the most densely populated areas, and therefore the Transition Areas, thus not creating conflicts with the parts of the Reserve subject to protection. It should be noted however that some contradictions exist: for instance, the hydroelectric power industry has a positive impact because it produces renewable energy, but it can also act as a negative force by creating critical situations in aquatic ecosystems.

In general, all product processing and marketing activities are a means of promoting the territory and spreading knowledge and awareness about the value of their home territories, especially in terms of sustainable tourism and biodiversity in cultivation and breeding.

The manufacturing industry, especially the food industry, is directly connected with the agricultural sector and also in this case positive aspects that are derived and that can be derived are higher in number than negative ones, as not only the material is processed locally, creating job opportunities for residents, but there are also opportunities related to commercialization. Just think of the potential linked to the products that are exported and that through well-defined projects can represent the territory and become real ambassadors of the Biosphere Reserve in the World.

The cutting of wood, a renewable energy resource, is not believed to have negative impacts: the activity is properly regulated in the area and represents a factor capable of counteracting the loss of landscape quality and biodiversity linked to the recent increase in woodoland area.

WHAT INDICATORS ARE, OR WILL BE USED TO ASSESS THE STATE AND ITS TRENDS?

The most effective indicators for monitoring the state of the activities are: the number of members of staff in each production sector, the employment rate (especially for young people and women), and public spending on the services provided.

WHAT ACTIONS ARE CURRENTLY UNDERTAKEN, AND WHICH MEASURES WILL BE APPLIED TO STRENGTHEN POSITIVE IMPACTS OR REDUCING NEGATIVE ONES ON THE BIOSPHERE RESERVE OBJECTIVES?

Measures to be taken to reduce negativ impacts concern specific areas:

issuing and/or renewing of permits for activities such as hydroelectric power production in order to reduce the risk of certain critical situations in river ecosystems;

strengthening of communication in order to mitigate potential and existing conflicts between breeders and farmers and wild animal species, specifically the Wolf;

environmental recovery of the areas at the end of the quarrying year on the basis of specific programs;

support to the construction sector, both in the new and especially in the recovery of the existing, to favor eco-friendly techniques and materials.

15.5. BENEFITS OF ECONOMIC ACTIVITIES TO LOCAL PEOPLE:

The main benefits that the economic activities described in the preceding paragraphs bring to the local communities are: a fabric of small, fairly widespread businesses (albeit with some differences on the two sides) and acceptable employment rates (particularly when compared to the domestic Apennine situation or that of the European mountains). These are accompanied by the presence of public education, health and administrative services, which were historically extensive but are currently in decline due to a combination of budgetary constraints and a drop in users.

The income from existing public and private activities in the area is supplemented by revenue from pensions (which is significant due to the population's high median age, particularly in the zones on the ridge) and from the incomes of the many working men and women who "commute", i.e. that are employed in the surrounding industrial and urban areas of the Reserve. Economic activities, particularly those related to agriculture and tourism, bring further benefits to the active conservation of the landscape, opportunities for cultural exchange and community vitality, particularly on weekends and during public holidays, in addition to maintaining and creating a user base for the network of public and private services

Unfortunately, specific data aggregation for the entire MaB area to support these considerations is not currently available and is only available for parts of it or for provincial or regional aggregations (see section 15.5.2).

FOR THE ACTIVITIES DESCRIBED ABOVE, WHAT INCOME OR BENEFITS DO LOCAL COMMUNITIES (INCLUDING MEN AND WOMEN) DERIVE DIRECTLY FROM THE SITE PROPOSED AS A BIOSPHERE RESERVE AND HOW?

It is not possible to accurately measure and separately quantify the benefits that the local communities derive directly from the territory of the Biosphere Reserve. Benefits arising from agriculture and tourism, which represent two areas that are very important for the area's economic development, are remarkable and strictly linked to the Reserve Values and are based on agro-silvo-pastoral systems, that is the pillar of economic life of small and medium centres.

The majority of agriculture-related businesses operate in the Transition Area, managing the territory in effect. With regard to Tourism, although most of the facilities fall in the Transition area, tourists are drawn to this area mainly for the combination of nature and culture (the relationship between man and biosphere), which distinguishes the entire Reserve, the focus of which is, however, in the core areas. The designation of the area as a Reserve is growing and could further increase income and intangible benefits, as it could bring about: a) cultural growth of the community: a mindful appreciation of the merits of the territory, cohesion, self-esteem, motivation in relation to studies, training, work, enterprise and an opening towards more wide-ranging exchanges; b) increased external recognition, with opportunities relating to tourism and the marketing of superior quality products.

WHAT INDICATORS ARE USED TO MEASURE SUCH INCOME OR OTHER BENEFITS?

At the moment there are none and there is no intention of adopting specific indicators.

With assistance from the Chambers of Commerce (primarily that of Parma, the Management Committee of which represents the stakeholders in relation to business, see section 17.1.8), the following factors are and shall be monitored with regards to the Municipalities:

- the ISTAT data and indicators where these can be separated out for the whole territory on demographic trends, GDP, employment and distribution of these data by sector, age group and sex, with a particular focus on the number of businesses and employees in the fields of agriculture and tourism, their turnover and youth and female entrepreneurship;
- the indicators and annual data of the Regional Environment Agencies (Agenzie Regionali per l'Ambiente) (ARPAT for Tuscany, ARPAL Liguria and ARPAE Emilia-Romagna), specifically in relation to biodiversity and factors relating to human pressure.

Figura 15.17 - Pieve di Sorano

15.6. SPIRITUAL AND CULTURAL VALUES AND CUSTOMARY PRACTICES:

DESCRIBE ANY CULTURAL AND SPIRITUAL VALUES AND CUSTOMARY PRACTICES INCLUDING LANGUAGES, RITUALS, AND TRADITIONAL LIVELIHOODS. ARE ANY OF THESE ENDANGERED OR DECLINING?

The territory of the reserve is steeped in rural culture and preserves the traditions and the spiritual, religious and cultural inheritance (see 10.3) shared by the peoples who live there.

In fact, since ancient times the ridge has never represented an obstacle to the exchanges between the two mountainsides and it still preserves nowadays the memory of ancient routes that were travelled for trade or religious reasons. These routes were known as the "Salt Routes" and were a network of paths that passed through the Reserve and led to the sea, where goods were exchanged for salt, a precious product for food preservation. Other important routes were the transhumance routes, which passed from the Apennines through the Garfagnana and led to Maremma; the Via Romea Nonantolana, the Via Romea Strata and Via Francigena, that deserves to be detailed. The Via Francigena crosses the Reserve with its numerous secondary trails (exVia Bibulca, Via delle Forbici) The hospices for pilgrims represent a testimony to this important transit in the territories of the Reserve and were built in a symmetrical way on the two mountainsides to make the displacement of people and animals safer and easier. These hospices were present along the main track, such as the Ospedale di San Giacomo (Filattiera), the Hospitale di San Bartolomeo (Fosciandora, the Ospitale di San Pellegrino in Alpe (Frassinoro), the Ospizio di San Nicolao (Giuncugnano) and the Ospizio di San Leonardo al Dolo (Villa Minozzo). Oratories, sanctuaries, monasteries and wayside shrines were built along the itinerary and sometimes replaced the existing places of prayer, such as the rural church Pieve di Sorano (Filattiera) built on a site that has been a place of worship since prehistory (the stele statues and the tombs from the Iron Age bear witness to this), the Pieve di Toano, the Badia romanica di Marola, the Pieve di Codiponte, the Abbazia di San Caprasio in Aulla, the Pieve of San Prospero and San Martino in Collecchio, and the countless churches dedicated to the Saints worshipped by the pilgrims

In fact, the sacred and the transcendent are values that remained intact over the centuries and even over the millennia although their form, rituals and religious belief have changed. Some geological and naturalistic elements, considered sacred since prehistory, transmitted their fascinating power on peoples materialising afterwards in testimonial and architectural artefacts and preserving a symbolic value which is still recognised today and not only by the local communities. Suffice it to think about the magnificent Pietra di Bismantova the "Mountain of Dante's Purgatory"), which was already a sacred mountain for the Etruscans and the Ligurians, where now stands the Hermitage of the Madonna della Pietra di Bismantova erected in the

seventeenth century by the blessed monks above a fifteenth-century church dedicated to the Holy Savior; the Monte Valestra (Carpineti), inhabited by Ligurians from the IX until the VIII century B.C. and called "sacred" because of the magical aura that surrounds it and generated from an interweaving of history and legends nourished by the presence of a tectonic cave known as the "Devil's Hole" housing the oratory dedicated to the worship of San Michele dating back to the period before Matilda of Canossa and the seventeenth-century oratory dedicated to the worship of S. Maria Maddalena. This worship is still very common today in the popular awareness and was traditionally celebrated on the 22nd of July with big bonfires that could be seen from far away. The Pania di Corfino (Villa Collemandina), whose toponym Pania probably has the same pre-Latin root of Apennines (for some researchers it even has a pre-Indoeuropean origin), in which pen means "summit, rise with sacred references". The Hermitage of Bismantova is now at the center of restoration and renovation activities by the Appennino Tosco-Emiliano National Park and by the Municipality of Castelnovo ne 'Monti on the inspiration of the UNESCO MaB values in defining a spiritual dimension strictly connected to the places and nature (the Pietra di Bismantova and the Papal Encyclical "Laudato Sii" as inspiration for the project); the Diocese of Reggio Emilia was also involved in public meetings on the subject.

On the Modena side, evidencing the strong spiritual dimension linked to places that make people resistant to their adversities, worthy of note is the very popular Via Crucis of Frassinoro (a living tradition since 1906) which parades through the streets of the mountain town over 500 people in any climatic condition. The event appears to be a means of social aggregation as well as a tourist attraction and was recently included in the list of Europassione (an international association that groups together the oldest religious representations in Europe). On the Tuscan side, a similar and ancient tradition is that of "I Crocioni" in the Municipality of Castiglione di Garfagnana, a historical representation of the death of Jesus (re-enactment of the Last Supper, the kiss of Judas and the passion of Christ) which is held every year on Holy Thursday before Easter.

The "Maggio" is a meaningful, original and unique expression of the rural culture to be found on both slopes with its relevant peculiarities. It is a dramatic performance in sung verses played outdoors by singers in costumes which derives its origins from the ancient propitiatory rites of spring. This form of popular theatre was formerly widespread and nowadays has to be protected from the risk of extinction. It is also kept alive, renewed and cherished only and most of all in Garfagnana and in the Apennines of Reggio Emilia and Modena by several Maggio companies, a documentation centre in the Montalfonso fortress and a museum dedicated to Villa Minozzo.

THE MAGGIO DRAMMATICO

It is one of the most interesting cultural and folkloric events of the Tuscan-Emilian Apennines, a traditional show of theatre and music. The Maggio Drammatico is an authentic expression of the oral tradition of the communities that have handed it down until today and has its roots in the typical ritual expressions of the agro-sylvo-pastoral culture and in the propitiatory celebrations, from which it probably derived its name, i.e. "Feste di Maggio", "maggiolate", "maggio". The performances of the Canto del Maggio are held on summer afternoons in clearings (often chestnut groves), farmyards and squares. The spectators are arranged in a circle around the actors on the scene, who revive the stories of knights challenging each other to a duel in the eternal fight between good and evil. The texts,

which are most of all inspired by the epic-chivalrous tradition, are written in aulic Italian (mainly quatrains of octosyllabic verses and octaves of hendecasyllables) and are sung by actors in costume accompanied by essential pieces of music played with traditional instruments (violin, accordion and guitarThe scenery is basic and handcrafted, the costumes are richly decorated and equipped with real armour. Every object in the scene (whether they are costumes, weapons or small buildings) is entrusted with a precise symbolic language, which accompanies the singing, the face mimicry, the movement of feet and the intense gestural code and together provide the interpretation to the whole show.

The Maggio Drammatico is popular in the entire Tuscan-Emilian Apennines and is spread nowadays by active companies in the Reggio Emilia and Lucca areas. The National Festival of Popular Theatre (Rassegna Nazionale di Teatro Popolare) celebrated the 41ST edition this year and is held every summer gathering all shows in a single programme.

"La Galleria del Maggio" was set up in the regional capital of the Municipality of Minozzo. It is a museum on the Maggio Drammatico and a documentation centre where texts, costumes, drawings, pictures, videos, specialised magazines and scene objects are displayed to visitors in order to spread and preserve the memory of this ancient popular tradition.

Another noteworthy folkloric event-rite is the secular one of the lighting of the "Natalecci" in the Municipality of Minucciano (in the hamlets just south of the limit of the Reserve): these are tall columns made by the inhabitants of the various hamlets by weaving branches of juniper to a chestnut pole that are lit as bonfires every year on Christmas Eve. Besides representing an auspicious ritual for the following year, this tradition reminds people of the link with the nature of the area: the intertwined towers are made with timber obtained from cleaning of the woods and undergrowth.

Hence, the Tuscan-Emilian Apennines do not only host major historical events. In fact, they were mainly and are still nowadays a place of everyday life, sociability, cooperation and sharing of common spirituality and feeling. In brief, due to a decades-long loss of population and to signs of subordination and cultural decay deriving from the dynamics of industrialisation in the nearby districts on the plain and the coast, which prevailed and dominated until a few years ago, it is a place where people now tend to renew an awareness and a memory that has been lying dormant for centuries and to transmit to new generations a pride of identity that is positive, modern and open to the world.

Some contemporary musical bands and theatre companies, inspired by the cultural and environmental roots of the Tuscan-Emilian Apennines, sometimes using local dialects are also important: the association, Anima Montanara, Corte Transumante di Nasseta.

The Apennines slopes are also linked by some traditional craft activities: a museum (Cervarezza – Reggio Emilia) is dedicated to cork manufacturing, an historical record of the bonds between the transhumant shepherds of the Emilian slope and the Tuscan world from which the raw material came. This tradition took root in the 19th century and is still common thanks to the qualified activity of some companies.

It is also worth mentioning the ancient crafts, some of which are in decline or have disappeared (the lumberjack, the coalman, the "picciarìn" – who worked and carved stone – the shepherd, the "cavallaro" and the farmer) and some traditional food products which bring together all the territories of the reserve, such as sheep's milk cheese.

The most representative means of sustenance of the rural culture of the Reserve is undoubtedly chestnuts, which are playing an important role again with the training and promotion of an extensive product chain.

The forest resource and its prevailing coppice use are regulated in the Emilian mountain area and in Garfagnana by the rights of common, i.e. plots owned collectively on which the members of the community exercised cultivation, grazing and forestry rights. Moreover, rights of common represent a real element of social organisation and cohesion.

These ancient crafts mixed with traditions and folklore, in their simple and ritual reoccurrence, represented the binding agent between people and the territory. The use of dialect is very widespread in all the territories of the reserve, especially among the older population. The dialects of Reggio Emilia and Parma are spoken on the Emilian slope and represent idiomatic varieties of the Emiliano-Romagnolo language that was recognised as a European minority language by the Council of Europe and was listed by UNESCO among the "Definitely in danger" languages in the "Atlas of the world's languages in danger".

In the Reggio Emilia Apennines and especially in the Vetto-Baiso line towards the high ridge, a combination of dialects is spoken, whose characteristics change even from one village to another. A dialect similar to the Emiliano-Romagnolo dialects is also spoken on the Tuscan slope, in the Lunigiana area.

In the Frignano area the dialect takes on a very particular connotation (assimilation to Lombard dialects), giving the idea of the cultural mosaic that has however been preserved in this stretch of the Apennines starting from strong implications of a physiographic nature with respect to the distribution of settlements and streets communication practicable between them.

The dialects of Alta Garfagnaga are also widely influenced by the dialects of Northern Italy, whereas the influences of the dialect of the Lucca area (a Tuscan form) become gradually less frequent as we go up the River Serchio and especially in the villages on the ridges. A dictionary of "Garfagnino" (Dizionario garfagnino) was recently published by the Bank of Identity and Memory of Garfagnana (Banca dell'identità e della memoria della Garfagnana.

INDICATE ACTIVITIES AIMED AT IDENTIFYING, SAFEGUARDING, PROMOTING AND/OR REVITALISING SUCH VALUES AND PRACTICES.

The reserve extensively pays great attention to its history, traditions and cultural values which are recalled and told by means of initiatives, events, projects and exhibitions.

The use of dialect is still so alive in much of the reserve that it is the subject of studies, investigations, theatre performances and even publications, such as the "Dizionario garfagnino" or the newspaper "Gazzetta di Parma" which also publishes articles in dialect in its website version.

Municipal tourist offices and the associations are very active everywhere and perform functions of social gathering and promotion of local identities.

The associations are sometimes also in charge of collecting the rural cultural heritage in order to tell it to a wider audience. For example, this is the case of exhibition facilities such as the "Museo Uomo-Ambiente" of Bazzano (Neviano degli Arduini), that belongs to the network "I musei del mondo rurale" in Emilia-Romagna and was created by the cultural association, "Il camino", which is in charge of the management and cultural and research activity.

The museums of rural culture, scattered on the territory of the Reserve and present in the 6 provinces, help to keep the memory of the different lifestyles alive by storing tools and recalling ancient rural practices.

The museum of cork in Cervarezza has the specific task of narrating and protecting the traditional cultural heritage and also houses the mountain department of the tourist information office of Reggio Emilia, thus managing to attract a larger number of potential visitors.

The museum of Villa Minozzo celebrates the Maggio tradition permanently with a remarkable quantity of texts, theatrical costumes, charters of groups and associations, drawings, pictures, videos, specialised magazines and objects. The National Festival of Popular Theatre, which celebrated its 41st edition in 2019, also helps to preserve this traditional form of art and organises a schedule of road shows that take place between June and August in several places in

- *Figura 15..18 – Example of ecotourism: snow trekking*

Garfagnana and in the provinces of Reggio-Emilia and Modena, thus reuniting the villages of the Tuscan-Emilian Apennines with the celebration of a common tradition.

Another important action of promotion is represented by the numerous cultural and wine-and-food events, such as festivals and local fairs organised all over the Reserve and based on the excellent products of this area, such as, to mention only a few: the Fair of PDO Parmigiano Reggiano in Casina, the Festival of PDO Prosciutto di Parma (that also involves the municipalities of Calestano, Corniglio, Langhirano, Lesignano de' Bagni, Neviano degli Arduini and Tizzano Val Parma), the Fair of the Apennine Horse in Comano, the Fair of the PGI Farro (spelt) of Garfagnana in Piazza al Serchio, the Fair "Sapori" in Fivizzano dedicated to the typical Lunigiana products and the numerous festivals of chestnuts, mushrooms and wild berries. In addition to these events, there are also interesting marketing and promotion events connected for example to dairies and cheese factories, such as "I concerti della Via Lattea". The first edition of this festival was held in 2003 and since 2011 it has also included the concerts of "I Suoni DiVini". This festival aims to bring live music to unusual places such as cheese factories, gatehouse, cellars, vinegar cellars and other buildings related to the typical production activities of the Emilian territory.

From the food and wine point of view, an important action to promote Parma's excellent products is carried out by the Food Museums circuit which, in addition to purely tourist purposes, enhances food as a product of the culture of the territory, of the memory of its community, of practical knowledge and artisan skills.

The transhumance is another ancient cultural phenomenon that is recalled and celebrated with many initiatives, such as theatre and music events and hikes to retrace the ancient routes of the Apennines towards the Maremma passing through the Garfagnana. The entire ancient Via Francigena has been promoted for more than ten years thanks to the European Association of the Vie Francigene.

Among the effective actions put in place to preserve ancient traditions and customs, it is worth mentioning the functional architectural renovation work with an educational aim of the "metato", i.e. the place where chestnuts are dried before they are ground to flour Even in the production of the renewed quality products, the ancient, original drying and grinding techniques are used again, and the use of ancient cultivars from the area is reintroduced (such as the Fontanaluccia chestnut flour).

The presence of the Consortiums of chestnut growers, who are actively involved in solving the problems connected with chestnut groves (Asian chestnut gall wasp), contributes to give a new and further impetus to this plantation and to keep the chestnut culture alive, at the same time preserving the landscape of the chestnut groves, which was widespread and is now in decline in the entire Reserve.

Practices for the recovery and enhancement of pig breeds are also important in the territory of the Biosphere Reserve; a clear example is provided in the Parma area by the "Biodiversity rural farm Rosa dell'Angelo" raising free range black pigs and allows guided tours to disseminate the farming method as well as to show the production of sausages and cold cuts.

Finally, it is worth mentioning that the Appennino Tosco-emiliano National Park has recovered abandoned pastures in Logarghena and Orecchiella with projects connected to the promotion of local breeds such as the Corniglio sheep, the Massa sheep and the Garfagnina sheep. Moreover, the pastures of Ramiseto were also recovered and are now used by the Ventasso horse.

HOW SHOULD CULTURAL VALUES BE INTEGRATED IN THE DEVELOPMENT PROCESS: ELEMENTS OF IDENTITY, TRADITIONAL KNOWLEDGE, SOCIAL ORGANIZATIONS, ETC.?

By extending the modus operandi of the National Park and regional Parks Bodies to the entire area. Particular attention should be given to the economic, social and identity aspects involving relevant associations, Chambers of Commerce, schools and local associations.

SPECIFY WHETHER ANY INDICATORS ARE USED TO EVALUATE THESE ACTIVITIES. IF YES, WHICH ONES AND GIVE DETAILS.

The following elements will be efficient indicators:

- the quantification of the initiatives aiming to promote and enhance culture, to which the public as well as enterprises and associations subscribed;
- the number of tourists in visitors centres and museums (of Maggio, cork, rural culture, Italian resistance movement, etc.) and educational facilities (eg. "metati"-chestnut drying kilns);
- the number of educational and teaching programmes in primary and secondary schools and universities;
- More detailed indicators will be included in the Management Programme

16. LOGISTIC SUPPORT FUNCTION

16.1. RESEARCH AND MONITORING

DESCRIBE EXISTING AND PLANNED RESEARCH PROGRAMMES AND PROJECTS AS WELL AS MONITORING ACTIVITIES AND THE AREA(S) IN WHICH THEY ARE (WILL BE) UNDERTAKEN IN ORDER TO ADDRESS SPECIFIC QUESTIONS RELATED TO BIOSPHERE RESERVE MANAGEMENT AND FOR THE IMPLEMENTATION OF THE MANAGEMENT PLAN (PLEASE REFER TO VARIABLES IN ANNEX I).

The research and monitoring activities currently carried out in the Biosphere Reserve territory are many and varied. They are mainly concentrated in the Core Areas and the Buffer Zones, which are more interesting from a scientific point of view because of the presence of the Appennino Tosco-Emiliano National Park, of the Regional Authorities for Parks and Biodiversity of Central and western Emilia and the Rete Natura 2000 Sites.

The designation of the Biosphere Reserve in 2015 highlighted the need to strengthen more research studies into issues that promote the sustainable presence of man in the areas of the Apennine ridge, of high biodiversity and climate vulnerability in an interdisciplinary way that includes the topics of conservation of biological diversity, the development of compatible economic activities, the maintenance of existing cultural values.

Research programmes and activities have been mainly curated by the Appennino Tosco-Emiliano National Park, which can boast important participation in European projects, including transnational ones. These projects and programmes include: LIFE08 NAT/IT/000369 GYPSUM, LIFE14NAT/IT/001129 BARBIE, LIFE 13 NAT IT 728 MIRCO – wolf. The National Park and Ente Parchi dell'Emilia Centrale (Central Emilia Parks Authority) are also working hard on the front of an INTERREG dedicated to the experimentation of new forms and models of sustainable tourism (INTERREG CEETO) of which the Emilia Romagna Region is the leader and in which the UNESCO MaB Biosphere Reserve of the Po Delta is also involved.

The most significant programmes and projects in progress - which may have relations with the Reserve management programme - are:

1) LIFE 14 NAT/IT/000209 HERMIT – "Coordinated actions to preserve residual and isolated populations of forest and freshwater insects in Emilia-Romagna". For a description of the project, refer to Chapter 14.2.4 of this dossier.

2) GLORIA – "Global Observation Research Initiative in Alpine Environments". The territory of the Appennino Tosco-Emiliano National Park accounts for one of the sites of the GLORIA network. It is a project that has its roots in the 90s of the last century and which has found its development in the first decade of the 2000s with the European project "GLORIA – EUROPE". Today it has established a global network for the observation of alpine environments. The aim of the network is to collect data on vegetation and temperature to understand their trends, assess and predict the loss of biodiversity and other threats to alpine ecosystems that are currently under increasing pressure from climate change. It is highlighted that this international project coordinated by the Austrian Academy of Sciences and the University of Vienna has received important scientific awards and has started a collaboration with the UNESCO-MaB network since 2005.

3) WAC – "Wolf Appennine Center". The project has three primary objectives: to set up an interregional observatory (northern Apennines) to deal with management problems related to the presence of the wolf; to encourage the development and implementation on a medium-large scale of shared actions for monitoring and managing the species that guarantee its long-term conservation also through the mitigation of the human-wolf conflict; to reduce the prejudices associated with the wolf and help improve the perception of its presence among the general public and stakeholders in particular.

4) "Restoring the abandoned pastures of Logarghena". It is a project aimed at limiting the critical elements for the Natura 2000 site of Monte Orsaro (SIC IT5110002) which are represented by the abandonment of grazing activities in the summit grasslands and the recolonisation of shrub species.

5) Also significant were the research and monitoring activities on habitats and species, recently carried out for the drafting of the Specific Conservation Measures and the Management Plans of the SICs and SPAs found in the Reserve. Tools carried out by professionals, specialists and University Departments: their approval has made it possible to update the state of knowledge and to provide precise indications on the continuation of monitoring and management activities in the Natura 2000 Network Sites found throughout the Reserve and which will be considered in the Reserve Management Programme.

6) The "Men and Forests programme" aims to change the perspective from which man looks at forests: from a firewood factory to first ally to tackle climate change. This is the first major objective of the project, which takes the form of an institutional reference centre for public bodies, consortia or private citizens on the sustainable forestry management front. It is a major cultural project that wishes to involve all stakeholders in the field of forests on a large area, first of all inviting them to sit around the same table to start thinking about the role that forests will be called upon to play for future generations.

7) LIFE 18 CCM/IT/001093 AGRICULTURE is an innovative project aimed at demonstrating that even thanks to good cultivation practices carbon can be stored in the soils. For the benefit of fertility and also of the atmosphere.

Held in the heart of the Appennino Tosco-Emiliano Biosphere Reserve, financed by the European Union, it has its centre of gravity between Reggio, Modena and Parma. The advocates are the Reclamation Consortia of Central Emilia and Burana, the Appennino Tosco-Emiliano Park and the Animal Production Research Centre.

8) LIFE18 NAT/IT/000806 LIFE CLAW aims to improve the conservation status of Austropotamobius pallipes crayfish which needs urgent conservation measures and is listed in Annexes II and V to the Habitats Directive EEC93/43. Many Natura 2000 sites with different geographical characteristics are involved in the project (see areas of intervention section) in which habitat restoration measures are planned. The partnership includes the Appennino Tosco-Emiliano National Park Authority, the Management Board for Parks and Biodiversity of Western Emilia and the Antola Regional Park, which are Natura 2000 site management bodies. This will facilitate the achievement of the results, and in particular the increase in the presence of native crayfish in the territory, thanks to the reintroduction and restoration of suitable environments, able to support vital populations, even after the end of the LIFE-CLAW project.

9) The SEAPs (Sustainable Energy Action Plans), which many Municipalities and mountain unions in the area - members of the Covenant of Mayors - are also about to

conclude, will be able to provide management guidelines and indications in the implementation of policies in the field of sustainable energy to be included in the Reserve Management Programme.

10) A fruitful collaboration with the University of Parma, with which agreements are in place aimed at:

- studying plant biodiversity in the Sites of Community Interest of the Tuscan side of the Appennino Tosco-Emiliano National Park;
- acquiring knowledge on open and forest habitats in evolution towards later ecological stages.

In addition to the National Park, other subjects have activated and are activating important research projects within the territory of the Reserve. By way of example we mention "Soil4wine", in which the Parks of the Dukedom participate. It is a European project aimed at improving land management in the farming sector, especially as regards the wine-growing landscape. The aforementioned LIFE14NAT/IT/001129 BARBIE and LIFE 14 NAT/IT/000209 HERMIT are also developed within the Parks of the Dukedom (both) and Central Emilia (LIFE HERMIT). Finally, there are numerous projects that the local park management Authorities of Emilia Romagna are developing in relation to the Regional Rural Development Programme (RDP) 2014-2020.

The following projects are worth mentioning:

- fundrising project "Fondo Verde" promoted by the Regional Authority for Parks and Biodiversity of Central Emilia which presents itself as an innovative tool to make local citizens and businesses experience the issue of the safeguard of protected areas with a view to social responsibility. Such a project could be a best practice to be used at the level of the entire territory of the Reserve.
- Common good landscape: The landscape is a fundamental component of cultural and natural heritage and a fundamental element of individual and social well-being (European Landscape Convention). The general objective of the educational offer is to increase the knowledge and sense of belonging of one's territory by each student.
- The "Project for the restoration and enhancement of the Estensi Places of Reggio Emilia" - funded by the Ministry of Cultural Heritage and Activities - has a strategic value in the context of the city development policies, both from the point of view of safeguarding and enhancing the historical, artistic and cultural heritage, and with regard to the aspects of tourism promotion and improvement of urban quality. The actions focus on the places of strong connection with the Apennine territory: the Reggia di Rivalta (Royal Palace of Rivalta) - ducal residence of the Este until 1796 - is today at the centre of a unique architectural-territorial and landscape system; the Eighteenth-century Promenade that connects various points of interest from the bridge of San Pellegrino (gateway from the Apennines); the Mauritian, Emilian Renaissance villa in a park enclosed between the Rhône creek and the Cavo Ariolo (artificial water body), elements of naturalistic value in continuity with the ecological-river corridors that connect the mountain area with the urban area.
- Prospera Project –INTERREG (2019-2023) is a cooperation project aimed at exchanging good practices on the theme of protecting the natural heritage in peri-urban areas against the risks of excessive urbanisation.
- Projects to enhance ecological river corridors for bicycle-pedestrian use, both for tourism and to encourage sustainable travel.

SUMMARIZE PAST RESEARCH AND MONITORING ACTIVITIES RELATED TO BIOSPHERE RESERVE MANAGEMENT (PLEASE REFER TO VARIABLES IN ANNEX I).

The research and monitoring activities carried out on the territory of the Reserve have been numerous and multidisciplinary: the Appennino Tosco-Emiliano National Park (PNATE), which at the time of its establishment included the Alto Appennino Reggiano Regional Park and part of the Cedra and Parma Valley Regional Park were together among the main promoters and attractors of this type of action.

The territory of the Reserve - especially relating to the Core and Buffer areas, those most suited to conservation, with their biotic and abiotic components, - boasts remarkable experience in participating in European and transnational projects. In this context, LIFE Projects are significant, structured in such a way as to include both research and monitoring activities and concrete management actions, as well as education and dissemination of results, over significant time intervals. In particular, it was the recipient and partner of the following projects, now completed:

1) LIFE09/ENV/IT//000188 Enviromental Cooperation model for cluster - ECO-CLUSTER, LIFE07/NAT/000502 EXTRA (www.lifextra.it) and Co.R.E.M. - Sub-project C Establishment of a MARITIME observatory (www.projectcorem.eu).

2) LIFE08 NAT/IT/000369 GYPSUM (www.lifegypsum.it): protection and management of Habitats associated with the gypsum formations of Emilia-Romagna (2010-2015). The project has put in place numerous actions concentrated in an area of particular value such as that of the Triassic Gypsum Outcrops (Buffer and Transition Area) with monitoring of habitats and bats, analysis of the threats still present and proposal of interventions and actions aimed at a medium and long-term management of these fragile ecosystems.

In particular:

- monitoring of habitats, bat colonies, karst aquifers;
- drafting of information and educational material (panels, brochures...);
- instructive-educational activities in schools and information activities for the public (bat nights);
- development of a specific management plan for this karst area;
- naturalist restoration work with hydraulic and morphological restoration of the Poiano Sources area to favour partially compromised habitats with the aim of enhancing biodiversity - once much richer and greatly reduced as a result of anthropogenic interventions; the reintroduction of 2 species disappeared in that field (Triglochin palustre and Carex Davalliana) in collaboration with Veneto Agricoltura – Plant Biodiversity and Out of Forest Centre of the Veneto Region;
- preparation of an information space on Triassic Gypsum Outcrops, aimed at being familiar with the characterising aspects: geology, geomorphology, caving, the underground system, the presence of habitats and species of Community interest, the naturalistic peculiarities of this SIC.

3) Following the important naturalist restoration intervention carried out at the Sources of Poiano, a specific PhD was activated (2014-2017) with the University of Modena and Reggio Emilia - M3ES Models and Methods for Material and Environmental Sciences - Department of Life Sciences - "Census of Emilia Romagna's (Italy) ponds: location and ecological characterisation of different typologies for their management and conservation". This is an activity of research, monitoring and ecological characterisation of ponds, with particular reference to the naturalist restoration area of LIFE GYPSUM in the post-intervention phase and therefore useful for future management aspects.

Other previous and completed projects concerning research and monitoring purposes of the Reserve area have been developed and managed by the National Park and the ceased "Parco Regionale Alto Appennino Reggiano" (High Reggiano Apennines Regional Park) and "Parco Regionale Valli del Cedra e del Parma" (Cedra and Parma Valley Regional Park) and are widely described in the Application Dossier (attached). A list is reported below: LIFE95NAT/IT/000610 Conservation measures of relic populations of Abies alba Miller, Picea excelsa Lam., Taxus baccata L. and of their natural habitats in the Emilia Apennine; LIFE96NAT/IT/003115 Preservation and conservation of Canis Lupus populations through biological surveys and non-poaching; LIFE97NAT/IT/004163 Conservation actions for Apennine Abies alba and Picea excelsa forests and Apennine beech forests with Abies alba; LIFE00NAT/IT/007214Wolf conservation measures in 10 SICs of three parks of the Emilia-Romagna Region; LIFE00NAT/CP/IT/000046 Carnivores and zootechnics: instruments for harm prevention; "Monitoring and conservation of the Golden Eagle (2004-2005); "Preliminary study on the Golden Eagle" (2009); "Study of populations of rare and threatened species" (of the High Reggiano Apennines Regional Park in collaboration with the University of Pavia); "Landscape Project"; "Study of the evolution of the agro-forestry landscape in the Appennino Tosco-Emiliano National

- *Figure 16.1 – Example of educational activities performed in the Biosphere Reserve.*

Park" (2008-2009); "Knowledge and Enhancement of geological heritage" (with the University of Modena and Reggio – Department of Earth Sciences); "TRIAS I and II", (with the Italian Speleological Society and the University of Bologna, Department of Earth Sciences); "Road network between the Po Valley and the Tyrrhenian Sea: archaeology and history between Canossa and Luni" (with the Department of Archaeological Sciences of the University of Pisa); "Research and study actions for the characterisation of bedding plasters and mortars made with the use of gypsum for the realisation of the recovery interventions of the historic and monumental building located in different locations of the National Park, characterised by the proximity of Triassic Gypsum Outcrops"; "Tassobbio Valley" (naturalist, archaeological, geological-geomorphological study that has become a publication).

In the past, important research studies have been carried out in addition to supporting numerous Degree and PhD theses, of which we recall the dissertation of some significant issues useful for the management purposes of the Reserve, such as: biological-ecological approach to management processes for the definition of environmental flow (DMV) for some mountain streams, numerous studies on the wolf and the effects of its presence, analysis of interventions for the management and conservation of certain lakes; the protection of sources; solutions for hydrogeological accommodation in some streams, use of wolf habitat, wild boar, roe deer, environmental quality assessments of streams in relation to the tourist flow, socio-economic assessments of the Apennine territory.

INDICATE WHAT RESEARCH INFRASTRUCTURE IS AVAILABLE IN THE PROPOSED BIOSPHERE RESERVE, AND WHAT ROLE THE BIOSPHERE RESERVE WILL PLAY IN SUPPORTING SUCH INFRASTRUCTURE.

The University of Modena and Reggio - which proposes itself as an advisor for scientific activities within the Management Committee of the MaB Reserve - shall take care above all of the research and monitoring functions and will also operate in close relationship with the other universities (especially Bologna, Parma, Pisa, Florence that already operate on the territory of the Reserve, but also foreign universities) and Research Bodies (CNR , ISPRA) on the key themes of the designation of the Reserve.

Even other structures and services, institutional and not, such as Observatories of the Chambers of Commerce, Regional Agencies for the Protection of the Environment (ARPA), Regional Services (Geological and Seismic, Waters, Nature, Basin Technical Services), the Reggio Children Foundation, the International School of Italian Cuisine of Parma (ALMA), the Bank of Identity and Memory of Garfagnana together with universities and research institutes can continue to make their own important contribution at the request of the Reserve Management Committee, also activating degree and doctoral theses on topics of interest. The Biosphere Reserve is favouring and can favour the implementation of a system of collection and monitoring of ecological, socio-cultural, educational and training data. Using the research facilities present, it plans and can plan and conduct multidisciplinary study and analysis programs on biodiversity issues, innovative models capable of inspiring the sustainable socio-economic development of local populations, climate change, science pedagogy to spread knowledge and sensitivity to guarantee the protection of ecosystems, providing areas of experimentation and demonstration.

16.2. EDUCATION FOR SUSTAINABLE DEVELOPMENT AND PUBLIC AWARENESS:

The collaboration, participation and involvement of people in order to raise the collective consciousness have been the essential soul of being and becoming a Biosphere Reserve since the presentation of the candidacy and in these years post-designation. These concepts will have to remain stable as a guideline for governance that has been launched.

Several important events have included and revived these value premises of the Tosco-Emiliano Apennine Biosphere Reserve:

- the successful "MENU' a Km Zero" ("Zero-Mile Menu") festivals, which today resulted in the project of the Reserve "UPVIVIUM – Biosfera Gastronomica a Km Zero" ("Zero-Mile Gourmet Biosphere) (for detailed information please refer to chapters 13.4 and 15.2.1 of this dossier and to the website www.upvivium.it)
- Participation of the Tosco-Emiliano Apennine Biosphere Reserve in the 7th World Tourism Exhibition CITY AND UNESCO HERITAGE SITES (Padua, September)
- CAI evenings with presentations of the Tosco-Emiliano Apennine Biosphere Reserve ongoing activities and projects (Reggio Emilia, September 2016)
- Evening dedicated to knowing of the Appennino Tosco-Emiliano MaB Reserve as part of an exhibition related to the topics of evolution (Sarzano Castle, Casina October 2016)
- Conference "Analysis and proposals for the UNESCO MaB Reserve in the Reggio Apennines" organised by the UNESCO Club of Reggio Emilia (Carpineti, October 2016)
- Seminar "Tourism in the Biosphere Reserve": over fifty tour operators from Lunigiana, Garfagnana and Emilia discussed tourism and in particular the repercussions that international designation can have on the territory. (Sassalbo, November 2016)
- Dialogues and testimonies on Food, Environment, Agriculture for the inauguration of the exhibition "Behind food sustainability" (Castelnovo ne' Monti February 2016)
- Interview on Taking care of the Apennine Land organised by the Reclamation Consortium (Reggio Emilia February 2017)
- Meeting on food and environment agriculture (Canossa, April 2017 on the occasion of the inauguration of the UNESCO exhibition)
- Participation with a delegation in the EuroMAb in the Dordogne (France) in March 2017
- Speech at the conference "Tourism in the UNESCO MaB Reserves: experiences and opportunities in comparison" at the Po Delta Biosphere Reserve on 27th April
- 2-4 June 2017: participation in the food and wine fair "GolaGola Festival" in Parma with presentation of the cutting board of UNESCO products, local producers and reserve values in general through wine-gastronomy
- The UNESCO Club Promoter Committee of Carpineti was born: launch on Saturday, June 17th, 2017 with book presentation "The Apennines for man". Other activities have been carried out in the

following months, in particular the entertainment for the San Vitale Fair in Carpineti on the last weekend of August 2017

- Saturday, June 7th, 2017 in Pania di Corfino (LU): "The endemic Apuano - Apennine flora" curated by the Botanical Garden "Maria Ansaldi"
- Participation in the "MaB Youth Forum" at the Po Delta Reserve from 18th to 23rd September 2017 with a group of representatives of young people from 18 to 35 years old. In preparation for the event, a first information meeting was organised at the Sarzano Castle on 15th June followed by another one on 7th September 2017, before departure, for the definition of how to participate in the World Forum at the Union of Municipalities in Castenovo ne' Monti
- 6th-7th July 2017: visit of a delegation from Coldiretti Rovigo to the Tuscan territory with a view to exchanges between Biosphere Reserves: visits to local companies and debate on issues such as agriculture, tourism, the World Youth Forum. One day spent at the 5 Terre National Park, a UNESCO World Heritage Site) is added to that from the perspective of a large area and relations between UNESCO sites
- 13th July,2017: meeting with UNESCO Club Reggio Emilia for an update on the activities of the Apennine Biosphere Reserve
- July 2017: participation in the UNESCO "Summer School" in Sardinia on management and tourism in the MaB Reserves
- Summer 2017 project "Comiks" - Training stay in South Korea at the Korean National Arboretum in Seoul: meeting with representatives of the Gwangneung Forest World Biosphere Reserve
- Summer 2017 Land(e)scape project: supra-municipal project presented by an association with a series of events to promote art and the territory
- Apennine Geosphere: a supra-municipal project presented by the Mountain Union of municipalities of the Reggiano Apennines, for the discovery and knowledge of the Reserve geosites
- 3rd October 2017 meeting of Reserve Companies in Castelnuovo Garfagnana
- 10th October 2017 in Corneto di Toano (RE), opportunities and projects for Biosphere Reserve companies
- 19th and 20th October 2017 - international workshop "The social role of companies for the development of UNESCO MaB Biosphere Reserves"
- 12th November 2017, Palanzano (PR) Conference "Companies and the Appennino Tosco-Emiliano MaB Reserve"
- 24th November 2017 - Amandola (FM) Seminar "Central Italy calls UNESCO", public meeting of presentation of the candidacy to UNESCO MaB Area of the territories affected by the 2016 earthquake and the Inland Areas of the Sibillini Mountain. Intervention /testimony of the Appennino Tosco-Emiliano Biosphere Reserve
- 4th December 2017 - "I CARE APPENNINO": the brand of the UNESCO MaB Reserve. The guidelines for grants to socially and environmentally responsible companies and organisations were approved
- Sassalbo, 8th February 2018 - Permanent Advisory Assembly in Parma

- Sassalbo 18th January 2018 - The cooperative La Valle dei Cavalieri di Succiso was awarded a prestigious prize for innovation in tourism by the UN World Tourism Organization (UNWTO) in Madrid
- 28th May 2018 – The Di Onda in Onda Workshop at the Venice Biennale as an example of entertainment project of Aree Interne. The project stemming from the experience of the Workshop of Ligonchio is among the projects exhibited at the 16th International Architecture Exhibition, Venice Biennale
- 14th November 2018 - The Appennino Tosco-Emiliano Biosphere Reserve participated in the 1st National Meeting of UNESCO MaB Reserves. The important event took place at the Biosfera Somma - Vesuvio e Miglio d'Oro Biosphere Reserve
- 19th February 2019 in Fivizzano – Awarding of the "I Care Appennino" Brand.
- 21st February 2019 in Fivizzano - Presentation of the Reserve Action Plan at the 3rd Advisory Assembly
- 9th April 2019 - Dublin, the Appennino Tosco-Emiliano Biosphere Reserve is attending EUROMAB 2019
- 19th February 2020 – Parma – General Assembly, action plan presentation and proposal for the extension of the Park.

Environmental education is one of the fundamental tasks entrusted directly to National and Regional Parks by Framework Law 394.

In the Appennino Tosco-Emiliano National Park, environmental education activities as "value in itself" and as support for the promotion of the territory and the Park itself, have grown in quantity, in quality and also in the range of proposals, with multiple and different contents, forms, times and partnerships involving public and private stakeholders.

The environmental education proposed by the Park has not had an academic approach and has aimed to combine the proposals of values and problems of the environment, with the knowledge and identity of the territory and the Park itself: the choice - already tested as positive - to propose disciplinary and pedagogical contents together with the sensory and relational physical experience through immersion and stay at least over 24 hours in the territory has proved to be fundamental. This has also more or less directly achieved the complementary outcome of an investment in medium and long-term territorial promotion.

The initiatives for environmental education of the National Park first, and more generally of the Appennino Tosco-Emiliano Biosphere Reserve, have been actualised by:

1. allocating an annual budget to the public schools of the territory, annually accompanied by a training seminar aimed at managers and teachers, for study micro-projects with the environment and/or the Parks as their topic, projects drawn up and managed independently by schools and teachers, as part of their ordinary scheduling (in 2014 the seminar of 11th-12th September had the contents proposed in the Application Dossier of 201/15 as its theme);

2. exhibitions/stays/lessons organised directly by the National Park. It is Neve Natura (Nature Snow) and Autunno d'Appennino (Autumn of the Apennines), which have a now defined identity and format and also a finalisation of emphasising the value of seasons, locations and specific opportunities of the different parts of the territory. They take place in culturally homogeneous modules, yet flexible from the organisational point of view in relation to meteorology, localisation,

user needs, using, from time to time, services (lessons, accompaniment, logistics) and the locations most suitable for the characteristics of the program;

3. realising and managing this project in partnership with ENEL and according to the pedagogical guidelines of Reggio Children, of the Atelier delle Acque e delle Energie (Workshop of Water and Energy) "Di Onda in Onda" in Ligonchio (for more information please refer to chapter 16.1.3 of this dossier);

4. realising and managing this project in collaboration with the Province of Reggio, of Dedalus (laboratory of protected nature), with licensed entrusting of the structures and management for all intents and purposes to private operators (Cerwood Adventure Park), according to a special agreement;

5. realising and managing specifically targeted projects as WAC - LIFE EX-TRA with the use of Park facilities (Pala Lupo) and with logistical support and collaborations in various ways with the visitor centres and information points.

In line with its institutional purposes and with the objectives of the Reserve, the Appennino Tosco-Emiliano National Park organises environmental education, science pedagogy and awareness-raising programs on sustainable development issues, designed to involve a heterogeneous audience by age and experience. The activities carried out place a direct approach to the environment, science and art at the centre. Such approach is complicated, yet non-ideological and not assertive a priori. The direct experience and the quest for answers by each one are elements of a path in which the environment, with its values, its logics, its contradictions naturally encounters "the amazement of knowing" the basic elements of the physical and natural world.

The specific objectives of the different activities are calibrated on the users, as well as the working approach, languages and methods used. The aim is to build together the critical tools necessary to understand the importance of conservation of natural resources, the exploration of ecosystems, the reading of the historical and anthropological aspects of the landscape in a modern key.

The designation as a "Biosphere Reserve" represented the opportunity to strengthen and standardise the modus operandi of the National Park, also bringing it back to the other territories, focusing on the ability to integrate the "traditional" topics of environmental education with the in-depth analysis of the territorial identity and support to the preservation of the extensive mountain farming supply chain and sustainable eco-tourism.

Environmental education aimed at schools as well as citizens is at the centre of activities also proposed by the Sustainability Education Centres (CEAS) of the Parks of Central Emilia and Western Emilia (Parks of the Dukedom), which are part of the educational network of Emilia Romagna in connection with the Regional Centre of Environmental Education.

The Centre of Parks of Central Emilia carries out educational activities mostly aimed at compulsory education and proposes themes recognised as priorities by the Authority, developing them with visits outdoors and in classroom meetings. For the year 2018/19 the highlighted proposals are represented by the educational paths: "Landscape: common good", to stimulate the multiple interpretations (objective and emotional) that the landscape can offer as well as to make us reflect on the role that each of us can have on its construction and safeguard; "Insect world", to understand the importance of variety and diversity in nature and to know the species covered by the LIFE HERMIT project. Also important are the "Green Stays" which include activities

"DI ONDA IN ONDA" – WORKSHOP OF WATER AND ENERGY IN LIGONCHIO

The Biosphere Reserve intends to place a new educational approach to scientific issues at the centre of environmental education programs based on what is proposed by the Atelier delle Acque e delle Energie (Workshop of Water and Energy) in order to promote a strong idea of childhood and education and to improve the quality of life of children, families of communities. The Atelier of Ligonchio has been created with a "vision" that puts water and energy together. A greater awareness of the relationships between water and energy is also the first objective declared by the United Nations for the World Water Day. It is a place where both the physical phenomena and the matter and expressive qualities of water and energy can be explored through experimentation and exploration in specifically designed settings which offer plenty of materials and opportunities. The cognitive approach proposed by this project encourages children, young people and adults to look at things in an unusual way, to be curious and to raise questions on what is apparently impossible to explain, to research and try again, to formulate hypotheses and theories and to try to confirm them through experimentation. "Di Onda in Onda" is an indoor and outdoor atelier, i.e. multiple, differentiated and comprising several experimentation places, called "camps", located in the territory. There are external spaces, considered suitable and located within the area of the National Park, and internal spaces, located within the Enel hydroelectric power plant and in the headquarters of National Park in Ligonchio (Municipality of Ventasso), so as to ensure the presence of a single big workshop where exploration and external and internal experimentation mingle and stimulate one another.

This allows children and young people to explore some phenomena of nature in the external spaces by delving into the environment and the seasons in a perceptive and emotional way which makes experimentation more comprehensive and allows them to join in more easily. In order to have a quality learning process, it is necessary for pleasure and effort to be present at the same time: a participatory motivation to learn is a fundamental element that adults should always consider when planning and arranging environments for children to work in individually or in groups. All the spaces in the workshop are designed taking into account the relationship one with the other and the seasonal changes, without a linear progression but with possible processes and combinatory explorations. Their main point of reference is the topic of sustainable development.

More in general, the Atelier culture - which originated in the framework of the educational experience in Day Nurseries and Kindergartens in the Municipality of Reggio Emilia - means keeping creativity and rationality, theory and practice together. It also means gaining experience, creating connections and "thinking with your hands". In this sense, the ateliers represent unusual experiential contexts in which to train creative thinking, learn in groups and experiment with different "languages".

The Atelier is recognised by the Emilia-Romagna Region and is located near one of the gates of the National Park. It is one of three strategic projects identified by the Multi-year Plan for Economic and Social Development (PPES) because of its characteristics as a centre of excellence and pedagogical research. The project and experience of the Atelier di Ligonchio is among the projects exhibited at the 16th International Architecture Exhibition, Venice Biennale 2018, as part of "Arcipelago Italia", curated by Mario Cucinella as a project able to underline the role that contemporary architecture can play within settlements far from large centres and at risk of marginality, in other words a project that can bring vitality and innovations in the interior areas.

"Today the Atelier Onda in Onda offers Ligonchio as a place of incoming and as a catalyst for educational tourism. It was indeed a creative operation, which also had its problems, but on the whole, it has achieved great success, it has released added value in a difficult territory and in particular in its inner part, high and at demographic risk. We aim - also stimulated by this recognition by Venice - to relaunch and renew it in a dynamic dialogue with the new municipality of Ventasso, with Bodies, companies, associations, people and of course with Reggio Children and the Reggio Children Foundation. Their contribution has been and will be essential to guarantee continuity and innovation to a project that needs the quality that is moreover recognised by having been selected as an example of local entertainment."

Fausto Giovanelli, Chairman of the Appennino Tosco-Emiliano National Park

of several days aimed at acquiring a greater and organic information on the subject of the experience developed on one or more areas belonging to the Central Emilia Parks Authority. Special projects are also proposed by CEAS itself such as "the Atmospheric Path", a path for climate change education that includes a visit to the Climate - Environmental Observatory "Vittori" of the CNR-ISAC and to the Meteorological Observatory of the Air Force of Mount Cimone (Municipality of Sestola, MO). The initiative is made possible by the collaboration with the Meteorological Service of the Italian Air Force (C.A.M.M. Mount Cimone), the Frignano Park, the Municipality of Sestola (MO) and Arpa Emilia-Romagna. Along an educational-environmental itinerary composed of 10 information panels along the C.A.I. 449 path, students and visitors can reach the summit of Mount Cimone where guided tours to the workshops take place.

CEAS Emilia Occidentale (Western Emilia) deals with sustainability education in the Parks of the Dukedom and proposes projects concerning topics ranging from the discovery of fauna to the ecology of the forest or river, up to geology or bird watching. Priority proposals are educational activities related to "Biodiversity", "Park as Common Good", "Water and Territory" and "Human-Animal Coexistence". The centre has also activated a "Teacher's Desk" as a free and personalised consulting service in order to support the design of detailed educational paths or participation in funding calls, orientation to the choice of educational paths and educational/logistical support for environmental education activities.

The environmental education within the Appennino Tosco-Emiliano Biosphere Reserve intends to become a laboratory of sustainable development, capable both of spreading knowledge and awareness to guarantee the protection of ecosystems, and of experimenting innovative models capable of inspiring a modern culture of sustainability and of the territory in young people and in general in local populations.

The dissemination of environmental education activities in the Reserve will make it possible to link the conservation and development functions of the area more closely, since conservation action can only be successful through a process of awareness-raising, involvement and training of local populations, who, on the other hand, will be able to seize the opportunity of social and economic rebirth only by understanding the peculiarities of their territory.

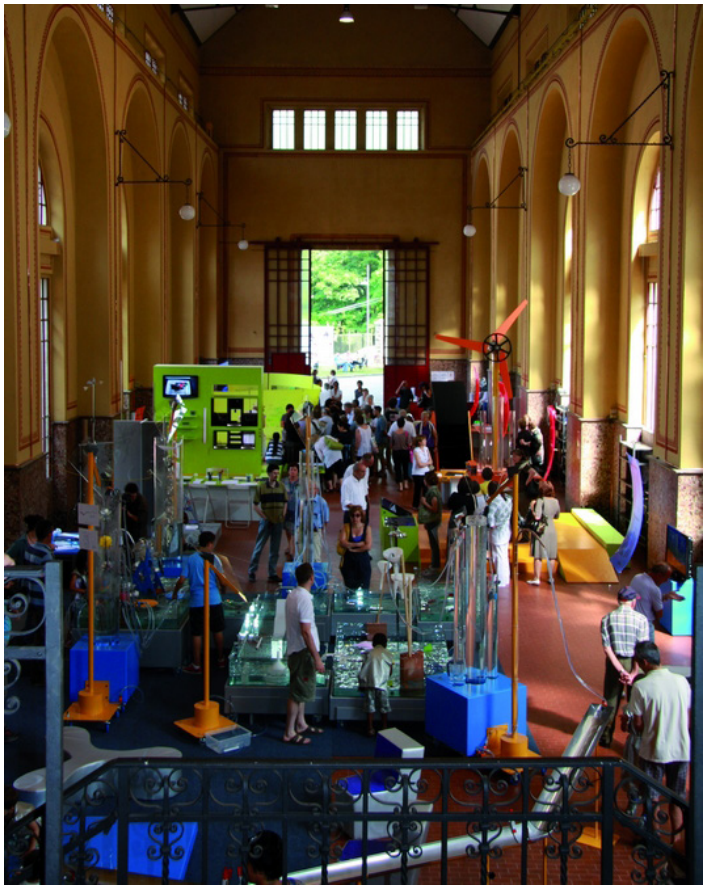


Figure 16.2 - Atelier "Di Onda in Onda" in Ligonchio

The ability to extend collaborations outside the territory of the Biosphere Reserve is of fundamental strategic interest for the Biosphere Reserve, thus enhancing its know-how in terms sustainable development, conservation and environmental education through exchanges.

The collaborations activated by the Appennino Tosco-Emiliano National Park with the University of Parma are important and they regard: project "Cooperation of Ecological Networks in the Mediterranean - CoREM"; study of the biodiversity of SICs in Tuscany; acquisition of knowledge on open and forest habitats in the evolutionary phase towards later ecological stages. Other Memoranda of Understanding have been pursued over time by the National Park with: Cinque Terre National Park, Montemarcello-Magra Regional Natural Park, Apuan Alps Park and several other Universities. The collaboration between the main Park Authorities of the Biosphere Reserve (National Park – Central Emilia Parks – Parchi del Ducato) has also been effective for some time.

DESCRIBE EXISTING AND PLANNED ACTIVITIES, INDICATING THE TARGET GROUP(S) AND NUMBERS OF PEOPLE INVOLVED (AS "TEACHERS" AND "STUDENTS") AND THE AREA CONCERNED.

The activities, projects and initiatives of environmental education that have been promoted over the last few years by public and private stakeholders, and whose reference targets are students, teachers, local communities, tourists and visitors, have been mentioned in the previous point and are further described in the reference annex. This annexe describes more precisely the main initiatives carried out by the organisations active in the territory of the Biosphere Reserve. Every initiative is accompanied by a description of its educational aim, its reference target (teachers, students, tour operators, families, tourists etc.) and the number of users that it has reached.

With regard to environmental education and sustainability within the territory of the Reserve, mention should also be made of the activities proposed by: the Orecchiella State Nature Reserve, the Rossena and Campotrera Regional Reserve", the ECOPARCO-Pinetina di Vezzano sul Crostolo, the Reclamation Consortium of Central Emilia, the numerous operators (Parks Visitor Centres, Cooperative Societies and Hiking Environmental Guides) who address both the school world and the general public.

ACTIVATED PARTNERSHIPS

UNESCO first mission is to strengthen human capital and the school is its first and most natural habitat. The quantity and quality of the reception reserved for the UNESCO Appennino Tosco-Emiliano MaB Reserve in schools was extraordinary. Making young people and teenagers aware and motivated about the potential and excellence of the Apennines is a valuable investment.

In addition to what was filed in the Candidature Dossier dated 2014/2015 and already carried out mainly by the Appennino Tosco-Emiliano National Park in the years before its designation, the environmental education work performed by the Management Bodies for Central and Western Emilia Parks and Biodiversity now complements it. In addition, since 2014 the network of "schools in the National Park" has opened

up to the 34 Municipalities of the current Biosphere Reserve involving more than 30 public educational Institutions (out of the 32 present in the territory). In the Three-Year Plans of the Educational Offer (PTOF) of schools, not only the formal adherence to the principles and objectives of being a Biosphere Reserve of these territories is actualised, but also the active organisation of the participatory construction of territorial identity through projects and training actions dedicated to teaching staff and students based on the values of the environment and the landscape and on education for sustainable development. Collaborative projects between the various institutions of the different territories and projects based on mutual knowledge and exchanges are currently underway.

- S.Y. 2014/15: 14 annual educational projects involving over 1800 students and 150 teachers.
- S.Y. 2015/16: 24 annual educational projects involving over 3000 students and 270 teachers and 2 Erasmus projects involving entire Institutes and students from partner countries.
- S.Y. 2016/17: 20 annual educational projects to which 4 projects aimed at schools outside the Reserve that involve a total of over 2700 students and about 200 teachers are added.
- MaB and Park themed co-project collaboration for PON Call for Bids in the school (12 projects) *Comment add 2018-19.
- Collaboration in drafting IIS Nelson Mandela Call for Bids for Schools and people coming from Emilia-Romagna living abroad (eligible for funding).
- Collaboration in the realisation of the Olympics of Taste (IIS Pacinotti).
- Collaboration with the Summer School Emilio Sereni "Abitare la Terra" (Inhabiting the Earth).
- Extension of the Humans Project by the Apennine Park in the World to the Reserve: research action that is part of the path started about ten years ago by the Apennine Park in the World project, promoted by the Appennino Tosco-Emiliano National Park, Union of Municipalities of Reggio Apennines with the aim of enhancing and restoring relations with those who had left their land in the past and of arousing interest and curiosity towards the places of the Apennines to be rediscovered and safeguarded. The project involves several partners at local, national and international level and acts on different levels of belonging: the village, a place of emotional ties; the Reggio Apennines, a place of enlarged community; the Apennines in the World, a place of thousand places, residence of affective citizens, appointed ambassadors of the territory of origin.

The educational projects, realised during each school year starting from the three training seminars (September 2014, 2015, 2016) for teachers and managers who unravelled the theme of the UNESCO Reserve ("Coded Name Apennine", "Exchanges between the value of the cultural relationship and dialogue", "Plots: the grammar of exchanges between local and global") and saw the participation of more than 360 teachers and school leaders.

The seminar "The melody of the Earth, taking care, safeguarding, preserving" was held in Fivizzano (MS) on 8th-9th September 8-9, 2017. The Workshop dedicated to teachers of schools of all levels - which are based within the Appennino Tosco-Emiliano Biosphere Reserve - marks the start of the new school year and the planning of cultural and educational activities to be carried out outdoors. The 2017 edition was dedicated to the development of topics related to conservation as a cure and to the awareness of the impact of our actions

PARCO DUCALE (DUCAL PARK) OF PAVUOLLO: A HISTORIC GARDEN, AN EXAMPLE OF BIODIVERSITY CONSERVATION IN THE URBAN ENVIRONMENT

The Giardino Ducale (Ducal Garden) of Pavullo is a shining example of a historic park within an urbanised settlement able to offer also an area of conservation of biodiversity in addition to an important recreation space for the local community. Hit in December 2017 by a disastrous wind storm that brought down over 70 tall plants, then by an unusual copious snowfall in May 2019, the forest was in a dreadful state. Now it is the subject of an important recovery action by the Municipality of Pavulo, which, in collaboration with the University of Florence - departments of Landscape and Agricultural Architecture, - is preparing a "Plan for the conservation of the Ducal Park , a document containing all the information necessary for the restoration, care and maintenance of the park, including the metric calculation of the various operations to be carried out and the various furnishing to be acquired. The recovery of the Doge's Park will also experiment with planting techniques and conservation techniques of the historic garden, in particular in the flower beds overlooking the Doge's Palace (up to the small fountain) will be planted historical collections of different species including: bergenias, bulbous plants, hellebores, hemerocallis, hibiscus, irises, liriope, roses, syringas, peonies. The choice of plants was made with a philological criterion and obtained the favourable opinion of the superintendence of architectural heritage.

What has become clear from most of the interventions is the fact that a Historic Park is a reality that lives and changes over time for an infinite number of different reasons; its restoration must therefore be inserted in the cultural, social and natural context of the moment in order to give the Park its own physiognomy, character, personality.

on the environment, interpreting them from the point of view of the humanistic, scientific and social disciplines to reach a shared synthesis that can be the basis of common action, in the knowledge that man and nature are part of a single system in which everyone - no one excluded - must exercise individual and collective responsibility. The teachers and School Heads who participated this year are over 120 and come from all over the territory of the Reserve and from many municipalities of Tuscany which have established close relationships with the National Park for a long time (stakeholder that currently coordinates the activities of the Reserve).

Other activities underway regarding education and training carried out in the area of the Biosphere Reserve are the following:

- school-work alternation activities with High Schools;
- alternation CCIA (Chamber of Commerce) of Madrid (3 female students);
- university internships for theses on nature education, culture and conservation;
- School-Work Alternation project on the UNESCO topic: mapping of traditional knowledge with ITKI platform – High Schools of the Provinces of Massa and Parma (in progress)
- Architecture Summer School with the Polytechnic University of Milan: The Poet's house;
- Landscape of the MaB area Summer School with the Emilio Sereni Foundation;
- multi-year project to study sustainable tourism and to exchange good practices between the National Park and Adirondack Park with Paul Smith's College of New York to discover the National Park and the UNESCO Appennino Tosco-Emiliano Biosphere Reserve as part of the multi-year project;
- "School in the Park" residential training seminar entitled "Traces in the Woods. Knowledge, sensations, paths: laboratory, Apennines, landscape" held in Sassalbo with the collaboration of the Appennino Tosco-Emiliano National Park - Biosphere Reserve and the Department of Culture of the Municipality of Castelnovo ne' Monti. The seminar was an opportunity for teachers and administrators to retrace concepts and topics that had emerged during the work of the past school year to develop new projects that allow deepening knowledge, gaining awareness, increasing the sense of responsibility and the will to be active citizens, an integral part of a common mindset aimed at the sustainable development;
- project "Landscape School of the Parmigiano Reggiano cheese" (in collaboration with Cervi Institute and the Municipalities of Casina, Carpineti and Neviano degli Arduini);
- November 2017, visit to UNESCO in Paris with students of the Mandela Institute as part of the network programs between UNESCO schools and Territorial Development of MaB areas;
- in total in the school years 2015 - 2016 - 2017 (including schools related to Environmental Education projects of the Regional Reserve of the Rupe (Cliff) of Rossena and Campotrera), over 70 projects, over 8,000 students contacted, over 650 teachers involved.

Many of the projects and initiatives listed have included or had an impact also on the territory relating to the proposal of extension of the Reserve.

For a complete, detailed list of activities and continuity of initiatives, refer to: http://www.mabappennino.it/nov.php?totalRows_ris=233&chiave=&page=1

16.3. CONTRIBUTION TO THE WORLD NETWORK OF BIOSPHERE RESERVES:

HOW WILL THE PROPOSED BIOSPHERE RESERVE CONTRIBUTE TO THE WORLD NETWORK OF BIOSPHERE RESERVES, ITS REGIONAL AND THEMATIC NETWORKS?

The designation of the Tuscan-Emilian Apennines as Biosphere Reserve has enriched the worldwide network of UNESCO MaB Reserves through the following contributions:

- The contribution of the "Reggio Approach", i.e. the know-how and the educational approach promoted by Reggio Children, that expresses itself through the atelier culture and has already been tested by the Park with the project "Atelier di Onda in Onda" (Workshop) in Ligonchio;
- the contribution of the agricultural and food sector on the relationship between biosphere conservation and the pursuit of a quality agriculture, which aims to produce quality products according to ancient and strict production rules (Parmigiano Reggiano cheese, honey and networks among beekeepers, Prosciutto di Parma, other PDO and PGI products);
- the contribution of the application of a philosophical approach to territorial marketing that links the Reserve Brand to the concept of "taking care". This is the branding strategy "I CARE APPENNINO" - a project included in the Action Plan of the Biosphere Reserve. The strategy aims at the identification and enhancement of the territory and its communities, addressing first of all the residents and businesses of the territory, and secondly customers and tourists, intended as protagonists of the life of the Reserve. The "I CARE APPENNINO" brand can be requested by all stakeholders - public and private, profit and non-profit, inside or outside the Reserve - who realise or support projects and initiatives aiming at a sustainable development and "taking care" of the territory, biodiversity and communities of the Tuscan-Emilian Apennines.

THE CONTRIBUTION OF THE EDUCATIONAL APPROACH OF REGGIO EMILIA

The project "Atelier di Onda in Onda" was started in 2010 and allowed a relationship to be created - which is nowadays very well-established - between the Appennino Tosco-Emiliano National Park, Reggio Children S.r.l. and Reggio Children Foundation – Loris Malaguzzi International Centre.

Reggio Children S.r.l. was created in 1994 as an international centre for the promotion and the defence of children's rights to manage educational and cultural exchanges that had been started up a few decades before among the childhood institutions in the Municipality of Reggio Emilia and teachers, professors, researchers

and scholars from all over the world. This centre maintains active relationships with educationalists and institutions from more than 120 countries in the world and, as a publishing house, it publishes books that are translated into 20 languages. (www.reggiochildren.it).

Reggio Children - both locally and nationally - organises training initiatives, promotes research projects, provides advisory services in the field of education, participates in initiatives of cooperation with childhood institutions in several countries, manages the Touring Exhibitions "The Hundred Languages of Children" (I cento linguaggi dei bambini) and "The Wonder of Learning" (Lo stupore del conoscere), in collaboration with other promoters, and manages and coordinates the activities and projects of the Loris Malaguzzi International Centre.

The Reggio Children Foundation is a national and international research centre that acts in situations generating new knowledge and innovations with the aim of improving the quality of life of the children and families from the communities. It spreads the values of the "Reggio Emilia Approach" all over the world through comparison with other countries and educational experiences, by promoting, developing and supporting projects of social and socio-educational interest and of cultural integration on a national and international level. This is also done through the management and development of initiatives in the sectors of solidarity and international cooperation. (http://reggiochildren-foundation.org).

The International Network was created with the representatives of the Countries with which Reggio Children has been in contact for a long time and on a more regular basis and it represents the several reference points of Reggio Children in many countries of the world.

It is a kind of transnational project of the educational community of Reggio Emilia which supports international dialogue and the sharing of responsibility with the aim of promoting the identity and the activity of Reggio Children and the International Centre Loris Malaguzzi. Every country has a unique identity and represents in its turn different realities, within which the International Network commits itself to maintaining the centrality of the Reggio Emilia Approach.

"...it would be really interesting to see the map of the entire world: and those who belong to it feel tied to something that is by now symbolic rather than a geographical reality. This is a new cultural geography, made up of people who agree to share values. A geography that goes beyond the traditional geographical boundaries and creates a network between people who have the same sensibility and common ideals..." Carla Rinaldi, President of the Reggio Children Foundation.

Within the framework of the MaB UNESCO candidature of the Tuscan-Emilian Apennines, Reggio Children offers from an operational point of view:

- an effective contribution in determining the educational strategies of the MaB area by extending and spreading the experience of the "indoor and outdoor workshop" tested in Ligonchio;
- a contribution to the creation of the governance model for the MaB together with the Appennino Tosco-Emiliano National Park and other local socio-economic stakeholders;
- a proactive role in the development of relationships and exchange of experiences with the MaB World Network. It also organises training activities and conferences specifically addressed to the contact persons of the world MaB areas together with the Appennino Tosco-Emiliano National Park at the "Atelier di Onda in Onda" in Ligonchio and other places. During these events it will be possible to

examine in depth the knowledge acquired on the learning processes used by children in their encounters with scientific phenomena, taking the experience of the indoor and outdoor atelier of Ligonchio as a reference.

THE CONTRIBUTION OF THE AGRICULTURAL AND FOOD SECTOR

The contribution of the agricultural and food sector developed in this border area between Europe and the Mediterranean is based on the great wealth and originality of its food products, mingled with stories and cultures and deriving from short agricultural supply chains that can combine technological innovation with traditional rearing and farming methods. Moreover, the territories of the Tuscan-Emilian Apennines boast an enviable record that guarantees and certifies the quality of the agricultural and food sector: more than 60 products coming from little more than 20 thousand hectares have been certified with the Slow Food label and the European PDO and PGI labels.

In an area where the conservation of natural resources and biosphere represents the most important element - which is inherent in the UNESCO MaB Reserves - it is particularly important to have products that are certified according to the PDO and PGI specifications of the European Union. In fact, these specifications represent an instrument to safeguard consumers as regards the quality of products and a valid way of protecting the typical characteristics of the production methods and, indirectly, the landscape which has a duty to maintain its qualitative characteristics assiduously.

To this end, the Appennino Tosco-Emiliano National Park has always stood out for its commitment to research and environmental education activities aiming to improve the quality of the techniques of mountain agriculture, typical of the Apennine territories, and to spread them in the local communities. From this point of view, designation as a UNESCO MaB Reserve can only serve to further boost the commitment of the Park from the perspective of research and improving the agricultural and food sector. This is due to the fact that, besides giving a strong impulse in pursuing sustainable development, it also represents a great opportunity for exchanging information with other protagonists of the World Network of Biosphere Reserves which can consider the Tuscan-Emilian Apennines as a model to emulate in which quality agriculture and protection of the environment coexist and are closely linked.

WHAT ARE THE EXPECTED BENEFITS OF INTERNATIONAL COOPERATION FOR THE BIOSPHERE RESERVE?

All those supporting the candidature of the Tuscan-Emilian Apennines are well aware of the benefits that this territory would have with the creation of relationships and the implementation of actions of international cooperation within the framework of the world network of the UNESCO MaB Reserves.

The aim is not “only” to gain better visibility and higher prestige for the Reserve territory on a national and international level and, consequently, to ensure a better implementation and promotion of the sustainable development of the territory (in particular of eco-tourism). The aim is also and, most of all, the opportunity to have a valuable and continuous exchange of information and best practices with international

institutions, that are similar even though quite different, on the protection of biodiversity, environmental monitoring, scientific research and experimentation, environmental education and professional training according to the paradigms of sustainable development and the opportunities for compatible economic development and social cohesion.

The benefits deriving from these exchanges and collaborations with other Biosphere Reserves at national and international level are well known to the Management Committee of the Appennino Tosco-Emiliano Reserve which is seizing opportunities and developing important projects for the future. For example, mention should be made of:

the national UPVIVIUM project (it has also obtained an accreditation from the UNESCO MaB National Technical Committee) in collaboration with the Biosphere Reserves "Alpi Ledrensi and Judicaria", "Delta of Po'", "Sila", "Islands of Tuscany", involves restaurateurs and agri-food producers of the territory supporting and strengthening their synergies;

the international MEL project, which promotes the biological and cultural diversity deriving from beekeeping through the collaboration of 5 Biosphere Reserves on the shores of the Mediterranean (Tuscan-Emilian Apennines, "Terres de Ebre" (Spain), "Valleé du Fango" (France), "Jabal Moussa" (Lebanon) and "Djebel Bouhedma" (Tunisia).

16.4. INTERNAL AND EXTERNAL COMMUNICATION CHANNELS AND MEDIA USED BY THE BIOSPHERE RESERVE:

The designation as Appennino Tosco-Emiliano Biosphere Reserve represented a great opportunity for the Tuscan-Emilian Apennines to enhance their natural and historical-cultural heritage. Hence, communication represents a means for the Reserve of communicating its commitment in terms of sustainable development as well as a useful resource for spreading and conveying an updated awareness of the values of its territory to the outside and to local communities.

In the candidature phase of the Reserve and in the years following its designation, the communication channels have been mostly entrusted to the Appennino Tosco-Emiliano National Park Authority; among these communication channels, the official website of the Appennino Tosco-Emiliano National Park is the undoubtedly most visited one (it can be consulted at the following link: www.parcoappennino.it). To date, the Biosphere Reserve has its own specific official communication systems, starting from the website (www.mabappennino.it) up to communication tools such as: videos, books, brochures and official gadgets.

IS (WILL) THERE (BE) A BIOSPHERE RESERVE WEBSITE? IF YES, WHAT IS ITS URL?

After the designation as Biosphere Reserve, an official website (www.mabappennino.it) was created that replaced the website of the Appennino Tosco-Emiliano National Park as a reference.

On the official website (www.mabappennino.it) users have the opportunity to: delve into the topic of the UNESCO MaB World Network; follow the activities and projects promoted by the Biosphere Reserve in the field of conservation, monitoring, development, environmental sustainability education; consult publications, itineraries and routes within the Reserve; access the documents of the application path to the Biosphere Reserve; consult the map of the Reserve; obtain information about events, products, accommodation facilities of the territory; consult the Reserve programme.

IS (WILL) THERE (BE) AN ELECTRONIC NEWSLETTER? IF YES, HOW OFTEN WILL IT BE PUBLISHED?

The news on the candidature procedure of the Tuscan-Emilian Apennines were sent during the candidature and right after its designation to all the registered subscribers to the National Park newsletter which counted more than 1,100 registered users.

Currently the newsletter is no longer active and there are no reference newsletters on the official website of the Biosphere Reserve. However, the news can be consulted in the "Reserve Programme" section on the official website and on the Facebook page related to the Appennino Tosco-Emiliano Reserve.

DOES (WILL) THE BIOSPHERE RESERVE BELONG TO A SOCIAL NETWORK (FACEBOOK, TWITTER, ETC.)?

In addition to the website, the Biosphere Reserve is also present on the social networks:

Facebook (https://www.facebook.com/Biosfera-Appennino-446429535688528/) its "Apennine Biosphere" has counted 2825 "like" and 2910 followers up to 21st May 2019.

The presence of a public group always on Facebook is also highlighted: MATE (Appennino Tosco-Emiliano MaB), which was created spontaneously. The "MATE" group (https://www.facebook.com/groups/364452647361122) was created in January 2018 with the aim of "networking among the inhabitants of our Biosphere Reserve to best experience it through the organisation of events, activities, meetings or simply through the sharing of ideas."

17. GOVERNANCE, BIOSPHERE RESERVE MANAGEMENT AND COORDINATION

17.1. MANAGEMENT AND COORDINATION STRUCTURE

WHAT IS THE LEGAL STATUS OF THE BIOSPHERE RESERVE?

The biosphere reserve is not a legal entity. It is an entity de facto defined by UNESCO designation and by agreements and cooperation among the various areas and Bodies promoting and composing the reserve.

WHAT IS THE LEGAL STATUS OF THE CORE AREA(S) AND THE BUFFER ZONE(S)?

The Core areas hold the status of National Park, Regional Park and Regional reserve areas. The Buffer zones do not hold a specific legal status. Most of them hold the status of National Park and Regional Park territory, the others hold statuses connected with Community nature protection (SCI and SPA), governed by the Galasso law (transposed in the code of environmental and cultural heritage., as well as the regional and provincial Territorial Coordination Plans).

WHICH ADMINISTRATIVE AUTHORITIES HAVE COMPETENCE FOR EACH ZONE OF THE BIOSPHERE RESERVE (CORE AREA(S), BUFFER ZONE(S), TRANSITION AREA(S))?

There is no direct relationship between the perimeter of the Core areas, Buffer zones and Transition areas and the boundaries of the local and regional administrative authorities. The Italian State has competence over the whole Reserve; subsequently, each Region (Emilia-Romagna for the Northern side of the Apennine Ridge, Tuscany and Liguria for the Southern side) and each of the 6 Provinces (Parma, Reggio Emilia, Modena, Lucca, Massa-Carrara, La Spezia) have competence over their own portions of territory).

The Appennino Tosco-Emiliano National Park and the Municipalities on which the Core areas are located have competence over the latter, that is to say:

- As regards the Monte Sillara Core Area: the Municipalities of Comano (Massa-Carrara), Licciana Nardi (Massa-Carrara), Bagnone (Massa-Carrara), Monchio delle Corti (Parma), Corniglio (Parma)
- As regards the Alpe di Succiso Core Area: the Municipalities of Ventasso, Comano (Massa-Carrara),
- As regards the Cima Belfiore Core Area: the Municipalities of Giuncugnano (Lucca), Fivizzano (Massa-Carrara), Ventasso (Reggio Emilia)
- As regards the Monte Cusna Core Area: the Municipalities of Ventasso (Reggio Emilia), Villa Minozzo (Reggio Emilia), Villacollamendina (Lucca), San Romano in Garfagnana (Lucca)

- As regards the Monte Ventasso Core Area: the Municipality of Ventasso (Reggio Emilia)
- As regards the Pietra di Bismantova Core Area: the Municipality of Castelnovo ne' Monti (Reggio Emilia)

The Body for the Management of Parks and Biodiversity in Central Emilia and the Municipalities on which the areas are located have competence over the following Core areas:

- As regards the Monte Giovo Core area: the Parco Regionale del Frignano and the Municipality of Pievepelago (Modena)
- As regards the Monte Cimone Core area: the Parco Regionale del Frignano and the Municipalities of Fiumalbo and Fanano (Modena)
- As regards the Sassi di Roccamalatina Core area: the Parco Regionale dei Sassi di Roccamalatina and the Municipality of Guiglia (Modena)
- As regards the Rupe di Campotrera Core area: Riserva Regionale Rupe di Campotrera and the Municipality of Canossa

The Body for the Management of Parks and Biodiversity in West Emilia and the Municipalities on which the areas are located have competence over the following Core areas:

- As regards the Taro Core area: Parco Regionale del Taro and the Municipalities of Collecchio, Fornovo di Taro, Medesano and Parma
- As regards the Boschi di Carrega Core area: the Parco Regionale Boschi di Carrega and the Municipalities of Sala Baganza and Collecchio
- As regards the Prinzera Core area: the Riserva Regionale di Monte Prinzera and the Municipalities of Fornovo di Taro and Terenzo

The Appennino Tosco-Emiliano National Park, the Bodies for the Management of Parks and Biodiversity in Central and West Emilia and the Municipalities on which the Buffer Zone is located have competence over the latter, that is to say:

In the Province of Modena: Municipality of Fanano, Municipality of Fiumalbo, Municipality of Frassinoro, Municipality of Guiglia, Municipality of Marano sul Panaro, Municipality of Pievepelago, Municipality of Sestola

In the Province of Reggio Emilia: Municipality of Castelnovo ne' Monti, Municipality of Ventasso, Municipality of Villa Minozzo, Municipality of Canossa, Municipality of Casina.

In the Province of Parma: Municipality of Corniglio, Municipality of Monchio delle Corti, Municipality of Tizzano, Municipality of Corniglio, Municipality of Palanzano, Municipality of Terenzo, Municipality of Fornovo di Taro, Municipality of Medesano, Municipality of Noceto, Municipality of Collecchio, Municipality of Sala Baganza.

In the Province of Massa Carrara: Municipality of Bagnone, Municipality of Casola in Lunigiana, Municipality of Comano, Municipality of Filattiera, Municipality of Fivizzano, Municipality of Licciana Nardi, Municipality of Villa Collemandina

In the Province of Lucca: Municipality of Sillano Giuncugnano, Municipality of Piazza al Serchio, Municipality of Pieve Fosciana, Municipality of Fosciandora, Municipality of San Romano in Garfagnana, Municipality of Villa Collemandina

The Appennino Tosco-Emiliano National Park, the Bodies for the Management of Parks and Biodiversity in Central and West Emilia and all the Municipalities concerned by the Reserve and of the extension proposal have competence over the Transition Area.

CLARIFY THE RESPECTIVE COMPETENCE OF EACH OF THESE AUTHORITIES. MAKE A DISTINCTION BETWEEN EACH ZONE IF NECESSARY AND MENTION ANY DECENTRALIZED AUTHORITY.

The three Regions of Tuscany, Emilia-Romagna and Liguria and, by proxy, the six provinces (Parma, Reggio Emilia, Modena, Lucca, Massa-Carrara, La Spezia) have competence over the whole Biosphere Reserve, each of them for their own territory, as regards the definition of policies and general guidelines through planning and legislative requirements. The main plans and programmes on a regional and provincial level, in force on the territory of the Appennino Tosco-Emiliano MaB Reserve, are:

- the Regional Territorial Plan (PTR Piano Territoriale Regionale) of the Regions of Emilia-Romagna and Tuscany
- the Regional Landscape Territorial Plan (PTPR Piano Territoriale Paesistico Regionale) of the Region of Emilia-Romagna
- the Territorial Guideline Plan (PIT Piano di Indirizzo Territoriale) – acting as Landscape Plan – of the Region of Tuscany
- The Territorial Coordination Landscape Plan (PTCP Piano territoriale di coordinamento paesistico of the Liguria region
- the Provincial Coordination Territorial Plan (PTCP Piano Territoriale di Coordinamento Provinciale) of the Provinces of Modena, Reggio Emilia and Parma
- the Coordination Territorial Plan (PTC Piano Territoriale di Coordinamento) of the Provinces of Massa-Carrara and Lucca
- the Provincial Coordination Territorial Plan (PTCP Piano Territoriale di Coordinamento Provinciale) of the Province of La Spezia

The Municipalities are competent for the implementation of general rules and guidelines of a higher level, and for the definition of urban and development scenarios within the municipality boundaries. Each municipality has its own town development plan.

The National Park and the Regional Parks are fully competent for environmental protection and biodiversity conservation, and are also competent for sustainable development policies, which they regulate through their planning and protection measures. As far as the Appennino Tosco-Emiliano MaB Reserve is concerned, the National Park and the Bodies for the Management of Parks and Biodiversity in Central and West Emilia performs conservation functions, in particular in the Core Areas and Buffer zones and development functions, mainly in the Transition Areas

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INDICATE THE MAIN LAND TENURE (OWNERSHIP) FOR EACH ZONE.

There is no complete mapping of the area defining public and private ownership. However, it is possible to make a satisfactory rough assessment.

In the Core Areas most territories are State-owned or characterised by "rights of common" ("usi civici"*) and only to a limited extent private. In the Buffer Zones, and even more so in the Transition Areas, this ratio is inverted and, as you move down towards the valley, private areas outnumber public areas and areas characterised by "rights of common", which are nevertheless present in the entire territory.

IS THERE A SINGLE MANAGER/COORDINATOR OF THE BIOSPHERE RESERVE OR ARE SEVERAL PEOPLE IN CHARGE OF MANAGING IT? IF ONE MANAGER/ COORDINATOR, WHO DESIGNATES AND EMPLOYS HIM/HER (NATIONAL AUTHORITIES, ENVIRONMENTAL ADMINISTRATIVE AGENCY, LOCAL AUTHORITIES)?

The Appennino Tosco-Emiliano Biosphere Reserve has a single coordinator: the Chairperson of the Appennino Tosco-Emiliano National Park Authority (the promoter of the candidature).

The Appennino Tosco-Emiliano National Park is confirmed as coordinator of the Appennino Tosco-Biosphere reserve also after the extension since:

- The National Park stretches on the sides of the Biosphere Reserve (Emilia and Tuscany-Liguria) and, more than any other Body, can construe and express the combined vision of the different territories
- As far as the covered area is concerned, most of the Core Areas of the Biosphere Reserve of the Appennino Tosco-Emiliano are part of the National Park managing its conservation;
- The Appennino Tosco-Emiliano National Park is a definite entity, whose life is guaranteed by the State and by Italian Laws, provided with facilities, staff and an independent budget which ensure the administration and operating management of the Biosphere Reserve.
- Being a National institution, it can easily dialogue with Regional, Provincial, and Municipal Authorities but also with the competent Ministries and the National MaB Committee.
- the function of coordinator of the Biosphere Reserve, in these first years of activity (from 2015 to today) has been correctly carried out;

However, by virtue of such a substantial extension, the coordination function of the Biosphere Reserve will have to be carried out by the National Park with the collaboration and agreement of the Emilia-Romagna and Tuscany Regions, which will be able to bring to the Biosphere Reserve the authority that derives from their decision-making, legislative and operational capacity on the territories.

* *The term "rights of common" ("usi civici") defines a right of enjoyment of immovables under various forms (hunting, pasture, estovers, sowing) to which the members of a community are entitled, on land which is owned by the municipality or by a third party. This right does not derive from a formal law but is rooted in common practice.*

The coordination and management of the Biosphere Reserve will therefore be carried out by a body called "Control Room of the Biosphere Reserve", which is not present in the current governance structure.

The Chairperson of the Appennino Tosco-Emiliano National Park, as coordinator of the Biosphere Reserve, is the head of the "Permanent Consultative Assembly" (the body through which all the local stakeholders of the whole Reserve can take part in the choices and decisions concerning the Reserve, whose functions and operating modes are described in par. 17.1.7).

The Control Room interfaces with the "Territorial Committees for Management", bodies that adapt and develop the current Management Committee in place (chapter 17.1.8).

A technical body, called "Appennino Tosco-Emiliano MaB Office" - already active and operational since the first days after designation as a Biosphere Reserve in 2015 - consisting of personnel from the National Park, Regional Parks, Regions and professionals specifically appointed and coordinated by the Director of the National Park of the Tuscan-Emilian Apennines.

The MaB Office's main task is supporting the Coordinator of the Reserve in the management of the relations with and between the Control Room the Permanent Consultative Assembly and the Management Territorial committees for which he/she will be in charge of the administration and of the minutes of the meetings dealing with communication and information concerning the Biosphere Reserve, addressing both local communities and the outside world and supporting the implementation of the Action Plan and its monitoring.

The official headquarters of the Appennino Tosco-Emiliano Biosphere Reserve, to which we will refer, correspond to the headquarters of the Appennino Tosco-Emiliano National Park, located at 23 via Comunale, 54010 Sassalbo di Fivizzano (Massa-Carrara), Italy.

ARE THERE CONSULTATIVE ADVISORY OR DECISION-MAKING BODIES (E.G., SCIENTIFIC COUNCIL, GENERAL ASSEMBLY OF INHABITANTS OF THE RESERVE) FOR EACH ZONE OR FOR THE WHOLE BIOSPHERE RESERVE?

A single body, called the "Permanent Consultative Assembly" has been set up for the whole Appennino Tosco-Emiliano Biosphere Reserve (Core Areas, Buffer Zones and Transition Areas). This body has consultative, participatory and representational functions for the Reserve's Local Communities and stakeholders and serves as an incentive for the management of the Biosphere Reserve

The "Permanent Consultative Assembly" is convened at itinerant locations in the territory of the Biosphere Reserve or in neighbouring areas, at least once a year (February 19), or in any case whenever the participants request it.

The "Permanent Consultative Assembly" of the Biosphere Reserve of the Appennino Tosco-Emiliano has met 4 times so far with the following purposes:

- February 19, 2017, Reggio Emilia (RE): constitution of the Assembly, presentation of the Management Committee, awareness of the first projects and actions of the Biosphere Reserve
- 19 February 2018, Parma (PR): approval of the I CARE APPENNINO branding strategy, collection of addresses for Action Plan

- 19 February 2019 Fivizzano (MS): approval of the Action Plan draft, establishment of thematic work groups, delivery of the first "I CARE APPENNINO" awards
- February 19, 2020 Parma: first Action Plan implementation report and presentation of the extension proposal

Starting from the meeting of the Consultative Assembly in 2019, participatory working groups have also been activated, each dedicated to a theme or project of the Biosphere Reserve and aimed at involving interested stakeholders in their development.

The "Permanent Consultative Assembly" of the Appennino Tosco-Emiliano MaB Reserve is currently composed as follows (on a voluntary, unpaid basis):

- representatives of the Municipalities, Unions of Municipalities, Provinces and Regions whose territories are included in the area of the Appennino Tosco-Emiliano Biosphere Reserve;
- representatives of the entities managing all the protected areas, SCIs and SPAs whose territories are included in the area of the Appennino Tosco-Emiliano Biosphere Reserve;
- representatives of all Chambers of Commerce, Industry, Crafts and Agriculture operating in the area of the Appennino Tosco-Emiliano Biosphere Reserve;
- representatives of the Corps of Carabinieri having jurisdiction over the area of the Appennino Tosco-Emiliano Biosphere Reserve;
- representatives of the Reclamation Consortiums whose territories are included in the area of the Appennino Tosco-Emiliano Biosphere Reserve;
- representatives of Local Action Groups (LAGs), i.e. the entities managing the European Funds for Rural Development having jurisdiction over the area of the Appennino Tosco-Emiliano Biosphere Reserve;
- representatives of all Universities and Research Institutes operating in the area of the Appennino Tosco-Emiliano Biosphere Reserve;
- the heads of primary and secondary schools present in the area of the Appennino Tosco-Emiliano Biosphere Reserve;
- representatives of the main business and cooperative associations (Professional Associations, PDO and PGI Protection Consortiums, Tourist Consortiums, etc.) operating in the area of the Appennino Tosco-Emiliano Biosphere Reserve;
- representatives of the main environmental, cultural, youth and recreational associations (WWF, Legambiente, Lipu, CAI, UISP, ARCI, CSI, etc.) and citizens' committees present and operating in the area of the Appennino Tosco-Emiliano Biosphere Reserve;
- the following bodies which applied to be part of it: B&B Woodly; La Tavola del Contado; Legacoop Emilia Ovest; Confartigianato imprese; Gente di Canile; Istituto comprensivo Neviano degli Arduini; Strada del Prosciutto; CCIAA Reggio Emilia: CCIAA Parma: Club UNESCO Modena; Ass Cult Ilde (i libri de.); IIS Cattaneo - Dall'Aglio; IIS Nelson Mandela; GAL Antico Frignano and Appennino Reggiano; Consigliere Emilia Romagna; Legambiente Appennino Reggiano; Raggruppamento GGEV Reggio Emilia; Coop Il Ginepro; Istituto comprensivo Camporgiano; CAI Reggio Emilia; Confcooperative Reggio Emilia; Istituto comprensivo Castiglione Garfagnana; Istituto Comprensivo

Corniglio; Istituto Comprensivo Licciana Nardi; I Groppi Comitato di Camporaghena e Torsana; Montecaio srl; Al.Da.Sas; CAI Parma; Consorzio Bonifica Emilia Centrale; Club UNESCO Carrara; Istituto Comprensivo Villafranca Lunigiana; Az Agr Campelli; Centro Studi Montesporno; Az Agr Dama Dairy; Fondazione Andrea Borri; Fondazione Enaip Don G. Magnani; CIA Toscana Nord; CNA Reggio Emilia; IIC Pacinotti; CAI Nazionale Milano; Studio Di Martino e Associati; Club UNESCO Reggio Emilia; Archeovea Impresa culturale srl; Promoting committee l'UNESCO Carpineti; Scaminati di Sassalbo; Effetto Notte; Istituto Cervi; Farfalle in Cammino; Sigeric; Ass GAE Valtaro e Valceno.

Considering the good operation of the body, the "Permanent Consultative Assembly" will be confirmed also after the extension of the Biosphere Reserve, by extending the involvement to stakeholders of the incoming territories. A single permanent Consultative Assembly for the whole Biosphere Reserve is indeed necessary to ensure unity of direction for its actions.

HAS A COORDINATION STRUCTURE BEEN ESTABLISHED SPECIFICALLY FOR THE BIOSPHERE RESERVE?

The coordination and operating management of the whole Appennino Tosco-Emiliano Biosphere Reserve (Core Areas, Buffer Zones and Transition Areas) is assigned to the Management Committee, a body which has been specifically conceived for the Biosphere Reserve and which has set up only after designation

Since recognition, the Management Committee has met several times, in itinerant locations, and, supported by the Appennino Tosco-Emiliano MaB Office, has drawn up the branding strategy and the Action Plan in line with the guidelines received from the Permanent Consultative Assembly.

However, the Management Committee appeared to have difficulty in expressing the complex territorial articulations of the Biosphere Reserve, which are not only "administrative elements", but also and above all evidence of very different cultural, historical and environmental identities. These difficulties would be further accentuated as a result of the extension, which expands the Biosphere Reserve not only in terms of surface, but also, precisely, of distinct territorial identities.

Therefore, the proposal is that the current Management Committee be divided into "5 territorial committees for the management of the Biosphere Reserve" based on the participation and involvement of local actors from Lunigiana, Garfagnana, Modena Apennines, Parma Apennines and Reggio Apennines.

These "territorial committees for management" must be composed of approximately 5 to 10 subjects, from their own territory, representing Local Authorities, the Bodies responsible for environmental conservation, the world of scientific research and innovation, the socio -economic fabric, the world of education and culture. Each territorial committee will identify a coordinator who will also have the task of interfacing periodically with the members of the Control Room.

The Territorial Management Committees are to be considered bodies with relative autonomy, as their members, in pursuing the objectives of the Biosphere Reserve and the UNESCO MaB program will report to the mandates and prerogatives of the bodies of the authorities they represent on a voluntary and unpaid basis.

HOW IS THE MANAGEMENT/COORDINATION ADAPTED TO THE LOCAL SITUATION?

The Governance structure of the Biosphere Reserve, developed in the first few years that have passed since designation, has proved to be overall effective, the proposed changes will make it further suitable for the local situation and for significant extension. The coordination of the Biosphere Reserve led by a Control Room composed of the Apennine National Park (which remains the coordinating body) and the Emilia Romagna and Tuscany Regions and the establishment of "territorial management committees" will allow to strengthen the governance of the Appennino Tosco-Emiliano Biosphere Reserve that will be more and more similar to a collaboration pact between various public bodies and private bodies.

IS THERE A PROCEDURE FOR EVALUATING AND MONITORING THE EFFECTIVENESS OF THE MANAGEMENT?

One of the tasks of the "Permanent Consultative Assembly" (cf. 17.1.7) is to regularly monitor and assess the effectiveness of the management of the Biosphere Reserve and the Implementation of its Action Plan

Should the Permanent Consultative Assembly express dissatisfaction with the Management of the Biosphere Reserve, it will be entitled to request that the coordinator of the Assembly proposes a new composition and/or new governance in order to make it more effective

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17.2. CONFLICTS WITHIN THE BIOSPHERE RESERVE:

DESCRIBE ANY IMPORTANT CONFLICTS REGARDING THE ACCESS OR THE USE OF NATURAL RESOURCES IN THE AREA CONSIDERED (AND PRECISE PERIOD IF ACCURATE). IF THE BIOSPHERE RESERVE HAS CONTRIBUTED TO PREVENTING OR RESOLVING SOME OF THESE CONFLICTS, EXPLAIN WHAT HAS BEEN RESOLVED OR PREVENTED, AND HOW THIS WAS ACHIEVED FOR EACH ZONE.

Since the drafting of the first candidature dossier (2014) to date, no new conflicts concerning the use or access to natural resources have developed on the territory of the Biosphere Reserve, nor in those that intend to enter it, nor those previously described have been solved.

Among the issues generating conflicts, the following should be highlighted:

- The Apennine area of the Reserve is one of the Italian areas with the highest hydrogeological instability, with over 20% of hill and mountain

areas affected by active or dormant landslides on the Northern side, characterised mainly by clayey formations, and with problems resulting from extremely intense rain events on the Southern side. The reduction in the agricultural activity and in the energy introduced into natural systems by man causes slopes to be weaker and, in some cases, changes - including radical ones- in the landscape.

- New requests for exploitation and concession of water resources for energy purposes (mainly small hydro). Dealing with requests for concession for the use of wind energy near ridges and passes, as well as requests for the installation of photovoltaic systems on farmland, is also a problem.
- The renewed presence of wolves has raised significant management problems, mainly connected with the predation of domestic cattle and the widespread perception of this species as dangerous, which often derives from "non-educated/non-informed" popular hearsay.
- The generalised and significant increase in wildlife damages agriculture and makes it difficult to have successful, quality crops.
- Climate change has caused critical events, up to now localised, such as those connected with an increased intensity of phenomena (intensity of precipitation, prolonged dry spells, etc.) with subsequent changes in natural and anthropic systems.
- The MAB area is characterised by opposite demographic trends: density decrease in the higher municipalities and density increase in the lower ones.
- Another conflict which has emerged among the population is the fact that some tourist and hiking areas of great environmental value are being accessed by off-road vehicles (motorbikes, quads, cars), the use of which is growing continuously.

IF THERE ARE ANY CONFLICTS IN COMPETENCE AMONG THE DIFFERENT ADMINISTRATIVE AUTHORITIES IN THE MANAGEMENT OF THE BIOSPHERE RESERVE, DESCRIBE THESE.

There are no conflicts or issued between the administrative authorities that are part of the Biosphere Reserve and neither between - or with - those who wish to enter it. It can definitely be stated that the work of the Biosphere Reserve in recent years has effectively served as a bonding and aggregating element between administrations, often favoring the desire to collaborate and develop projects in synergy even between administrations that were not used to do it (ERDF ROP project, Internal Areas projects)..

EXPLAIN THE MEANS USED TO RESOLVE THESE CONFLICTS, AND THEIR EFFECTIVENESS.

The administrative authorities that have the essential competences on the territory of the reserve are: National Park of the Tuscan - Emilian Apennines; Emilia Romagna region; Tuscany region; Macro-areas for Parks and Biodiversity; Local Councils and their Unions.

The presence of the Reserve, with its own governance system providing for the involvement of the territorial representatives in the management, development and protection tools, allows an efficient and more comprehensive and consistent management of issues which are currently leading to an overlapping of

administrative competences. This applies in particular to the preliminary, decision-making and control phases of authorization procedures or to specific issues such as the management of the conflictual relationship originated by the simultaneous presence over the territory of ungulates, hunting, and agriculture and of livestock rearing activities and wolves, issues which cannot be confined within the administrative boundaries of each institution. Therefore, the Reserve, with the said governance system, allows better management of border situations, implementing procedural simplifications and increasing the effectiveness of the decision-making action of institutions.

In order to overcome the interference due to cases of partial overlapping of administrative competences (which, among others, is in the process of being amended at the national legislative level), within the Reserve Management Committee, it will be possible to implement a connection and simplification action on issues that are of interest for several bodies and neighbouring administrative districts; one such case, already tested, is the setting up of the Wolf Apennine Center (hereinafter referred to as WAC) within the National Park of the Tuscan-Emilian Apennines.

17.3. REPRESENTATION, PARTICIPATION AND CONSULTATION OF LOCAL COMMUNITIES

AT WHAT STAGES IN THE EXISTENCE OF A BIOSPHERE RESERVE HAVE LOCAL PEOPLE BEEN INVOLVED: DESIGN OF THE BIOSPHERE RESERVE, DRAWING UP OF THE MANAGEMENT/COOPERATION PLAN, IMPLEMENTATION OF THE PLAN, DAY TO DAY MANAGEMENT OF THE BIOSPHERE RESERVE? GIVE SOME SPECIFIC EXAMPLES.

The path taken by the Entities and the communities of the Tuscan-Emilian Apennines to achieve designation as a UNESCO Biosphere Reserve in 2015 can be described as a long process of involvement and participation of all stakeholders. From 2015 until today, the Reserve has interfaced generously, at all levels, with different types of stakeholders, formal and informal. In particular the examples worth mentioning are:

- The branding strategy "I CARE APPENNINO" whose purpose is to stimulate and involve companies and associations in the area (and beyond) to take on projects in support of the territory and communities of the Biosphere Reserve with a view to corporate social responsibility.
- The action plan, which does not only provide for the involvement and responsibility of a plurality of players in all of the abovementioned projects, but which is also "open" so that proposals to supplement it can continuously be suggested by all stakeholders.

Relations and involvement have multiplied locally, within the area that has become a Biosphere Reserve, at a national level (ministerial relations and with other Italian Biosphere Reserves) and internationally through the Network of Biosphere Reserves and the opportunities offered by the UNESCO's MaB Programme.

In the territories bordering the Biosphere Reserve, today making the object of the extension application, there have been many actions involving both administrations and stakeholders in concrete projects promoted and supported by the Biosphere Reserve (e.g. school education projects, MEL project, projects for young people). With this respect, the stakeholders of the "incoming territories" have always been considered as if they were already part of the Biosphere Reserve, after proving to share the objectives and actions for sustainable development. However, this active involvement did not translate into evident and easily accountable actions such as public meetings or endorsement letters.

DESCRIBE HOW THE LOCAL PEOPLE (INCLUDING WOMEN AND INDIGENOUS COMMUNITIES) HAVE BEEN, AND/OR ARE REPRESENTED IN THE PLANNING AND MANAGEMENT OF THE BIOSPHERE RESERVE (E.G., ASSEMBLY OF REPRESENTATIVES, CONSULTATIVE GROUPS).

The structured governance model for the management of the Tuscan-Emilian Apennines Biosphere Reserve provides for a specific, large-scale body (the Permanent Consultative Assembly) aimed at representing and involving local communities, with no distinctions, in the planning and management of the Reserve. Many projects which are currently underway primarily or secondarily target local people aggregation and motivation (workshops, exchanges between students, international conferences, courses, conferences, excursions, convivial moments, meetings).

DESCRIBE THE SPECIFIC SITUATION OF YOUNG PEOPLE IN THE PROPOSED BIOSPHERE RESERVE (E.G., POTENTIAL IMPACTS OF THE BIOSPHERE RESERVE ON YOUTH, CONSIDERATION OF THEIR INTERESTS AND NEEDS, INCENTIVES TO ENCOURAGE THEM TO PARTICIPATE ACTIVELY IN THE GOVERNANCE SYSTEM OF THE BIOSPHERE RESERVE).

The situation which had been described in this same paragraph in the previous nomination dossier (attached) has not substantially changed. The Biosphere Reserve supports and promotes projects proposed by the young people of its own territory, who have also joined into an informal group called MATE (MaB Appennino Tosco-Emiliano), making the most of the momentum gained through the UNESCO's 1st MaB Youth Forum – a world forum held in September 2018 in the Biosphere Reserve of the Po Delta attended by a large delegation of young people from the Tuscan-Emilian Apennines.

The MATE Group was born following the participation of 15 delegates of the Biosphere Reserve to the UNESCO's 1st MaB Youth Forum. With a view to giving continuity to that experience, throughout 2018, it held some awareness-raising meetings in the area aimed especially at young citizens so that they could get to know the great potential of their Biosphere Reserve. The MATE group now intends to propose itself as coordinator of local community centres represented by young citizens properly trained on the Biosphere Reserve and acting as collectors of ideas, proposals, projects to be put online, facilitating their implementation, in compliance with the founding principles of the UNESCO's MaB Programme.

WHAT FORM DOES THIS REPRESENTATION TAKE (E.G., COMPANIES, ASSOCIATIONS, ENVIRONMENTAL ASSOCIATIONS, TRADE UNIONS)?

The governance structure, the branding strategy and the Action Plan are the ways in which the Biosphere Reserve realizes the participation and representation of all its stakeholders.

ARE THERE PROCEDURES FOR INTEGRATING THE REPRESENTATIVE BODY OF LOCAL COMMUNITIES (E.G., FINANCIAL, ELECTION OF REPRESENTATIVES, TRADITIONAL AUTHORITIES)?

Both in the "Permanent Consultative Assembly" (see paragraph 17.1.7) and in the "Territorial Management Committee" (see paragraph 17.1.8), there are both representatives of the Local Authorities (and in particular the Municipalities, as the main democratic institution for the representation of local communities provided for by the Italian Constitution) and the main business, environmental, cultural and recreational associations operating in the Biosphere Reserve. The same will happen, after extension, for local institutions and stakeholders of the incoming territories.

HOW LONG-LIVED ARE CONSULTATION MECHANISMS (PERMANENT ASSEMBLY, CONSULTATION ON SPECIFIC PROJECTS)? MAKE A COMPLETE DESCRIPTION OF THIS CONSULTATION. WHAT ARE THE ROLES OF INVOLVED STAKEHOLDERS COMPARED TO THE ROLE OF THE BIOSPHERE RESERVE?

Within the governance of the MaB Reserve, the consultation, participation and representation function of local communities and stakeholders is assigned to the "Permanent Consultative Assembly" (cf. 17.1.7). This body will be set up after obtaining the designation; it will be permanent, i.e. it will have no fixed term and the parties composing it will not be renewed (authorities, bodies, associations, etc.). However, the latter must, by law, regularly renew their representational bodies, which means that the Reserve's Permanent Consultative Assembly will also have to renew its participants periodically.

The Permanent Consultative Assembly will not only be involved in specific projects but it will also be entitled to give instructions relating to the overall management of the Appennino Tosco-Emiliano MaB Reserve. The "Permanent Consultative Assembly" will be coordinated by the Chairperson of the Appennino Tosco-Emiliano National Park who, supported by the "MaB Office", will convene the Assembly at least once a year, or whenever at least 1/4 of the parties entitled to take part in it will request it.

The stakeholders involved in the Management Committee have different roles with regard to the main functions of the Biosphere Reserve but they all represent, in different ways, the local communities. Some of them are mainly competent for the management of the territory and the representation of local communities (Regions, Provinces, Unions and Municipalities), others for environmental and biodiversity conservation (Park Authorities, State Forestry Corps, Environmental Associations); others for educational/training functions (Universities, Educational Institutes, Research Bodies) and others for economic

and social development issues (CCIAAs, Local Action Groups, Professional Associations, Consortiums, Cultural/Recreational Associations).

WHAT CONSULTATION MECHANISMS HAVE BEEN USED, AND WHO HAS BEEN INVOLVED? ARE THEY FOR SPECIFIC PURPOSES OR LONG-TERM? WHAT IMPACTS HAVE THEY HAD ON DECISION-MAKING PROCESSES (DECISIONAL, CONSULTATIVE OR MERELY TO INFORM THE POPULATION)?

As extensively described in paragraph 17.1.7, the "Permanent Consultative Assembly" comprises all the main stakeholders in the area, who participate in this body permanently and by internally replacing their representatives going through a democratic process.

The role of the "Permanent Consultative Assembly" is central to the governance model conceived for the Tuscan-Emilian Apennines MaB Reserve, therefore it does not only play an informative role for the local communities, but above all it acts as a motivator for the Management Committee (coordination and operational management body of the Reserve, whose functions and operating modes are described in paragraph 17.1.8) by providing indications for the drafting of the Reserve Management Program (see chapter 17.4), soliciting and promoting its implementation, verifying and evaluating its results and requesting its periodical update.

The Permanent Consultative Assembly is also called, once a year, to assess the management of the Reserve by the Management Committee. The indications and decisions of the "Permanent Consultative Assembly" will be recorded (by the MaB Office, see paragraph. 17.1.6), made public and provided to the "Management Committee".

DO WOMEN PARTICIPATE IN COMMUNITY ORGANIZATIONS AND DECISION-MAKING PROCESSES? ARE THEIR INTERESTS AND NEEDS GIVEN EQUAL CONSIDERATION? WHAT INCENTIVES OR PROGRAMMES ARE IN PLACE TO ENCOURAGE THEIR REPRESENTATION AND PARTICIPATION (E.G.: WAS(WERE) A "GENDER IMPACT ASSESSMENT(S)" CARRIED OUT)?

Women's participation in the governance bodies of the Reserve is not guaranteed through specific programmes (see par. 17.1.7 and 17.1.8) because in Italy there is no evidence of a different level of involvement of men and women in the institutional and association world.

17.4. THE MANAGEMENT/COOPERATION PLAN/POLICY:

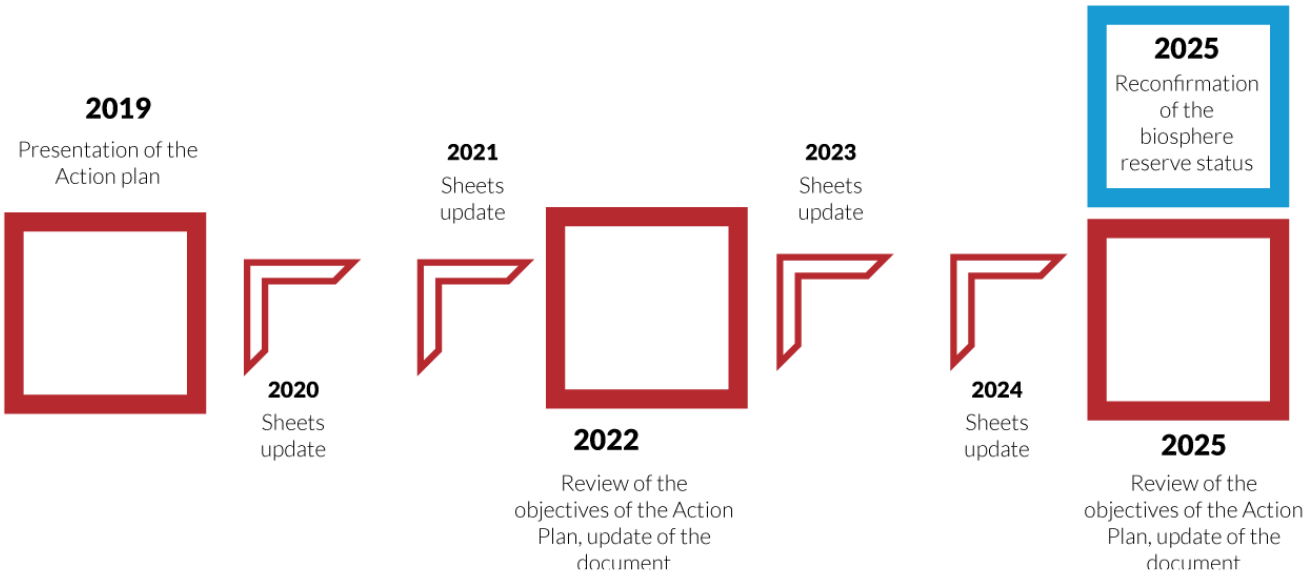
IS THERE A MANAGEMENT/COOPERATION PLAN/POLICY FOR THE BIOSPHERE RESERVE AS A WHOLE?

On the occasion of the Third Annual Consultative Assembly (Fivizzano 19 February 2019) the first draft of the Action Plan of the Biosphere Reserve of the Tuscan-Emilian Apennines was presented (attached hereto in its final version), therefore on the occasion of the Consultative Assembly of 2020 (Parma 19 February 2020), a first update on its implementation was presented. This document is consistent and in continuity with the "guideline document", defined for the nomination process for the MaB Programme and already approved by all the Local Councils which are now part of the Biosphere Reserve.

The main focus of this Action Plan is to foster a process of culture, awareness and capacity building of human resources for the Apennines. The Action Plan must ensure that the designation as a UNESCO's MaB Reserve works as a concrete and effective spur for the communities of the Tuscan-Emilian Apennines, making them ready to take up the challenges of international competition.

The enhancement of human capital is the true raison d'être of this Action Plan, the strategic aim to counteract the now chronic critical issues of emigration and abandonment.

The Action Plan pursues the sustainable development objectives, both those specific to the Tuscan-Emilian Apennines aimed at enhancing existing opportunities, and the general ones indicated by the international community (17 UN Sustainable Development Goals) and targeted by the UNESCO's MaB Programme (Lima Action Plan).



- *Figure 17.2 - Chronoprogram of the Action Plan review activities*

In the three and a half years since UNESCO's designation, the Tuscan-Emilian Apennines Biosphere Reserve has dedicated its commitment to building governance and encouraging the involvement of local communities and stakeholders, trying to create a sense of belonging and responsibility. This Action Plan is now intended to help pursue with greater concreteness and commitment the main functions of a Biosphere Reserve:

- Conserving biodiversity, restoring and improving ecosystem services and promoting the sustainable use of natural resources.
- Contribute to the construction of sustainable, healthy and equitable societies, economies and human settlements, in full harmony with the biosphere.
- Facilitate biodiversity and the science of sustainability, education for sustainable development and the capacity building and strengthening in the area.

Further to this, there is also the need to promote mitigation and adaptation to climate change. Recent evidence of global warming and its tragic consequences have prompted the international community, UNESCO and all the Biosphere Reserves of the World Network to intensify their efforts in this direction. As a matter of fact, the singularity of the Tuscan-Emilian Apennines as a territory of climatic diversity and therefore an excellent observatory for climate change was already underlined in the nomination dossier.

The Action Plan aims to be a concrete plan and not a mere representation of aspirations for the future. Its contents are defined through a project/activity bank, thanks to the many collaborations that are already underway, in the start-up or in the advanced planning phase.

The Biosphere Reserve promotes and develops these projects within a territorial context that sees the presence of public bodies and private entities particularly active in the protection and promotion of the territory and therefore works in synergy with them, believing that - while respecting everyone's competencies - a strong connection is desirable in order to enhance the effectiveness and impact of these actions. In particular, this Action Plan works as a corollary in synergy with the Strategies of the internal areas "Reggio Apennines" and "Garfagnana - Lunigiana - Media Valle del Serchio - Pistoia Apennines" and with the Sustainable Energy Action Plans (SEAP) approved in the territories of the Reserve.

Each sheet in the Action Plan is constructed in such a way as to provide specific information regarding the project described, its contribution to the functions and objectives of the Biosphere Reserve and the UNESCO's MaB programme, the territorial area concerned and the participating subjects.

Once the extension completed, it will be possible to add project sheets that also concern the incoming territories..

WHICH ACTORS ARE INVOLVED IN PREPARING THE MANAGEMENT/ COOPERATION PLAN? HOW ARE THEY INVOLVED?

The Action Plan of the Tuscan-Emilian Apennine Biosphere Reserve is drawn up by the "MaB office", coordinated by the Management Committee (whose members and prerogatives are described in paragraph 17.1.8) upon input from the "Permanent Consultative Assembly" (whose members and prerogatives are described in par. 17.1.7), by revising and redrafting contributions and project sheets from many local stakeholders, both public and private.

DO LOCAL AUTHORITIES FORMALLY ADOPT THE MANAGEMENT/ COOPERATION PLAN? ARE LOCAL AUTHORITIES MAKING REFERENCE TO IT IN OTHER POLICIES AND/OR PLANS? IF SO, PLEASE PROVIDE DETAILS.

The Action Plan has not been and will not be formally adopted by local authorities, nor will they necessarily have to refer to it for their planning tools. Nonetheless, Local Authorities will be very involved and committed to the implementation of the project sheets that concern them directly and to encourage their communities to submit new projects to be included.

WHAT IS THE DURATION OF THE MANAGEMENT/COOPERATION PLAN? HOW OFTEN IS IT REVISED OR RENEGOTIATED?

The Action Plan proposal looks to 2025, the year in which the "Appennino Tosco Emiliano" Biosphere Reserve will be subject to the ten-year periodic review envisaged by the UNESCO's MaB Programme. This document must therefore always be considered open, a true work in progress, that can be, and will be, constantly integrated, welcoming in the future proposals to enrich and update the relevant project bank, by also including projects relating to the territories making the object of the extension.

DESCRIBE THE CONTENTS OF THE MANAGEMENT/COOPERATION PLAN. DOES IT CONSIST OF DETAILED MEASURES OR DETAILED GUIDELINES? GIVE SOME EXAMPLES OF MEASURES OR GUIDELINES ADVOCATED BY THE PLAN?

With regard to the conservation function, the specific objectives of the Action Plan of the "Tuscan-Emilian Apennines" Biosphere Reserve are:

C1 - Preserve and renew the historical balance between man and the biosphere in the Tuscan-Emilian Apennines, today threatened by man progressive abandonment, by climate change and cultural homologation; as a matter of fact, current naturalistic safeguards can only tackle these phenomena for specific sectors and without adopting a holistic approach.

C2 - Protect biodiversity, ecosystem functions, green infrastructures; keep under control the alien species whose presence tends to increase. These objectives are linked to the conservation of numerous habitats and species present (in particular the Habitats and species of Natura 2000 sites).

C3 – Defend and promote the numerous quality agro-food products, often niche products, (including the 64 PDO, PGI and traditional products classified by the Ministry of Agriculture) resulting from the high social and climatic diversity of the area. In some cases, these are real sociological archetypes, historically characterized by self-production and self-consumption, today threatened by the depopulation of mountainous areas and by the standardization of eating habits.

C4 - Protect social and cultural diversity, that is, material culture and the set of values and traditions linked to the deep secular relationship of the small communities of the Apennines with the land and the seasons. A relationship that has loosened over the decades of the growing economic, logistical and cultural subordination to the more inhabited, industrialized and urbanized areas north and south of the Biosphere Reserve. In this case, protection means contrasting ignorance and disaffection (by young people) and also overcoming

the mere nostalgia (by the elderly) of the past, through knowledge, enhancement and re-motivation of the human resources with respect to a future of high sustainability and quality of the relationship between man and the territory (biosphere) in the Apennines.

C5 - Counteract the hydrogeological instability which is largely a natural process, a dynamic component of the relationship between the geosphere, biosphere and anthroposphere, but which has in some cases been greatly amplified by the anthropic component (the abandonment of the use and capillary care of the lands by man which has characterized the last 50 years).

C6 - Monitor climate changes and the consequences they cause in a territory that borders two distinct climatic bands and is therefore particularly sensitive to recording the effects of global warming on mountain plant species. Monitoring is of particular significance for mitigation actions and for the initiation of a resilience process that involves the whole community.

With regard to the development function, the specific objectives of the "Tuscan-Emilian Apennines" Biosphere Reserve are:

S1 - Preserve and enhance the landscapes linked to traditional agro-forestry-pastoral activities, currently at risk of being neglected or abandoned, such as the forage crops on the hilly areas destined to the making of PDO Parmigiano Reggiano, the ridge pastures, the terraced lands in Lunigiana and Garfagnana. "Cultural landscapes" that underlie ecosystems that function in harmony with quality human activities; physical resources and good quality processes constituting natural capital to invest in for the future.

S2 - Support extensive and quality mountain agriculture. In agriculture, the recovery and protection of social and cultural diversity linked to the characteristics of the territory can counteract well-known phenomena in rural-marginal areas, such as: unemployment, young people disaffection, aging of the population, depopulation, fragility of the territory. Enhance socio-economic diversity understood as a pool of competencies therefore means: supporting endemic and quality productions (PDO, D.O.C.G., and PGI), organic farming and sustainable forestry; promoting agriculture multifunction character (in particular concerning the maintenance of the territory, the production of renewable energy and the offer of rural tourism); encouraging the processes of returning to micro-agriculture also with "new-heirloom" crops.

S3 - Promote sustainable tourism through the awareness of the importance of reducing and managing the environmental impacts of tourist flows, according to the principles of the European Charter for Sustainable Tourism in Protected Areas (ECST); promote the development of eco-tourism, nature tourism (also in relation to school tourism), trekking and hiking tourism (historical/religious routes and Alta Via dei Parchi hiking trail); increase attention with respect to the accessibility of the territory for a proper use, increase support for forms of Responsible Community Tourism; support innovation of the tourist offer all-year round and throughout the territory, and support the relationship between tourism and the agri-food sector.

S4 - Enhance culture and history: underlining the history of the intrinsic relationship between man and the biosphere through the signs and study of past eras, from the Stele Statues of Lunigiana to the traces of the Ligurian settlements, from the heritage of castles and parish churches dating back to the period of Matilda of Canossa, to the palazzi of the Malaspina, the Este, and the Vallisneri families, up to the "Maggio", to modern history, from the Risorgimento to the Resistance, until today.

With regard to the logistical support function (awareness raising, education, training, research), the specific objectives of the "Tuscan-Emilian Apennines" Biosphere Reserve are:

L1 - Study and monitor abiotic factors and biodiversity through the strengthening of the network of collaborations and memorandums of understanding with neighboring (but not only) universities in order to broaden the knowledge base and create a network that can give clear inputs to the protection and development function of the Biosphere Reserve. Encourage on site research, so that, thanks to innovation, operational paradigms used in this territory can be improved, especially in the spheres of infrastructure, communication, agriculture and tourism; investigate the aspects and build scenarios on the effects that anthropic pressures can generate on ecosystems, on rare species of both flora and fauna, as well as on the mechanisms connected to forestation. Particular emphasis will be given to monitoring the economic aspects of the Tuscan-Emilian Apennine territory with a particular focus on energy production, resource extraction, land use, tourism carrying capacity, ecological footprint and environmental accounting aimed at the definition of ecosystem services.

L2 - Educate to sustainability understood as educating to respect nature, but also to become increasingly knowledgeable about the vocations of the territory and therefore increasing affection for it in the future. This caters to the entire population and in particular to specific categories that are very important for the area and its activities, such as farmers and tour operators, further to traditional categories such as teachers and students. Education programs will also be extended beyond the boundaries of the Biosphere Reserve and aimed at the visitors who will stay there.

L3 - Strengthen and improve governance. Through an updated, authoritatively and widely shared unified vision, the Biosphere Reserve will be able to strengthen the coordination and interaction between the planning and programming actions provided for in the various existing territorial plans and programs, which are currently too fragmented and dispersive. The Biosphere Reserve will be an important tool to promote territorial cooperation between the two sides of the reserve territory and to open up to wider and international relations both at the institutional and non-institutional level.

INDICATE HOW THIS MANAGEMENT/COOPERATION ADDRESSES THE OBJECTIVES OF THE PROPOSED BIOSPHERE RESERVE (AS DESCRIBED IN SECTION 13.1).

Both the composition of the "Management Committee" (see paragraph 17.1.8) and the way in which the Action Plan was developed are designed to achieve the objectives of the Tuscan-Emilian Apennine Biosphere Reserve. In particular, four extremely competent and authoritative entities have been included in the Management Committee with respect to the objectives of conservation, development, research and environmental education of the Reserve:

- the National Park of the Tuscan-Emilian Apennines and the Management Body for Parks and Biodiversity of Western Emilia are the reference point for the achievement of the objectives of protection and conservation and operate within the Management Committee in close relationship also with the other entities managing Protected Areas included in the Biosphere Reserve of the Tuscan-Emilian Apennines. When the extension will be

completed, these entities will also be supported by the Management Body for Parks and Biodiversity of Central Emilia which is responsible for most of the incoming territories of the northern side of the Biosphere Reserve.

- the Chamber of Commerce, Industry, Crafts and Agriculture (CCIAA) of Parma, an autonomous body governed by public law that carries out functions of general interest for the businesses system, taking care of its development within the local economy. It is the reference point for the achievement of the sustainable socio-economic development objectives and it operates within the Management Committee in close relationship with the other Chambers of Commerce of the territory and all the trade associations and companies operating in the Tuscan-Emilian Apennines Biosphere Reserve. Once the extension will be completed, it will be appropriate to reserve to the Chambers of Commerce at least one more seat in the Management Committee so as to always include one Chamber of Commerce for each Region of the territory.
- the non-profit Reggio Children Foundation, a body responsible for disseminating and developing the Reggio Emilia Approach, and the University of Modena and Reggio Emilia. They are the reference point for the achievement of the objectives relating to the logistical support function. In particular, the Reggio Children Foundation mainly has the task of disseminating quality education and training, by operating within the Management Committee in close relationship with all the scholastic and educational institutions of the Tuscan-Emilian Apennines Biosphere Reserve and with its worldwide network of relationships.
- the Universities of Modena and Reggio Emilia and the University of Pisa (Sant'Anna) mainly take care of the research and monitoring functions and they will also work in close relationship with the other universities and research bodies operating in the area on the key subjects of the MaB programme and on the specific issues of the Tuscan-Emilian Apennines.
- the same criteria will also be applied to form the Territorial Committees for the management of the Biosphere Reserve which, in fact, will replace the Management Committee after the extension.

IS THE PLAN BINDING? IS IT BASED ON A CONSENSUS?

The Action Plan of the Tuscan-Emilian Apennines Biosphere Reserve is not binding, but it is considered as a cultural reference and "moral suasion" tool. The Institutions, Bodies and Associations that make up both the Permanent Consultative Assembly (see paragraph 17.1.7), and the Management Committee (see paragraph 17.1.8) by adhering to these bodies, within the limits of their possibilities and resources, are to commit to contribute to the implementation (or to facilitating the implementation) of the Action Plan.

The Action Plan is inspired and approved by a majority vote of the Permanent Consultative Assembly (see paragraph 17.4.1). The latter is a very broad and representative body of the socio-economic subjects operating on the territory (see paragraph 17.1.7), therefore the Action Plan is based on a broad consensus.

WHICH AUTHORITIES ARE IN CHARGE OF THE IMPLEMENTATION OF THE PLAN, ESPECIALLY IN THE BUFFER ZONE(S) AND THE TRANSITION AREA(S)? PLEASE PROVIDE EVIDENCE OF THE ROLE OF THESE AUTHORITIES.

The Action Plan, without particular distinctions between the Core, Buffer and Transition Areas, is made up by interventions and concrete actions whose individual implementation responsibility falls on one or more public and private stakeholders, both from the point of view of the main competences, and in relation to the resources necessary for implementation..

WHICH FACTORS IMPEDE OR HELP ITS IMPLEMENTATION (E.G.: RELUCTANCE OF LOCAL PEOPLE, CONFLICTS BETWEEN DIFFERENT LEVELS OF DECISION-MAKING).

At the moment there are no factors that could prevent or slow down the implementation of the Action Plan. On the contrary, given the enthusiasm with which it was accepted and the large number of subjects involved in its implementation and being responsible for one or more project sheets, it can be assumed that the Action Plan will be effectively implemented within the established deadlines. When the extension will be over, it will be possible to add project sheets that also concern the incoming territories.

IS THE BIOSPHERE RESERVE INTEGRATED IN REGIONAL/NATIONAL STRATEGIES? VICE VERSA, HOW ARE THE LOCAL/MUNICIPAL PLANS INTEGRATED IN THE PLANNING OF THE BIOSPHERE RESERVE?

The choice of the Appennino Tosco-Emiliano National Park, through its Chairperson, as the coordinator of the MaB Reserve (see par. 17.1.6) implies that the management of the Reserve is integrated in national strategies, in particular as regards safeguarding biodiversity, monitoring and research on environmental issues and the promotion of sustainable development. This is due to the fact that the National Park is a body which is directly connected with the Italian Ministry of the Environment. At the same time the National Park also cooperates with Regions (Emilia-Romagna and Tuscany, which approve its programmes) and Local Bodies (Regions, Provinces and Municipalities belonging to the Park Community), as well as entities managing European resources (Local Action Groups) and entities for local economic planning (Chambers of Commerce), agreeing on and integrating its strategies with these bodies.

INDICATE THE MAIN SOURCE OF THE FUNDING AND THE ESTIMATED YEARLY BUDGET.

The National Park with its own resources and thanks to contributions from the Regions and the Ministry of the Environment, guarantees the operational management availing itself of its headquarters, its staff and the MaB office of the Biosphere Reserve of the Tuscan-Emilian Apennines (see paragraph 17.1.6) which also deals with the information and communication concerning the Reserve.

The necessary resources for the management of the Reserve and for the implementation of the Action Plan, based on projects and programme agreements specifically defined and approved, are defined both in the ordinary budgets of the individual entities involved in the different projects, and by submitting projects to apply for European funds (especially within the framework of LIFE+ programmes and the RDP funds for rural development) as well as through private project financing.

17.5. CONCLUSIONS

IN YOUR OPINION, WHAT WILL ENSURE THAT BOTH THE FUNCTIONING OF THE BIOSPHERE RESERVE AND THE STRUCTURES IN PLACE WILL BE SATISFACTORY? EXPLAIN WHY AND HOW, ESPECIALLY REGARDING THE FULFILLMENT OF THE THREE FUNCTIONS OF BIOSPHERE RESERVES (CONSERVATION, DEVELOPMENT, LOGISTIC) AND THE PARTICIPATION OF LOCAL COMMUNITIES.

The Governance structure tested since the achievement of the designation until today has proved overall effective. However, given the large scope of the proposed extension, some changes are considered appropriate, which could also be functional to strengthening some weaknesses that had emerged.

While the Tuscan-Emilian Apennine National Park remains the coordinator of the Biosphere Reserve and the Reserve reference point as far as the MaB National Committee and UNESCO are concerned, the whole coordination will be entrusted to a Control Room within which the Apennine National Park will be supported by the Emilia Romagna and Tuscany Regions which, in this way, will put their own decision-making, legislative and operational powers as well as their respective authority at the disposal of the Biosphere Reserve.

The Tuscan-Emilian Apennine Biosphere Reserve is a collaboration agreement between multiple public bodies and private entities pivoting around a coordinating center and several connected and aligned bodies. With this respect, the experience of the Permanent Consultative Assembly is considered to be positive. The Assembly is regularly convened and held on February 19 of each year and, even despite being quite tiring, it also proves essential and therefore irreplaceable.

The Management Committee has worked well and it has defined the Action Plan and the branding strategy. However, it also showed some limits in expressing the different complex territorial articulations of the Reserve, which are not only "administrative elements", but also and above all testimonies of specific cultural, historical and environmental identities that greatly differ from each other. These limits would then be further accentuated as a result of the extension process that expands the Biosphere Reserve not only in terms of surface, but also, of identity values.

Therefore, it is proposed that the current Management Committee be subdivided into "5 territorial committees for the management of the Biosphere Reserve" based on the participation and involvement of local players from Lunigiana, Garfagnana, the Reggio Apennines, the Parma Apennines, and the Modena Apennines.

18. SPECIAL DESIGNATIONS

Name: Appennino Tosco Emiliano Biosphere Reserve (MaB UNESCO)

( ) UNESCO World Heritage Site

( ) RAMSAR Wetland Convention Site

(X) Other international/regional conservation conventions/directives (specify)

- Appennino Tosco Emiliano Biosphere Reserve (MaB UNESCO)
- Appennino Tosco Emiliano National Park
- Management Authority of Central Emilia Parks and Biodiversity – Parks of Central Emilia: Parco Regionale del Frignano (former Parco Regionale dell'Alto Appennino Modenese), Parco Regionale dei Sassi di Roccamalatina, Paesaggio Naturale e Seminaturale Protetto Collina Reggiana – Terre di Matilde, Riserva Naturale Regionale orientata della Rupe di Campotrera, Riserva Naturale orientata di Sassoguidano
- Management Authority of Western Emilia Parks and Biodiversity (Parchi del Ducato-Dukedom Parks): Parco Regionale Fluviale del Taro, Parco Regionale dei Boschi di Carrega, Parco Regionale dei Cento Laghi (ex Parco Regionale Valli del Cedra e del Parma), Parco Provinciale di Monte Fuso, Riserva Naturale Regionale orientata di Monte Prinzera
- State Natural Reserve of Orecchiella
- State Natural Reserve of Guadine Pradaccio
- State Natural Reserve of Lamarossa
- State Natural Reserve of Pania di Corfino
- Sites belonging to the "Natura 2000" network included within the Appennino Tosco Emiliano MaB Reserve:
  - Boschi di Carrega ZSC - IT4020001
  - Monte Prinzera ZSC - IT4020006
  - Groppo di Gorro ZSC - IT4020011
  - Belforte, Corchia, Alta Val Manubiola ZSC - IT4020013
  - Monte Capuccio, Monte Sant'Antonio ZSC – IT4020014
  - Crinale dell'Appennino parmense ZSC-ZPS - IT4020020
  - Medio Taro ZSC-ZPS – IT4020021
  - Barboj di Rivalta ZSC – IT4020023
  - Monte Acuto, Alpe di Succiso ZSC-ZPS - IT4030001
  - Monte Ventasso ZSC-ZPS - IT4030002
  - Monte La Nuda, Cima Belfiore, Passo del Cerreto ZSC-ZPS - IT4030003
  - Val d'Ozola, Monte Cusna ZSC-ZPS - IT4030004
  - Abetina Reale, Alta Val Dolo ZSC-ZPS - IT4030005
  - Monte Prado ZSC-ZPS - IT4030006
  - Pietra di Bismantova ZSC - IT4030008
  - Gessi Triassici ZSC - IT4030009
  - Monte Duro ZSC - IT4030010
  - Fiume Enza da La Mora a Compiano ZSC - IT4030013
  - Rupe di Campotrera, Rossena ZSC - IT4030014
  - Ca' del Vento, Ca' del Lupo, Gessi di Borzano ZSC - IT4030017
  - Media Val Tresinaro, Val Dorgola ZSC - IT4030018
  - Rio Rodano, Fontanili di Fogliano e Ariolo e Oasi di Marmirolo ZSC – IT4030021
  - Rio Tassaro ZSC - IT4030022Colli di Quattro Castella ZSC – IT4030024

- Monte Cimone, Libro Aperto, Lago di Patrignano ZSC-ZPS - IT4040001
- Monte Rondinaio, Monte Giovo ZSC-ZPS - IT4040002
- Sassi di Roccamalatina e di Sant'Andrea ZSC-ZPS - IT4040003
- Sassoguidano, Gaiato ZSC-ZPS - IT4040004
- Alpesigola, Sasso Tignoso e Monte Cantiere ZSC-ZPS - IT4040005
- Poggio Bianco, Dragone ZSC-ZPS - IT4040006
- Valle del Torrente Gordana ZSC - IT5110001
- Monte Orsaro ZSC (ex-SIC) - IT5110002
- Monte Matto - Monte Malpasso ZSC (ex-SIC) - IT5110003
- Monte Acuto - Groppi di Camporaghena ZSC (ex-SIC) - IT5110004
- Monte La Nuda - Monte Tondo ZSC (ex-SIC) - IT5110005
- Monte Sillano - Passo Romecchio ZSC - IT5120001
- Monte Castellino - Le Forbici ZSC - IT5120002
- Parco dell'Orecchiella - Pania di Corfino - Lamarossa ZSC - IT5120003
- Pania di Corfino ZPS - IT5120004
- San Valentino, Rio della Rocca ZSC - IT4030016
- Monte Romecchio – Monte Rondinaio – Poggione ZSC – IT5120005

◆ Sites of Regional Interest (SIR) of Tuscany Region:

- Lago Verde di Passo del Brattello SIR – IT5110101
- Rupi basaltiche di Piazza al Serchio e Poggio SIR – IT5120103

◆ Protected Natural Areas of Local Interest (ANPIL):

- ANPIL Fiume Magra in Lunigiana
- ANPIL Fiume Magra 2

( ) Long term monitoring site (specify)

( ) Long Term Ecological Research (LTER site)

( ) Other (specify)

19. SUPPORTING DOCUMENTS

19.1. LOCATION AND ZONATION MAP WITH COORDINATES

Within the annexed "Cartographic Atlas" are present:

- the general map of the Reserve referred to the standard geographic coordinates (WGS 84).
- the topographic map with the boundaries of the three Zones of the Reserve

In addition, Shapefiles (WGS 84) used for the production of cartography are provided.

Copies of these maps are available on the website www.dolomitiproject.it/mab/pnate

19.2. LAND COVER MAP

The "Land Cover Map" of the Reserve is in the annexed "Cartographic Atlas".

19.3. LIST OF LEGAL DOCUMENTS

The Decree of the President of the Appennino Tosco Emiliano National Park and the Municipal Councils resolutions of the 38 Municipalities participating in the MAB Reserve are annexed. The decree and the resolutions approve:

- · the contents of this candidature dossier in its entirety
- · The adhesion of part of its territory to the MaB Reserve, in accordance with the detailed perimeter (detailed subdivision into Core, Buffer and Transition Areas) found in the "Cartographic Atlas" annexed.
- · A commitment to ensure support for the conservation, management and development of the MAB Reserve.

They also give the mandate to the Chairman/Mayor or their delegate to undersign this dossier in Chapter 5..

19.4. LIST OF LAND USE AND MANAGEMENT/COOPERATION PLANS

Due to the large size of these Plans (and their attachments) we opted for reporting websites where they can be downloaded in the most up-to-date versions rather than attaching them to this dossier:

- Plan of the National Park (http://www.parcoappennino.it/pagina.php?id=5)
- Provincial Coordination Territorial Plan (PTCP - Piano Territoriale di Coordinamento Provinciale) of the Province of Parma (http://ptcp.provincia.parma.it/page.asp?IdCategoria=1770&IDSezione=&IDOggetto=&Tipo=GENERICO)
- Provincial Coordination Territorial Plan (PTCP - Piano Territoriale di Coordinamento Provinciale) of the Province of Reggio Emilia (http://www.provincia.re.it/page.asp?IDCategoria=701&IDSezione=20680)
- Provincial Coordination Territorial Plan (PTCP - Piano Territoriale di Coordinamento Provinciale) of the Province of Modena http://www.territorio.provincia.modena.it/page.asp?IDCategoria=121&IDSezione=3920)
- Provincial Coordination Territorial Plan (PTCP - Piano Territoriale di Coordinamento Provinciale) of the Province of Lucca (http://www.provincia.lucca.it/pianificazione/index.php?id=31)
- Provincial Coordination Territorial Plan (PTCP - Piano Territoriale di Coordinamento Provinciale) of the Province of Massa Carrara (http://portale.provincia.ms.it/page.asp?IDCategoria=2102&IDSezione=9988)
- Provincial Coordination Territorial Plan (PTCP - Piano Territoriale di Coordinamento Provinciale) of the Province of La Spezia (https://www.provincia.sp.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/103)
- Regional Landscape Territorial Plan (PTPR - Piano Territoriale Paesaggistico Regionale) of Emilia-Romagna Region (https://territorio.regione.emilia-romagna.it/paesaggio/PTPR)
- Landscape Coordination Territorial Plan (PTCP - Piano Territoriale di Coordinamento Paesistico) of Liguria Region (https://www.regione.liguria.it/homepage/territorio/piani-territoriali/piano-territoriale-di-coordinamento-paesistico.html)

19.5. SPECIES LIST

The "Species List" is annexed with information on the status of priority, the entity and the trend of the population, the state of knowledge and state of conservation, threats, conservation measures and an evaluation of proposals management measures.

19.6. LIST OF MAIN BIBLIOGRAPHIC REFERENCES

Attached

19.7. ORIGINAL ENDORSEMENT LETTERS ACCORDING TO PARAGRAPH 5

In addition to the Appennino Tosco Emiliano National Park and the Municipalities belonging to the Reserve of which the Council resolutions in support of the candidacy as Appennino Tosco Emiliano MaB Reserve the following endorsement letters have been received at the moment of the first candidature and were included in the nomination form:

- Chamber of Commerce Industry, Craft, and Agriculture of Parma
- Chamber of Commerce Industry, Craft, and Agriculture of Reggio Emilia
- Consortium of Reggio Emilia Apennines chestnut growers
- Reggio Children Foundation
- State High School "Cattaneo Dall'Aglio" of Castelnovo ne' Monti
- Italian Alpine Club of Parma
- State Technical High School of Castelnovo ne' Monti
- Local Action Group (GAL) "Garfagnana Ambiente e Sviluppo"
- Management Authority for Western Emilia Parks and Biodiversity
- Tuscany Region – Directorate-General for Environmental Policy, Energy and Climate Change
- Local Action Group GAL "Consorzio Sviluppo Lunigiana Leader"
- "Bank" of Identity and the Memory of the Garfagnana
- Italian Alpine Club
- Local Action Group (GAL) "Antico Frignano Appennino Reggiano"

19.8. FURTHER SUPPORTING DOCUMENTS.

You can also find enclosed:

- within the "Cartographic Atlas", besides those already mentioned, there are the following maps:
  - 167 topographic maps
  - 14 detailed maps, one for each Core area
- A detailed description of the Reserve habitats

- List of scientific studies carried out on the territory
- Municipal resolutions in support of the candidature process of the MAB Reserve (electronic format only).

20. ADDRESSES

20.1. CONTACT ADDRESS OF THE PROPOSED BIOSPHERE RESERVE:

Name: Parco Nazionale dell'Appennino Tosco-Emiliano

Street or P.O. Box: Via Nazionale 23

City with postal code: 54010 Sassalbo di Fivizzano (MS)

Country: Italy

Telephone: 0039 0585-947200

E-mail: info@parcoappennino.it

Web site: www.parcoappennino.it

20.2. ADMINISTERING ENTITY OF THE CORE AREA(S):

Name:Parco Nazionale dell'Appennino Tosco-Emiliano

20.3. ADMINISTERING ENTITY OF THE BUFFER ZONE(S):

Name: Parco Nazionale dell'Appennino Tosco-Emiliano

Street or P.O. Box: Via Nazionale 23

City with postal code: 54010 Sassalbo di Fivizzano (MS)

Country: Italy

Telephone: 0039 0585-947200

E-mail: info@parcoappennino.it

Web site: www.parcoappennino.it

20.4. ADMINISTERING ENTITY OF THE TRANSITION AREA(S):

Name: Parco Nazionale dell'Appennino Tosco-Emiliano

Street or P.O. Box: Via Nazionale 23

City with postal code: 54010 Sassalbo di Fivizzano (MS)

Country: Italy

Telephone: 0039 0585-947200

E-mail: info@parcoappennino.it

Web site: www.parcoappennino.it

COLOPHON

SOURCES OF DATABASES USED

Emilia-Romagna Region

Tuscany Region

Liguria Region

National Cartographic Portal (NCP)

National Institute of Statistics (ISTAT)

Higher Institute for Environmental Protection and Research (ISPRA)

Statistical Office of the European Union (EUROSTAT)

Copernicus Land Monitoring Service

CARTOGRAPHIC PROJECTION AND MEASUREMENT SYSTEMS

Unless otherwise indicated, each distance or area measure is calculated on ellipsoid projection WGS84, Time Zone 32 North (EPSG:32632) and rounded to the nearest integer.

WORK GROUP

Temporary Association of Companies between Curotti Alessandra, Dolomiti Project Srl (Furin Stefano, Oddone Emiliano, Trentini Tommaso) and Punto3 Srl (Lenzerini Filippo, Mascanzoni Mattia, Stemberger Sara);

Staff of the Appennino Tosco-Emiliano National Park;

Staff of the Management Authority for Central Emilia Parks and Biodiversity;

Staff of the Management Authority for Western Emilia Parks and Biodiversity;

We also thank Caponi Pierangelo, Fiorini Sergio and Manfredi Lorenza.

TRANSLATIONS

Dragomanno S.r.l.

CARTOGRAPHY

Dolomiti Project Srl (Furin Stefano, Trentini Tommaso)

EDITING

Dolomiti Project Srl (Furin Stefano, Oddone Emiliano)

United Nations
Educational, Scientific and
Cultural Organization

Man and
the Biosphere
Programme

EXTENSION DOSSIER

APPENNINO TOSCO EMILIANO

A MOSAIC OF DIVERSITY ACROSS THE APENNINIC CREST, A BORDER BETWEEN EUROPEAN AND MEDITERRANEAN CLIMATE

PART 2