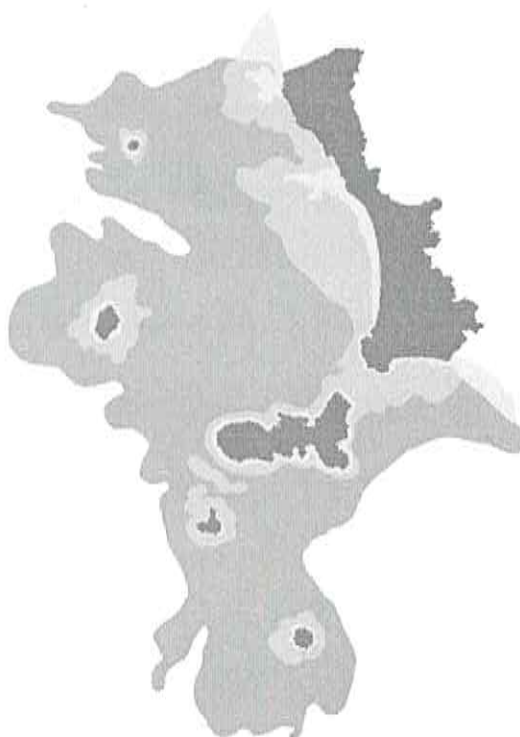




# **NATIONAL PARK OF THE TUSCAN ARCHIPELAGO**

**Nomination to the network "Biosphere Reserve" MAB- UNESCO Programme**

## **Tuscan Islands Biosphere Reserve (TIBR)**



**Coordinator**

Ruggero Barbetti

**Edited by**

Francesco Primo Vaccari and Franco Miglietta  
IBIMET-CNR (Firenze)

**Technical support**

Francesca Giannini

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## **PART I : SUMMARY**

### **1. PROPOSED NAME OF THE BIOSPHERE RESERVE:**

[It is advisable to use a locally accepted geographic, descriptive or symbolic name which allows people to identify themselves with the site concerned (e.g. Rio Platano Biosphere Reserve, Bookmark Biosphere Reserve). Except in unusual circumstances, Biosphere Reserves should not be named after existing national parks or similar administrative areas]

Tuscan Islands Biosphere Reserve (TIBR)

### **2. COUNTRY:**

Italy

### **3. FULFILLMENT OF THE THREE FUNCTIONS OF BIOSPHERE RESERVES**

(Article 3 of the Statutory Framework presents the three functions of conservation, development and logistic support. Explain in general terms how the area fulfills these functions.)

The Tuscan Archipelago represents an interesting and unique system in the Mediterranean Region encompassing an extraordinary range of geological, geomorphological and biological diversity that has almost no similarities in the Mediterranean. Seven main islands as well as a few sparse islets are distributed in a latitudinal range comprised between 42° 13' and 43° 26' North. The Islands of the Archipelago are very different from each other in terms of geological substrates, soils, vegetation, natural and human history and development. All those differences are very striking and unique. Complexity, besides diversity, is another keyword to define the Archipelago. The two largest Islands (Elba and Giglio) are diverse and complex due both to past historical events and to their geomorphology. The recent development of tourism has added more complexity by creating an enormous pressure on the natural environment, both terrestrial and marine. History has modeled the landscape which is now the result of a complex social development and a complex land use. The Islands of Capraia, Gorgona and Pianosa have hosted, over the last century three important national prisons. This has prevented excessive anthropization of environment but not some serious environmental degradation. Natural biodiversity has been preserved, to some extent on in these islands, but further conservation still requires some continued effort. At the same time, new and innovative development strategies must be introduced on those islands to create synergies and opportunities to combine environmental protection and social/rural development. The Island of Montecristo is now a protected area with extremely limited access for a restricted number of visitors. It is one of the very few examples of an island being an "Integral Environmental Reserve" in the Mediterranean Region. The islets of Formiche di Grosseto and Scoglio Africa are just uninhabited rocks emerging from the sea for a few meters, but despite their very limited size, those islets are the basis for a number of ecological processes that have a great importance for both the terrestrial and marine biosphere. The Tuscan Islands Biosphere Reserve (TIBR) will be all this diversity and complexity, while established over an area

that is at the interface between Nature and Man and extends well beyond the boundaries of a National Park, as prescribed by the MAB Biosphere Reserve Network.

3.1 "Conservation contribute to the conservation of landscapes, ecosystems, species and genetic variation" (Stress the importance of the site for conservation at the regional or global scales)

The Tuscan Islands Biosphere Reserve (TIBR) will create unprecedented opportunities to link and coordinate the activities of three main actors: the National Park of the Tuscan Archipelago that extends over a significant portion of the territory, the National and the Local Authorities in charge of nature conservation and protection and sustainable development and a number of Scientific Laboratories and Research Projects that already exist in the area. All this will also be designed and implemented to enhance and improve current efforts to conserve landscapes, ecosystems, species and genetic variation over the area. Nature and habitat conservation in the Tuscan Archipelago is important for the entire Mediterranean Region. This document will highlight, in the following Chapter 12, the most important aspects of species and habitat conservation in the Archipelago emphasizing aspects dealing with the presence of rare and endemic species whose protection is a priority. Due to their geographical and phytoclimatic position, the islands are occupied by schlerophyllous evergreen vegetation with the only exception being of Mount Capanne, at higher altitude. But at least 20 different terrestrial habitats have been identified, hosting 43 endemic and 42 protected plant species. At least 20 different protected and rare species of reptiles thrive in the different islands together with 8 species of protected and rare birds, 7 species of protected mammals and 18 protected marine species. Altogether, the seven islands of the Archipelago can be seen as a large reserve where a significant part of Mediterranean biodiversity should be conserved and protected. All the Tuscan Archipelago is part of the Sanctuary of the Cetacean (Legge n°391/2001)

3.2 "Development foster economic and human development which is socio culturally and ecologically sustainable". (Indicate the potential of the proposed biosphere reserve in fulfilling this objective).

At present, more than 30,000 people live in the seven islands of the Archipelago. Most of their activities are related to tourism and services, with very little occupation in the primary and secondary sector. The interface between man and his activities and the biosphere is a critical issue in the area and is at the base of the creation of the National Park. Current recommendations to promote ecologically sustainable development in the area include the promotion of production diversification and the enhancement of economic competitiveness by means of an increased quality of the products. But very little has been done, so far, to develop a consistent model where nature and habitat conservation are combined with sustainable economic development. The TIBR intends to contribute to the identification of such a model by bringing together and coordinating the efforts of the national and local administration, the park's authorities and a number of scientific laboratories and universities. Experimental activities are planned to introduce renewable energy resources, to bring innovations to the agricultural sector and to enhance the availability of water by means of sustainable technologies. The



participation of the TIBR in the global MAB Network will enhance the opportunities to exchange of information with other Biosphere Reserves, thus providing the possibility to enhance and improve the model that is currently adopted.

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". (Indicate current or planned facilities).

The National Park of the Tuscan Archipelago is already involved in a number of collaborations with Research Institutions in the country. Research activities are on-going for the protection of the social and cultural environment and for nature protection. Logistic support is provided to the scientists and ad-hoc personnel is available to support those activities. In the following table, a list of the deliberations of the National Park Council dealing with education, research and development is given:

98-006	Progetto Formazione (Parco Progetti Obiettivo 3 - Unione Europea)
98-010	Studio e progetto per la fruizione e la salvaguardia delle aree marine e terrestri dell'Isola di Capraia
98-011	Studio e progetto per la fruizione e la salvaguardia delle aree marine e terrestri dell'Isola di Giannutri
98-013	Progetto "Puliamo il Parco": informativa e determinazioni
98-023	Delibera C.I.P.E. 18 dicembre 1996: Laboratorio didattico all'Enfola: determinazioni
98-027	Iniziative di educazione ambientale della Scuola Media "Micali" di Capraia
98-039	Programma Triennale Tutela Ambientale - Programma Triennale Aree Protette (1989 - 96) – Capraia
98-040	Programma Triennale Tutela Ambientale - Programma Triennale Aree Protette (1989 - 96) – Giannutri
98-041	Adezione alla manifestazione "Per il futuro, Ambiente, Lavoro, Solidarietà"
98-043	Indagine per ipotesi di riqualificazione ambientale dell'isola di Pianosa
98-053	Progetto sentieri Elba: grande traversata Elbana-approvazione progetto esecutivo
98-057	Proposta di contributo Punto Parco al Centro Giovani di Rio Marina
98-061	Integrazione alla delibera n.14/98 per patrocini ad attività culturali e scientifiche
98-062	Puliamo il Parco '98 -relazione; II fase -proposta di interventi e convegno
98-063	Proposta di adesione all'iniziativa "A cavallo nei parchi"
98-095	Convegno Italia nostra su "Politica del Mare"
98-099	Puliamo il Parco 1998 -II fase
98-106	Finanziamento per completamento ricerche marine all'Isola di Giannutri
98-109	Studio per la fruizione e la salvaguardia dell'Isola di Pianosa
98-112	Assegnazione premi di laurea tesi realizzate dall'A.A. 1989-1990 all'annualità 1994-95
99-044	Progetto Isola di Giannutri - recupero, risanamento e riqualificazione
99-047	Educazione ambientale
99-049	Partecipazione alla manifestazione "Festambiente 1999"
99-054	Adesione al progetto con fondi dell'Unione Europea "Marine Coastal environment relationship multidisciplinary analysis for innovative decision-making support"
99-064	Schema del documento programmatico tra l'Amministrazione Comunale di Livorno ed il Ministero di Grazia e Giustizia - Dipartimento Amministrazione Penitenziaria - Istituto di Pena dell'Isola di Gorgona, il Consorzio per il Centro Interuniversitario di Biologia
99-068	Ratifica PUP n. 4 del 30.06.1999 "Contributo relativo alla realizzazione di campi di volontariato di Legambiente per l'estate 1999 nella Località di Pomonte nel Comune di Marciana all'Isola d'Elba e all'Isola di Pianosa"
99-074	Isola di Pianosa: studio di prefattibilità - Insula UNESCO
99-079	Isola di Pianosa - Attività sperimentale di fruizione



99-097	Progetto per la valutazione delle risorse marine dell'Arcipelago Toscano - Partner: National Geographic Society, Stanford University, North Carolina University, Università degli Studi di Pisa, Università degli Studi di Firenze,
00-010	Educazione Ambientale: Progetto "Conoscere Pianosa

As far as studies and project, the Park authorities have provided substantial support to the following initiatives:

Museo Zoologico La Specola dell'Università di Firenze	Ricognizione sulle emergenze naturalistiche e culturali di Pianosa.
Università di Pisa Dip. Etologia, Ecol. ed Evoluzione	Studio tecnico-scientifico sulla popolazione dei cinghiali nel territorio del Parco all'Isola d'Elba e sui mulloni all'Isola d'Elba e Capraia
Insula – Unesco Arch. Schivo	Isola di Pianosa: progetto per un'ecoisola modello: osservatorio e laboratorio internazionale per le problematiche dell'habitat insulare
Università di Firenze Dip. Urbanistica Prof. Guido Ferrara e Dr.ssa Giuliana Campioni.	Studio sulle aree minerarie del versante orientale dell'Isola d'Elba inserite nel perimetro del Parco.
CNR-IBIMET Dr. Francesco Primo Vaccari	Pianosa Lab: Proposta per un progetto di ricerca e monitoraggio degli ecosistemi terrestri dell'area Mediterranea
Università di Camerino Dip. Biologia Molecolare, Cellulare ed Animale	Ricerca di marcatori molecolari per l'identificazione di eucarioti unicellulari marini (protozoi ed alghe) potenzialmente dannosi, da utilizzare per il monitoraggio degli ecosistemi marini costieri nell'Arcipelago Toscano.
Museo Zoologico "La Specola" Univ. Firenze e National Geographic	Proposta per un programma scientifico per la valutazione delle risorse marine costiere dell'Arcipelago Toscano
Accademia dei Georgofili Firenze	MARMAID "Marine coastal environment relationships multi-disciplinary analysis for innovative decision-making support".
Università di Pisa Dip. Scienze dell'Uomo e dell'Ambiente	Studio della diversità, distribuzione spaziale e fluttuazioni temporali dei popolamenti ad alghe ed invertebrati che occupano la fascia infralitorale superficiale e mesolitorale delle coste rocciose dell'Isola di Giannutri.
NEMO Sas	Progetto Life-Natura Capraia e le isole minori della Toscana: tutela della biodiversità
Museo di Storia Naturale del Mediterraneo Livorno	Progetto Piccole Isole 2000: campagna di inanellamento degli uccelli per lo studio della migrazione primaverile presso la stazione di Capraia Isola
Museo di Storia Naturale di Calci	Biodiversità: compilazione delle specie dell'entomofauna e dei piccoli vertebrati della Corsica e della Toscana Marittima
Museo di Storia Naturale di Calci	Studi sulla Vipera aspis di Montecristo
Istituto Nazionale Analisi e Protezione Agroecosistemi Firenze	Progetto Europeo di Ricerca (MEDEFU), finalizzato allo studio ed all'analisi degli scambi tra vegetazione mediterranea ed atmosfera. Obiettivo: calcolare il bilancio totale di carbonio dell'ecosistema mediterraneo. Interesse per l'isola di Pianosa poiché poco antropizzata.
Università di Pisa Dip. Scienze dell'Uomo e dell'Ambiente	Attività di ricerca presso l'isola di Capraia, relativa alla comparazione della struttura e della biodiversità dei popolamenti benthici (alghe ed invertebrati) di costa rocciosa tra 0 e 10 metri di profondità in aree protette ed in aree esposte a pressione antropica
Università di Pisa Dipartimento di Etologia, Ecologia, Evoluzione	Caratterizzazione delle biocenosi benthiche dell'Isola di Capraia e valorizzazione dell'isola a fini didattici e naturalistici. Censimento dell'ittiofauna con stesura di carta bionomica; promozione di attività didattiche e divulgative naturalistiche, creazione di strutture espositive e didattiche permanenti.
Gruppo Foca Monaca Italia - Luigi Guarrera WWF	Survey effettuato tra il 13 ed il 25 luglio '98 nelle isole di Montecristo, Pianosa e Gorgona (PNAT) per una prima verifica dei siti storici della foca monaca. Dicembre '98
Università di Milano	Studio dell'organizzazione sociale dell'ape Andrena agillissima, presso il sito di nidificazione a Colle Palombaia all'Isola d'Elba
Associazione A.S. Martorella	Manifestazione ciclistica
Associazione Sottocosta	Manifestazione Elba Maremarathon
Comune di Marciana	Festa tradizionale "Palio sant'Agabito"
Associazione A.B.A.E	Strade del Biologico
Consorzio Capo Sant'Andrea	Compilazione guida "A spasso nel Parco"
Pro Loco Isola del Giglio	Campagna di sensibilizzazione ambientale

Associazione "Blu Meetings"	Organizzazione convegno "Sesta giornata pediatrica all'Isola dell'Elba"
Associazione GIROS	Censimento delle orchidee all'Isola d'Elba
Comitato Promotore del Premio letterario "Raffaello Brignetti"	Pubblicazione opuscolo esplicativo
Associazione Isola dei Gatti	Censimento colonie feline all'Isola d'Elba
Associazione Nautica da Diporto	Servizio di vigilanza volontaria
Società ciclistica Elba Ovest	Organizzazione della manifestazione Gran Fondo Elba Ovest
Comune Isola del Giglio	I giro podistico dell'Isola del Giglio

Moreover the National Park has funded the following research projects:

- Monitoring campaigns of the wild birds on Pianosa island (2001, 2002 and 2003)
- University of Turin: "Monitoring study of the demographic and health status of the moufflon"
- University of Florence: "Botanic studies on the sandy dune of the Lacona bay"
- University of Pisa: "Studies on the genetic population of the boar of the Elba island"
- Unesco: "International Campus on historical emergencies of the Capanne Mount in the Elba island"
- Tuscan Ornithological Centre: "Monitoring project of the marine avifauna in the Tuscan Archipelago"

Major investments have also been made in the area of the TIBR to create the following infrastructure (the numbers in parenthesis indicate the fraction of the total expenditure allocated to any specific action):

- Trails (29%);
- Lodging and administrative facilities (25%);
- Environmental education and awareness and promotion (11%);
- Land management and hydrology (10%);
- Waste management (9%);
- Protection of Fauna and Flora (5%);
- Forest fire prevention (4%);
- Historical, architectural and archaeological heritage (3%);
- Biodiversity and habitat protection (2%);
- Water resources (2%)

#### 4. CRITERIA FOR DESIGNATION AS A BIOSPHERE RESERVE

[Article 4 of the Statutory Framework presents 7 general criteria for an area to be qualified for designation as a biosphere reserve which are given in order below.]

##### 4.1. "Encompass a mosaic of ecological systems representative of major biogeographic regions, including a gradation of human intervention"

(The term "mosaic" refers to a diversity of natural habitats and land cover types derived from human uses such as fields, managed forests, etc. The term "major biogeographic region" is not strictly defined but it would be useful to refer to the map of the "World Network of Biosphere Reserves" which presents 12 major ecosystem types at a global scale).

The seven islands of the Archipelago show considerable morphological diversity. Elba is characterized by mountainous territory of various altitudes alternating with valleys and small coastal plains. The minor islands present a variety of forms, ranging from the rugged and steep morphology of Montecristo to the highly particular shape of Pianosa, which is almost completely flat. The entire archipelago is distinguished by the diversity and scenic beauty of its landscapes, its coasts and the sea, which turn some of the islands into important tourism destinations during the summer. The Archipelago is characterized by an exceptional geodiversity, unique in the Mediterranean, which in a relatively small area displays an extremely wide variety of sedimentary, metamorphic and igneous rock. It can be considered a key area for the reconstruction of the geological evolution of the Alpine and Northern Apennine orogenic systems since it encompasses tectonic elements of the Apennine (Ligurian and Tuscan parts) as well as metamorphic sequences that can be correlated to those of the mountainous part of Corsica (Schistes Lustrés). Moreover, the Archipelago's islands present ample evidence of the magmatic events of the Myocene, both in the form of pluton dike granitic (Mount Capanne, Giglio, Montecristo) and as volcanic complexes (Capraia). The mineral deposits of Elba are unique for their great scientific, historical and – particularly in the past – economic interests. The inclusion of Elba in the "*World Heritage List of Geological Sites*" of the UNESCO was proposed in 1990 mostly on the basis of aspects connected to the island's mineral wealth. Despite the fact that it has already undergone intense changes caused by humans (from fires to the introduction of exotic species, from reforestation to agriculture) – which in particular have seen the introduction of heliophile, low bush, fruticous and suffruticous flora in place of nemoral, mesophile and skiophilous elements – the Tuscan Archipelago represents a flower and vegetation bridge and filter between the Sardinian-Corsican environment and the Italian peninsula. The presence of rare endemic species and of some species protected by the Habitat Directive confirm a diversity of flowers and vegetation in need of conservation and protection, with particular attention paid to the psammophilous species of the sandy shores of Elba and Giglio, which have been degraded by the presence of tourism, and to the hygrophile species of the limited humid environments. The marine environment is made particularly rich and ecologically significant by the integrity of the sea beds around Gorgona, Pianosa, Montecristo and Giannutri whose biocenoses have maintained intact the characteristics typical for the north-western area of the Mediterranean, by the presence of a rich and diversified benthic and fish population, by the presence of numerous endangered or protected species that are included in Appendix III of the Bern Convention and that have already disappeared in many parts of the Mediterranean



(such as red and black coral, sea urchins, various crustaceans and molluscs), by the survival of very rare species such as the mollusk *Jujubinus baudoni*, and by the beds of *Poseidonia oceanica* (marine habitat listed in Appendix I of EEC Directive 92/43), which are particularly large around Pianosa and Formiche di Montecristo but are also found all over the Archipelago, evidence of the good state of the marine environment.

#### 4.2 "Be of significance for biological diversity conservation"

(This should refer not only to the numbers of endemic species, or rare and endangered species at the local, regional or global levels, but also to species of globally economic importance, rare habitat types or unique land use practices (for example traditional grazing or artisanal fishing) favouring the conservation of biological diversity. Give only a general indication here.)

The Mediterranean Basin is of importance in the context of the conservation of global biological diversity. The Mediterranean is one of 25 biodiversity hotspots of the Earth with exceptional concentrations of endemic species, where large spatial and temporal variability and interdependence exists whose sustainable management requires large-scale and long-term planning. The Tuscan Archipelago is a hot spot within the Mediterranean Region as it contains a large number of different habitats and a large number of endangered and rare species of plants and animals (see Chapter 12). Thousands of years of human colonization have also created diversity in the cultivated species, which also require the development of conservation measures. But at present, the ecosystems that support all this diversity are particularly sensitive to pressure from anthropogenic sources, for example through tourism, urbanisation, fire, pollution, habitat loss or fragmentation and the introduction and spread of non-indigenous species. Hence, to prevent major diversity losses, guidelines and methods to optimize the design of networks of nature reserves, to manage conflicts over land and water use, and to preserve species, ecosystems and landscapes are urgently needed. Initiatives that will be considered and supported to protect biodiversity in the islands of the Tuscan Archipelago will be of significance for the entire Mediterranean Region. We expect, in fact, that the creation of the MAB Biosphere Reserve in this zone will create the premises for a better understanding of the processes of biodiversity change and their effects on marine and terrestrial ecosystem function and of the large-scale and long-term dynamics of biodiversity, including its relation to the functioning of ecosystems across succession stages. Further knowledge will be gathered about the effects of the connectedness, ecological context and critical size of habitat fragments and the process and history of fragmentation on the ecological quality of fragmented landscapes in view of the development and testing of scientific management and policy tools to control invasive species. Some important research initiatives that are on-going or planned in the TIBR area will develop adaptive, integrated strategies incorporating climate change and land use scenarios and socio-economic aspects for the management, restoration and conservation of terrestrial and marine ecosystems, thus strengthening and expanding taxonomic competence, particularly in relation to the conservation and use of biodiversity.

#### 4.3 "Provide an opportunity to explore and demonstrate approaches to sustainable development on a regional scale"

(Describe in general terms the potential of the area to serve as a pilot site for promoting the sustainable development of its region (or "eco region")

The recent Economic and Social Development Plan presented by the Tuscan Archipelago National Park is evidence for the possibility of the TIBR becoming a pilot site for the promotion of sustainable development in Mediterranean environments. The plan gives considerable attention to the aspects of sustainability. Indeed, sustainability constitutes an essential and amply shared characteristic of any economic development plan. Nevertheless, it is not easy to define and measure sustainability, especially – but not only – since it includes a great variety of aspects regarding the use, transformation and modification of resources, the relevance of which must, among other factors, be evaluated on the basis of the regenerative capacities of those resources. Sustainability is the outcome of a complex relationship between the pressures created by human activities and the environment's capacity to withstand those pressures. The complexity of the problem is confirmed by the lack of an agreement at the international level regarding the most suitable indicator for the measuring of sustainability. These already complicated considerations have become even more problematic due to the recent tendency to include additional factors beyond the environment when contemplating sustainability. Indeed, social sustainability is increasingly discussed as well. Reference is made in particular to aspects concerning the quality of life that affect the well-being of the population and to forms and substance of inequalities that may in various ways help to aggravate the problems of environmental sustainability.

#### 4.4 "Have an appropriate size to serve the three functions of biosphere reserves"

(This refers more particularly to (a) the surface area required to meet the long term conservation objectives of the core area(s) and the buffer zone(s) and (b) the availability of areas suitable for working with local communities in testing out and demonstrating sustainable uses of natural resources.)

The nominated Biosphere reserve (Stage 1) extends over about 2360 square kilometres of marine area and 285 square kilometres of terrestrial area. These areas are large enough to ensure the long term conservation objectives of the core and buffer areas. The large area size and population in the transition area is more than adequate for working with local communities in testing out and demonstrating sustainable uses of natural and cultural resources.

#### 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" ?  
(Describe the core area(s) briefly, indicating their legal status, their size, the main conservation objectives)

The terrestrial core zones within the proposed Biosphere Reserve comprise areas of National Park all reserved in public ownership. These areas have outstanding natural and cultural values.

"(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..."  
(Describe briefly the buffer zones(s), their legal status, their size, and the activities which are ongoing and planned there).

The buffer zones initially are partially privately owned and partially managed in public ownership.

"(c) an outer transition area where sustainable resource management practices are promoted and developed"

(The Seville Strategy gave increased emphasis to the transition area since this is the area where the key issues on environment and development of a given region are to be addressed. The transition area is by definition not delimited in space, but rather is changing in size according to the problems that arise over time. Describe briefly the transition area as envisaged at the time of nomination, the types of questions to be addressed there in the near and the longer terms. The size should be given only as an indication).

Transition areas cover a large part of the proposed Biosphere Reserve with a very substantial extent of terrestrial and marine areas. The marine areas are required to provide a full range of recreational uses, while the terrestrial areas include agricultural and urban land uses. One of the greater challenges associated with the proposed Biosphere Reserve is to achieve sustainable use of the area's natural and cultural resources while providing for the economic and social needs of the community. This will be addressed by bringing together policy makers and scientists in the context of a collaboration with the National Park of the Tuscan Archipelago.

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."

(Are such arrangements in place or foreseen)

Many of these arrangements are in place and more are foreseen. All core areas and initial buffer areas are land in public ownership managed primarily for conservation purposes. This already involves national and local government authorities. The transition area is, instead, mostly in private ownership, and the primary focus of the proposed Biosphere Reserve there will be to educate and help local communities to conserve and enhance the biological diversity of their environment. This will be achieved also by the involvement and participation of a number of scientific laboratories that will be in charge of direct experimentation as well as of programmes aimed at the enhancement of public awareness. Private companies will also be involved by providing opportunities to better market their products and offers in the context of the proposed Biosphere Reserve.

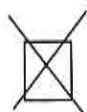


#### 4.7 Mechanisms for implementation

(This refers to the administrative mechanisms, which often are determined at the national level.)

Does the proposed biosphere reserve have :

"(a) mechanisms to manage human use and activities in the buffer zone or zones" ?



Yes

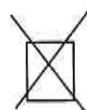


No



Planned

"(b) a management plan or policy for the area as a biosphere reserve" ?



Yes



No



Planned

"(c) a designated authority or mechanism to implement this policy or plan" ?



Yes



No



Planned

(d) programmes for research, monitoring, education and training"?

(Describe briefly research/activities monitoring (ongoing or planned) as well education and training activities)



Yes



No



Planned

- Research of flora and fauna, cataloguing and inventory of species
- Observational studies of the environment and the impact of climatic changes on the Mediterranean ecosystem (Pianosa\_LAB)
- Geological and mineralogical studies
- Monitoring of migratory fauna
- Monitoring of water resources and quality
- Environmental education in cooperation with the schools on the territory of the Tuscan Archipelago
- Maintenance of hiking trails and nature paths to ensure a correct use of the Park's resources

## 5. ENDORSEMENTS

5.1 Signed by the authority/authorities in charge of the management of the core area(s):

Full name:

Ente Parco Nazionale Arcipelago Toscano e Ministero Risorse Agricole, Alimentari e Forestali Gestione Ex ASFD Servizio V – solo per l'Isola di Montecristo

Title:

Legge 394 art. 31 "Beni di proprietà dello Stato destinati a riserva naturale"

Date:

06/12/1991

5.2 Signed by the authority/authorities in charge of the management of the buffer zone(s):

Full name:

Ente Parco Nazionale Arcipelago Toscano, WWF Italia e Associazione AMAB

Title:

Protocollo per il recupero e la tutela delle razze domestiche autoctone a rischio di estinzione e lo sviluppo dell'agricoltura biologica nelle aree protette

Date:

Delibera del Consiglio direttivo dell'Ente n. 18/2001

Full name:

Ente Parco Nazionale Arcipelago Toscano, Agenzia per il Turismo dell'Arcipelago Toscano, Comunità Montana dell'Elba e Capraia, Comuni dell'Isola d'Elba, Associazioni albergatori, Confesercenti, ConfCommercio, FAITA

Title:

Accordo per la gestione coordinata della comunicazione turistica all'Isola d'Elba

Date:

Delibera del Consiglio direttivo dell'Ente n. 12/2001

Full name:

Ente Parco Nazionale Arcipelago – Confederazioni per l'Agricoltura, Organizzazioni sindacali, Gal Arcipelago Toscano

Title:

Accordo per la valorizzazione delle colture tipiche e sviluppo occupazionale

Date:

13/05/99

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:

Full name :

Ministero dell'Ambiente – Centrali Cooperative e Confederazioni Nazionali per l'Artigianato

Title:

Protocollo d'Intesa del Ministero dell'Ambiente con le Confederazioni dell'Artigianato per lo sviluppo occupazionale e promozione di attività economiche eco-compatibili

Date:

18/06/1998

- 5.4 Signed by the authority/authorities, elected local government recognized authority or spokesperson representative of the communities located in the transition area.

Full name:

Ente Parco Nazionale Arcipelago , Ministero delle Finanze, Ministero dell'Ambiente, Regione Toscana, Provincia di Livorno, Comune di Capraia Isola

Title:

Valorizzazione dei beni demaniali dell'Ex Carcere dell'Isola di Capraia

Date:

29/03/2000

Full name:

Ente Parco Nazionale Arcipelago Comuni Elbani, Comunità Montana dell'Elba e Capraia, AMNUP, CNA, API Toscana

Title:

Accordo per la gestione dei rifiuti inerti all'Isola d'Elba

Date:

04/08/99

Full name:

Ente Parco Nazionale Arcipelago e Provincia di Livorno

Title:

Accordo per la costituzione di uno sportello unico per le attività produttiva.

Date:

Settembre 1999

- 5.5 Signed on behalf of the MAB National Committee or focal point:

Full name : \_\_\_\_\_

Title : \_\_\_\_\_

Date: \_\_\_\_\_



## PART II : DESCRIPTION

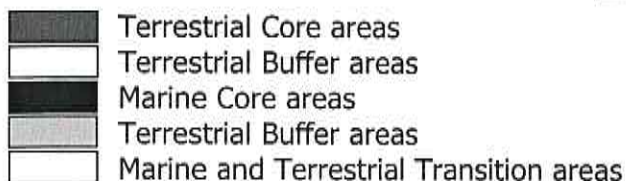
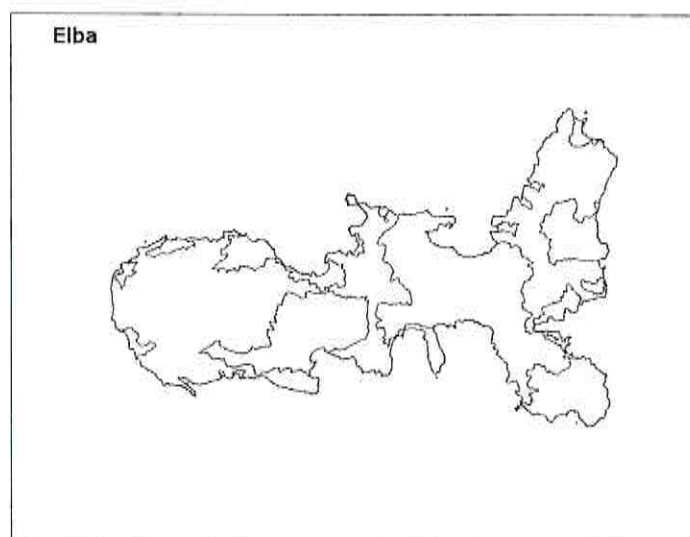
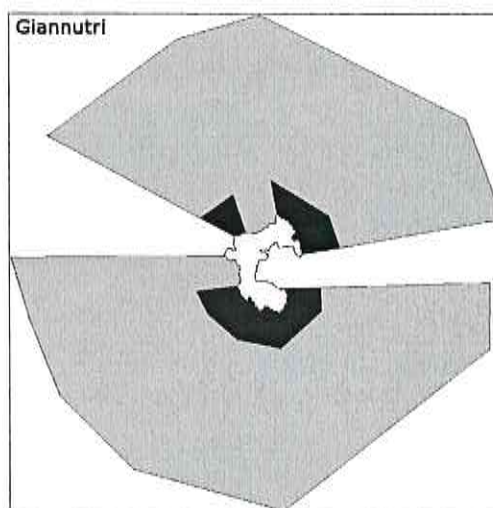
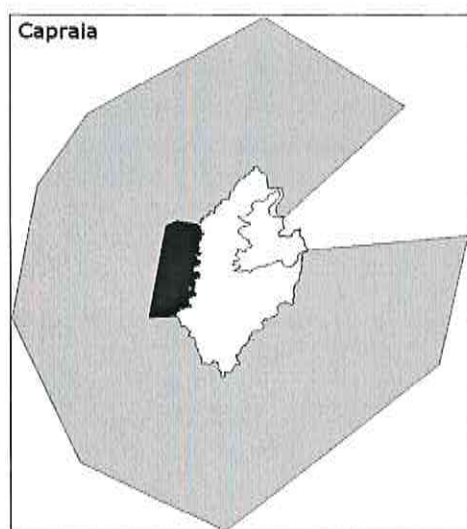
### 6. LATITUDES AND LONGITUDES OF AREA:

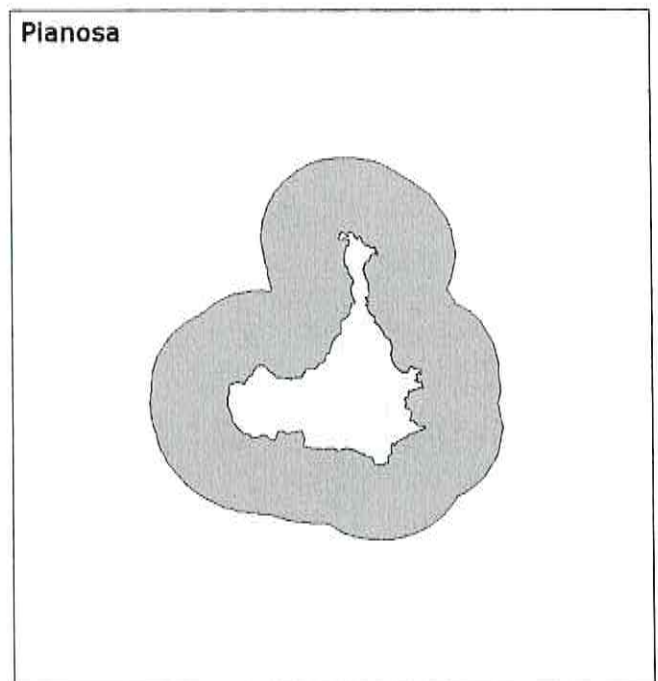
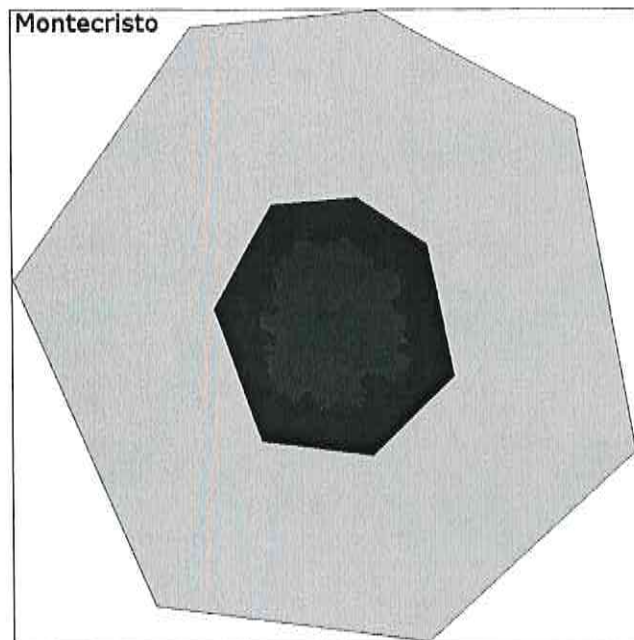
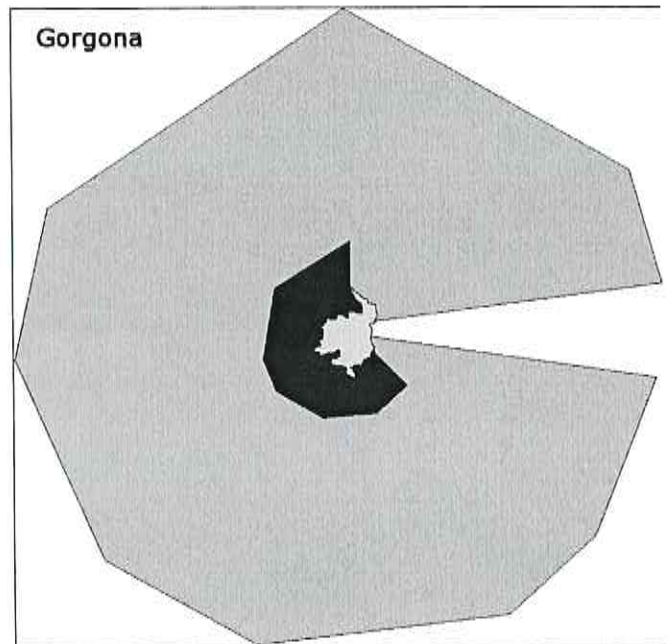
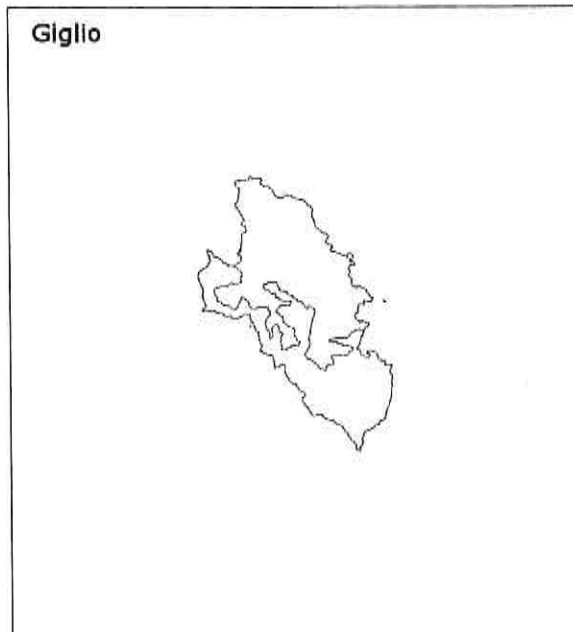
[Indicate in degrees minutes, seconds. Indicate coordinates of the central point of the proposed biosphere reserves and if possible, the outer limits of the buffer zone]






The Core, Buffer and Transition Areas that will be part of the TIBR correspond specifically to the islands of the Tuscan Archipelago and thus cannot easily be identified in a clear-cut manner with one boundary and one central point, especially because the terrestrial areas and the adjoining marine areas must be considered together.

The following map shows the overall division of the TIBR and of the various areas on the six largest islands of the Archipelago.

### TERRESTRIAL AND MARINE AREAS





- |   |   |
|---|---|
|  | Terrestrial Core areas                  |
|  | Terrestrial Buffer areas                |
|  | Marine Core areas                       |
|  | Terrestrial Buffer areas                |
|  | Marine and Terrestrial Transition areas |

## **MARINE AREAS**

The Core Areas on the preceding map are defined by polygons whose vertices are as follows:

Isola di Capraia		
Punto	Latitudine Nord	Longitudine Est
A	43° 01' 18"	09° 46' 48"
B	43° 03' 18"	09° 47' 18"
C	43° 03' 24"	09° 47' 48"

Isola di Montecristo		
Punto	Latitudine Nord	Longitudine Est
A	42° 21' 30"	10° 19' 00"
B	42° 20' 54"	10° 20' 12"
C	42° 19' 12"	10° 20' 36"
D	42° 18' 12"	10° 19' 12"
E	42° 18' 24"	10° 17' 24"
F	42° 20' 06"	10° 16' 36"
G	42° 21' 24"	10° 17' 36"

Isola di Gorgona		
Punto	Latitudine Nord	Longitudine Est
A	43° 25' 04"	09° 55' 02"
B	43° 24' 42"	09° 54' 30"
C	43° 24' 39"	09° 53' 36"
D	43° 25' 00"	09° 52' 48"
E	43° 25' 24"	09° 52' 36"
F	43° 26' 18"	09° 52' 48"
G	43° 26' 54"	09° 54' 06"

Isola di Giannutri		
Punto	Latitudine Nord	Longitudine Est
A	42° 16' 15"	11° 06' 30"
B	42° 15' 42"	11° 07' 36"
C	42° 15' 12"	11° 07' 48"
D	42° 14' 36"	11° 07' 24"
E	42° 14' 15"	11° 07' 24"
F	42° 13' 42"	11° 06' 36"
G	42° 13' 51"	11° 05' 45"
H	42° 14' 15"	11° 05' 12"
I	42° 14' 36"	11° 05' 00"
L	42° 15' 42"	11° 05' 06"
M	42° 16' 03"	11° 05' 45"



The sea surrounding Pianosa Island (Fig.01) is considered a Core Area since an access restriction is in effect within a mile and a half around the entire island.

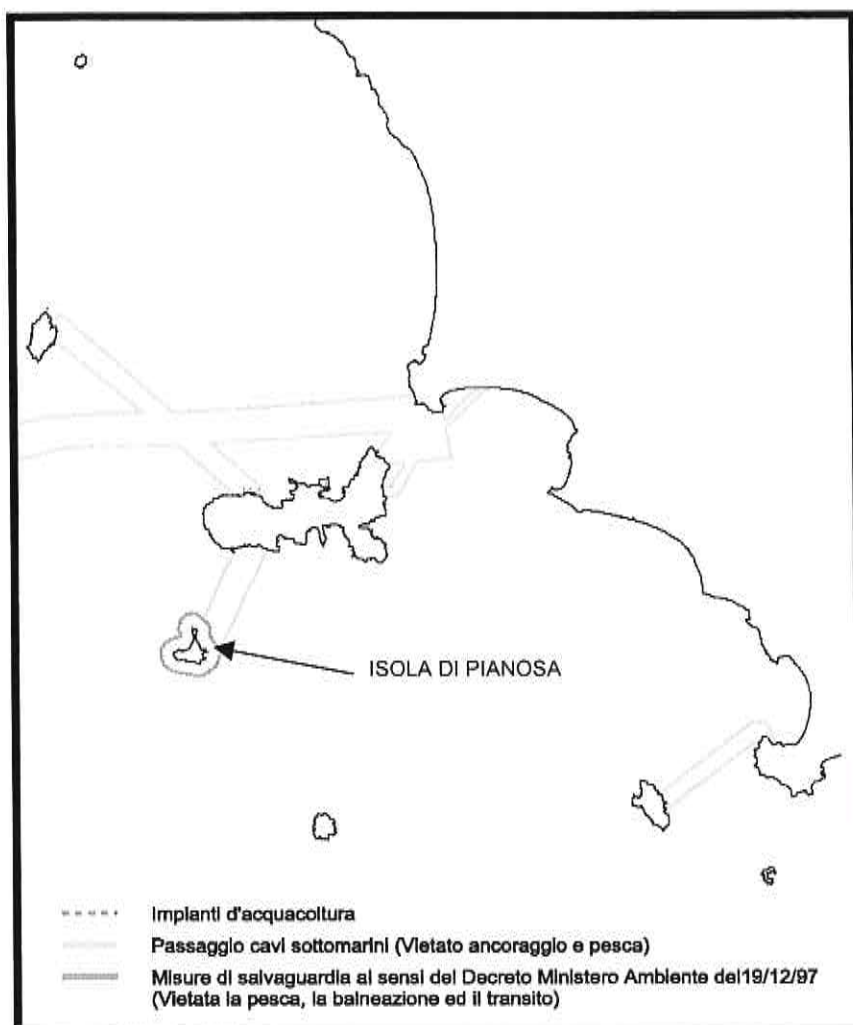


Fig. 01 – Pianosa Island and the TIBR's protection measures

The Buffer Areas are defined by the polygons with the following vertices:

Isola di Capraia		
Punto	Latitudine Nord	Longitudine Est
A	43° 02' 54"	09° 55' 06"
B	43° 00' 18"	09° 54' 18"
C	42° 57' 00"	09° 48' 42"
D	42° 58' 24"	09° 45' 00"
E	43° 01' 18"	09° 43' 18"
F	43° 04' 00"	09° 44' 00"
G	43° 05' 24"	09° 45' 18"
H	43° 07' 18"	09° 49' 54"
I	43° 05' 30"	09° 53' 30"

Isola di Montecristo		
Punto	Latitudine Nord	Longitudine Est
A	42° 23' 54"	10° 19' 24"
B	42° 22' 30"	10° 22' 42"
C	42° 18' 12"	10° 23' 36"
D	42° 15' 48"	10° 20' 06"
E	42° 16' 18"	10° 15' 36"
F	42° 20' 06"	10° 16' 36"
G	42° 20' 30"	10° 13' 18"
H	42° 23' 42"	10° 16' 18"

Isola di Gorgona		
Punto	Latitudine Nord	Longitudine Est
A	43° 25' 03"	09° 59' 24"
B	43° 23' 06"	09° 58' 12"
C	43° 22' 06"	09° 56' 42"
D	43° 21' 45"	09° 52' 24"
E	43° 22' 51"	09° 49' 54"
F	43° 25' 24"	09° 48' 24"
G	43° 27' 21"	09° 49' 00"
H	43° 29' 51"	09° 54' 06"
I	43° 27' 48"	09° 58' 12"
L	43° 26' 18"	09° 58' 48"

Isola di Giannutri		
Punto	Latitudine Nord	Longitudine Est
A	42° 18' 45"	11° 06' 22"
B	42° 17' 06"	11° 10' 21"
C	42° 15' 36"	11° 11' 00"
D	42° 14' 36"	11° 10' 42"
E	42° 13' 36"	11° 10' 39"
F	42° 11' 12"	11° 06' 36"
G	42° 11' 54"	11° 03' 42"
H	42° 14' 15"	11° 02' 18"
I	42° 17' 00"	11° 01' 45"
L	42° 18' 24"	11° 02' 15"
M	42° 15' 10"	11° 01' 27"

The Marine Transition Areas are the sea areas between the islands of the Archipelago.

**7. SIZE AND SPATIAL CONFIGURATION (see map):**

7.1	Size of terrestrial Core Area(s):	1200 ha.
	If appropriate, size of marine Core Area(s):	3000 ha.
7.2	Size of terrestrial Buffer Zone(s):	16400 ha.
	If appropriate, size of marine Buffer Zone(s):	58300 ha.
7.3	Approx. size of terrestrial Transition Area(s) (if applicable):	10900 ha.
	If appropriate, approx. size of marine Transition Area(s):	175000 ha.

Brief rationale of this zonation (in terms of the various roles of biosphere reserves) as it appears on the zonation map :

The TIBR's zonation was designed on the basis of bio-ecological, historical and socio-economical criteria through their comparison and integration, considering in particular:

1. bio-ecological aspects and natural features of the areas inside the Park. We refer to the studies of the area, the identification of naturalistic and geological emergencies, the studies on the territory and the landscape that have identified the principal features as well as highlighted the dynamic phenomena in progress;
2. the presence of sites that are of common interest and pre-existing special protected areas within the boundaries of the Tuscan Archipelago National Park;
3. compatibility of human activities with conservation goals, both with a view to Law 394 and to the characteristics of the Tuscan Archipelago Park;
4. degree and quality of human activities inside the Park, most importantly of the inhabited centers and the relation to the provisions of the Local Urban Development Plans;
5. degree and quality of tourist use of the areas inside and outside of the Park;
6. social expectations expressed by the local Authorities and management planning in progress on the part of the Park Authority;
7. easy identification of and compliance with the boundaries.

**8. BIOGEOGRAPHICAL REGION:**

[Indicate the generally accepted name of the biogeographical region in which the proposed Biosphere Reserve is located. You may wish to refer to the map of the World Network of Biosphere Reserves presenting 12 major ecosystem types.]

Mediterranean coastal/marine zone



## 9. LAND USE HISTORY:

[If known, give a brief summary of past/historical land use(s) of the main parts of the proposed biosphere reserve]

The first traces of human presence on the islands of the Tuscan Archipelago date back to the Paleolithic period. The island of Elba was settled by the Etruscans who used its natural resources, in particular copper and iron, thus starting a long tradition of metal working. Occasionally, the island was also inhabited by Greeks, who called it "Aethalia" after the soot produced by the initial working of the iron ore. The Romans, who dominated the territory for several centuries, continued to exploit the island's great mineral wealth and established the first commercial outposts on each island of the Archipelago. After the end of the Roman rule, the islands experienced a substantial decline in commercial traffic and a serious demographic crisis that resulted in the depopulation of almost the entire area. Later, the first Christians began to resettle the area, basing themselves on the island of Pianosa. During the second millennium, the Pisans, the Genovese and the Appiani of Piombino constructed important religious buildings as well as military defense structures. The French emperor Napoleon Bonaparte carried out significant projects and works that benefited the island's economy and culture. Following the Second World War, Elba's social and economic structure experienced a significant change: ore extraction activities ceased and the metal working plants of Portoferraio were destroyed. Today, the most important economic activity of the entire Archipelago is tourism. The environment of the Tuscan islands has been influenced by human activity since at least the Eneolithic Period (5000 years ago), without considering the profound changes in progress since the Upper Paleolithic. A strong tendency towards the pastoral exploitation of the inaccessible areas of Mount Capanne for the purpose of producing milk, meat and leather is associated with the poorness of the vegetational cover of the mountain's southern and western slopes, which have been exploited intensively for centuries. The system of burning forests in order to obtain fertile pastures (slash and burn) dates back to the shepherds of the Bronze Age. It seems that between the ninth and the eighth centuries, with the development of the city, Elba was slowly drained of its population. Recent excavations and research could show that during that period (eighth century) Elba was inhabited by social groups that began to exploit the island's primary resource: iron. During this period, the islands probably received their first names: Aithaleia (Elba), Aigilon (Capraia), and so on. Matters started changing considerably in the fifth century, when with their progressive loss of control of the seas, the major city states of Magna Graecia and of Sicily began to turn to the Tyrrhenian. This period saw a phase of intense impact on the environment with a continuous and incisive removal of the islands' vegetational cover. Next, what remained of the primary forests was cut down considerably in order to obtain the long tree trunks indispensable for the construction of ships and of the public buildings of Populonia. Later, indiscriminate cutting affected also areas of secondary vegetation, and even today, the areas with the highest density of settlements and productive structures show a degraded vegetational cover. With the start of the modern age, local cultures began to form whose heritage and details can still be perceived today. Until just a few decades ago, the agricultural landscape of the Tuscan Archipelago (and in particular of Elba) was primarily characterized by farming: in the alluvial valleys, cereal cultivation and, to a lesser extent, fruit and vegetable cultivation was common. The slopes of the hills, particularly those facing the sea, were terraced



over the centuries and turned into vineyards and, in some parts, olive groves. Vine growing and wine production were the supporting branch of the main islands' agriculture, and the products were mostly exported to the mainland.

	Urban	Rural area	Agriculture	Abandoned land	Grazing	Forestry	Natural area	Mines	Total area
TIBR	1692 (6%)	337 (1%)	3171 (11%)	2172 (7%)	1063 (4%)	13815 (48%)	6417 (22%)	364 (1%)	29031
Archipelago National Park	194 (1%)	30 (0%)	1212 (7%)	759 (4%)	601 (3%)	9839 (55%)	4872 (27%)	294 (2%)	17801

Table 01 Land use of the TIBR and the Tuscan Archipelago National Park, all the values are expressed in hectares. The percentage values are referred respect to the total area.

After the Second World War, the agriculture of the Tuscan Archipelago lost many of its traditional features. Most noticeably on Elba, Giglio and Capraia, the arrival of tourism, even though a seasonal activity, has resulted in a reduction of "commercial" agricultural businesses, leading to a substantial change of the agricultural landscape, which more and more resembles an urbanized countryside. In addition, a good part of the terraces has been abandoned over the past forty years, leading both to a noticeable loss of surfaces cultivated with vine and to repercussions for the landscape and environmental characteristics. The terraces have slowly been invaded by Mediterranean maquis. Their abandonment has lead to a progressive alteration of the complex hydrological balance of the hill areas with significant repercussions in an area where the precipitation pattern is characterized by a strong concentration of rain in the autumn and dryness in the spring and summer. The ratio of Useable Agricultural Area (or UAA) to Total Agricultural Area (or TAA) is in the medium-low range with a variation from 14 to 54% (meaning that between 86 and 46% of the surface area cannot be cultivated); the average UAA of each business is extremely low, even compared to other marginal areas, with between 0.4 and 3.0 ha/business.

## 10. HUMAN POPULATION OF PROPOSED BIOSPHERE RESERVE:

[Approximate number of people living within the proposed biosphere reserve]

		permanently / seasonally
10.1	Core Area(s):	0 / 0
10.2	Buffer Zone(s):	2.000 / 6.000
10.3	Transition Area(s):	28.822 / 56.000

### 10.4 Brief description of local communities living within or near the proposed Biosphere Reserve:

[Indicate ethnic origin and composition, minorities etc., their main economic activities (e.g. pastoralism) and the location of their main areas of concentration, with reference to a map if necessary]

The ethnic origins of the population of the Tuscan Archipelago are unclear. The use of the islands within a maritime culture, the frequent invasions and depopulations which followed each other over time, all make it difficult to find a well defined line of origin. From a historical point of view, the most important ethnic groups are the Italics and the Etruscans, with strong Greek, Roman and Longobardic influences. The Saracen influence must not be neglected, either. The current population of the islands has a strong Tuscan ethnic and cultural traditions, since they are firmly connected to the commercial activities and trade with the nearby coast. There are no ethnic minority groups of any social importance, with the exception of the very recent immigration (partly illegal) which has had and continues to have a certain impact on the demographic structure of the Archipelago's local population. The Archipelago's productive and occupational structure depends on rather varied trends of different sectors. The main tendencies within the three great productive sectors show a growing trend towards the tertiary sector with a progressive reduction of the primary. The secondary sector shows opposing trends in its various branches, all of which confirms a recent model that is extremely dependent on the development of tourism. The industrial / manufacturing sector employs approximately 17% of the population, mainly in construction, food and mining industries. The entire primary sector employs approximately 2.5% of the population, mostly in fishing. Finally, the tertiary sector provides work to approximately 80.3% of the population, with the highest concentration in the tourism / hotel sector and the retail sector.

### 10.5 Name(s) of nearest major town(s):

Portoferraio (Isola d'Elba), Piombino, Livorno, Grosseto

### 10.6. Cultural significance:

[Briefly describe the proposed Biosphere Reserve's importance in terms of cultural values (religious, historical, political, social, ethnological)]

The Archipelago's settlement structure is strongly characterized by the consolidation of the "Mediterranean" model based on the historical collaboration between the land

activities (agriculture and mining) and the sea activities (trade and fishing). As everywhere along the Mediterranean coast, the double structure land / sea is shaped according to the geomorphologic conformation of each location in order to allow maximum use of the resources and at the same time ensure certain essential prerequisites: safety (sheltered and fortified hilltop towns), access to fresh water (for human use and for the working of minerals), the connection with the mainland and with the sea routes of the Mediterranean (a system of landing places and ports). This underlying structure is still clearly visible in the Archipelago, despite the complex historical events that have affected the islands over the centuries, alternating between phases of abandonment and repopulation, up until the most recent incisive phase of touristic urbanization. Concerning historical wealth, the TIBR will contain 30 prehistoric sites, often in very panoramic locations, numerous Etruscan sites connected to mining activities and established in defensive positions, and a number of Roman finds mainly connected to patrician villas (partly connected to the control of mining activities). Outstanding examples among these are the Roman Villa of the Caves at Portoferraio, the areas of Monte Castello and Campo dell'Aia at Procchio, the Roman Villa at Cavo, the Luceri Fortress at Colle Reciso, the Villa della Cala Maestra on Giannutri, the sites of Capel Rosso and Vigna Vecchia, the Roman ruins at the port of Giglio, the catacombs and the Villa of Agrippina on Pianosa. The numerous evidence of the defensive system should not be forgotten either (the Medici fortresses of Portoferraio and Porto Azzurro, the fortress of Volterraio, the fortress of S. Piero in Campo, the towers and castles of Marciana and S. Piero in Campo, Fort Falcone, Stella della Linguella, Fort Focardo at Capoliveri, Fort del Giogo at Rio on Elba, the Castle of Giglio, the fortress of Gorgona, the fortress of San Giorgio on Capraia) as well as the many sighting towers spread along the coast. There are numerous religious structures, such as the Madonna del Monserrato at Porto Azzurro, San Lorenzo at Marciana, the Madonna della Grazia at Capoliveri, Santa Lucia at Colle Reciso, Santo Stefano delle Trane at Magazzini, the Madonna delle Nevi at Lacona, the Hermitage of San Cerbone on Mount Capanne and the ruins of the Holy Convent on Montecristo.



## 11. PHYSICAL CHARACTERISTICS

### 11.1. Site characteristics and topography of area:

[Briefly describe the major topographic features (wetlands, marshes, mountain ranges, dunes etc.) which most typically characterize the landscape of the area.]

The Tuscan Archipelago, located between the Tuscan coast and Corsica, consists of seven main islands and some minor islets (Fig.02). In order from North to South, the main islands are: Gorgona, Capraia, Elba, Pianosa, Montecristo, Giglio and Giannutri. The most important of the islets and rocks are: Palmaiola and Cerboli, near Elba in a north-eastern direction; Formiche di Grosseto, north of Giglio; the Rock of Africa or Formiche di Montecristo, west of Montecristo; Formiche di Capraia, di Palmaiola, della Zanca. The Archipelago has 249 km of coastline, of which 147 km belong to Elba.

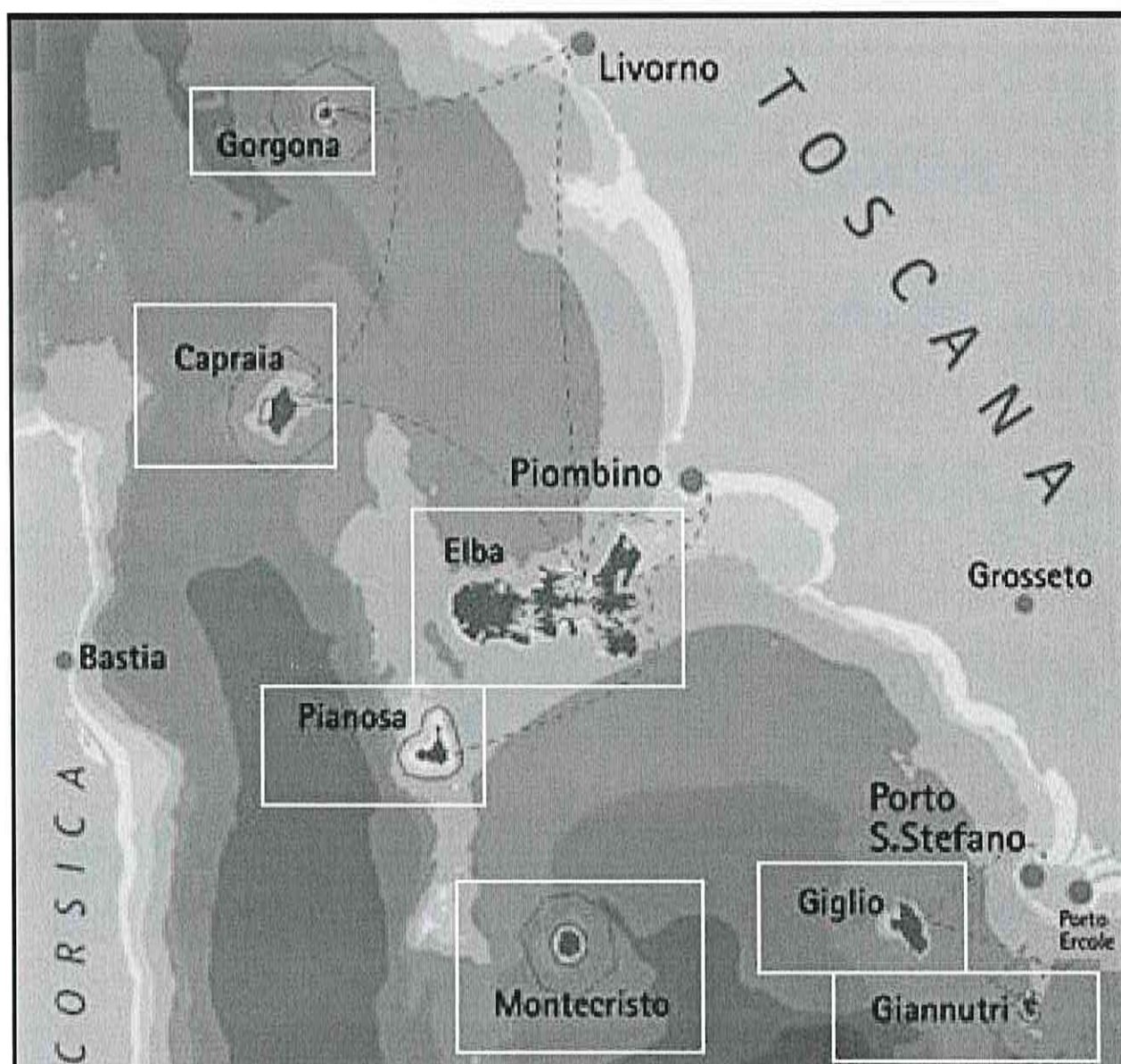


Figure 02 – The islands of the TIBR Tuscan Islands Biosphere Reserve



11.1.1 Highest elevation above sea level:	1018 m
11.1.2 Lowest elevation above sea level:	0 m
11.1.3 For coastal/marine areas, maximum depth below mean sea level:	340 m

## 11.2. Climate:

[Briefly describe the climate of the area using one of the common climate classifications]

The climate of the islands of the Tuscan Archipelago essentially complies with the Mediterranean-type system of atmospheric circulations, which is characterized by air masses of tropical maritime origin in the summer alternating with air masses of polar maritime origin in the winter, with spring and autumn as transitional seasons. The articulated orography and the presence of some high mountains add a greater complexity to the islands' climate. Overall solar radiation, measured at the weather stations on Elba and Pianosa, is 375 and 351 cal/cm<sup>2</sup>/day, respectively. These are very elevated levels, higher than those measured on the Tuscan mainland and in many coastal centers of Southern Italy and the Italian islands. The mean annual temperature on Elba is approximately 15°C, an average determined by mild winters (8-9.5°C) rather than by elevated summer temperatures (22-23°C). Nevertheless, on Mount Capanne, at altitudes above 1000 m, it is not uncommon for temperatures to fall below 0°C, while the highest temperatures are naturally achieved in the coastal regions, which have the lowest elevation and are under the constant influence of the sea. The range of the mean annual temperature is between 15-17°C (15.1°C at Portoferraio and 17°C at Poggio). The temperature ranges, which vary according to elevation and distance from the sea, are lower than those measured on mainland Tuscany for locations at the same distance to the coast. Overall, temperatures rise from North to South. Precipitation falls within a typical Mediterranean trend and is relatively homogenous in the entire territory, with maximum levels in autumn (October) and minimum levels in summer (July). Variation in the amount of precipitation is naturally quite great, with levels ranging from 940 mm annually in the more humid zones to 556 mm annually in the drier areas. Variation from one year to another can be quite marked, so much so that in some years there has been snow on the summit of Mount Capanne.

Applying Emberger's climatic system to the TIBR has made it possible to detect four climate types distributed within the six great geomorphologic systems. In particular, these are:

- a) *humid Mediterranean with cool winters*, characteristic of areas at an elevation of above 600 m;
- b) *humid Mediterranean with mild winters*, on the medium-low slopes on the northern side of Mount Capanne, with mild temperatures and abundant precipitation;
- c) *sub-humid Mediterranean with mild winters*, representative of the islands' overall climate with the exception of the aforementioned areas, the coastal plains and the coasts, with more humid variations based on exposure or with cooler winters based on altitude;

d) *sub-humid Mediterranean with warm winters*, characteristic of the coastal plains and the coast often exposed to the south, with marked dryness in the summer and reduced winter stasis of the vegetation.

11.2.1 Average temperature of the warmest month: from 17.1 to 23 °C

11.2.2 Average temperature of the coldest month: from 3.4 to 9.5 °C

11.2.3 Mean annual precipitation: 940 mm, recorded at an elevation of 240 m  
556 mm, recorded at an elevation of 25 m

11.2.4 If a meteorological station is in or near the proposed Biosphere Reserve, indicate the year since when climatic data have been recorded:

Three main automatic weather stations exist at present in the TIBR. Two of those, located in Portoferraio and on the Island of Gorgona, are part of the ARSIA Regional Weather Network. A third station is managed by the National Research Council (CNR IBIMET) on the Island of Pianosa and has a satellite connection for automatic data download.

Weather station of Portoferraio:

Automatically: 1990

Name and location of station: Portoferraio (UTM: E 611200, N 4739200; Elevation 8 m )

Weather station of Isola di Gorgona:

Automatically: 1990

Name and location of station: Gorgona (UTM: E 572400, N 4808900; Elevation 255 m)

Weather station of Isola di Pianosa:

Automatically: 2000

Name and location of station: Pianosa (UTM: E 588585, N 4715595; Elevation 9 m)

### 11.3. Geology, geomorphology, soils:

[Briefly describe important formations and conditions, including bedrock geology, sediment deposits, and important soil types]

Within the Italian naturalistic contest, the TIBR is characterized by the presence of numerous types of sedimentary, igneous and metamorphic rocks found in a relatively small area. The Archipelago is also considered a key area for the reconstruction of the geological evolution of the Alpine and Northern Apennine orogenic systems. Indeed, on its islands we find the easternmost parts of the Apennine chain, which developed during the Upper Oligocene through the piling up of elements coming from the sea basin existing in the Liguria / Piedmont region during the Mesozoic Age. Moreover, among the oceanic elements there are successions characterized by metamorphosis due to high pressure and low temperatures, which have been linked to those typical for the alpine regions of Corsica (Schistes Lustrés). The importance of this area is further increased

by the numerous evidence of the magmatic events of the Miocene, both in the form of pluton dike granitic (e.g. Mount Capanne on Elba) and of volcanic complexes (e.g. the island of Capraia), connected to the thinning of the crust on the back of the chain, which by means of a system of regular faults at low and high angles caused the opening of the Tyrrhenian basin during the Myocene

A brief geomorphological description of the TIBR is given below outlining the main isles:

### Elba

The morphological complexity of Elba is remarkable. Mountains of various elevations alternated with numerous valleys and small coastal plains. Approximately 1/3 of the island's surface area is at an elevation of above 200 m, and 3/4 of the island lies more than 50 m above sea level. Thus the island is for the most part mountainous: with the exception of Mount Capanne (1018 m above sea level), the elevations are not particularly high and remain at altitudes below 1000 meters. In addition to Mount Capanne, there are Mount Calanche (905 m), Mount Giove (855 m) and Mount Perone (630 m), which represent the highest altitudes of the island. The central part lies between the Fosso Galeo Valley in the west and the Fosso Valdana in the east; in general, this part contains the lowest altitudes on Elba. The main elevations are Mount Poppe (248 m), Mount Orello (377 m) and Mount Tambone (379 m). The western part is characterized by two imposing features: the mountain ridge of Mount Strega (427 m) and Cima del Monte (516 m) in the north-east, and the promontory of Mount Calamita in the south-east, separated by the Plain of Mola stretching out in an east – west direction. The overall hydrographic network is not very developed considering the rather uneven morphology and the small size of the island. The watercourses are for the most part torrential streams that have cut out narrow valleys with steep sides. The largest flood plain, the plain of Marina di Campo, covers an area of 4 km<sup>2</sup>, separating Mount Capanne from Mounts Tambone and S. Martino. The shoreline reflects the rugged morphology of the island, and over 2/3 of it are high and rocky, while small beaches can be found near the mouths of some minor rivers.

### Gorgona

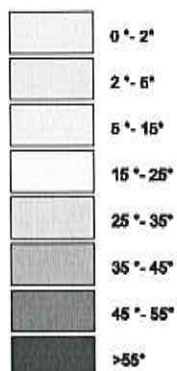
Gorgona is entirely mountainous (Punta Gorgona: 255 m above sea level), its western part is steep, almost vertical, while its eastern side slopes down gradually with various undulations. Landing is possible at Cala dello Scalo on the eastern coast.

## OROGRAPHY OF THE TIBR ISLANDS

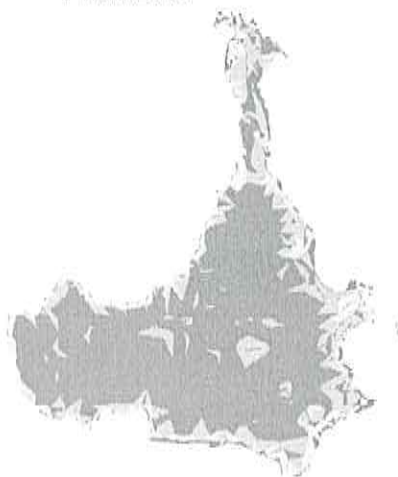
### Legenda

#### Classi di pendenza

(Tratta da : Manual of Detailed Geomorphological Mapping; Demek J. 1972)



PIANOSA



GORGONA



GIGLIO



GIANNUTRI



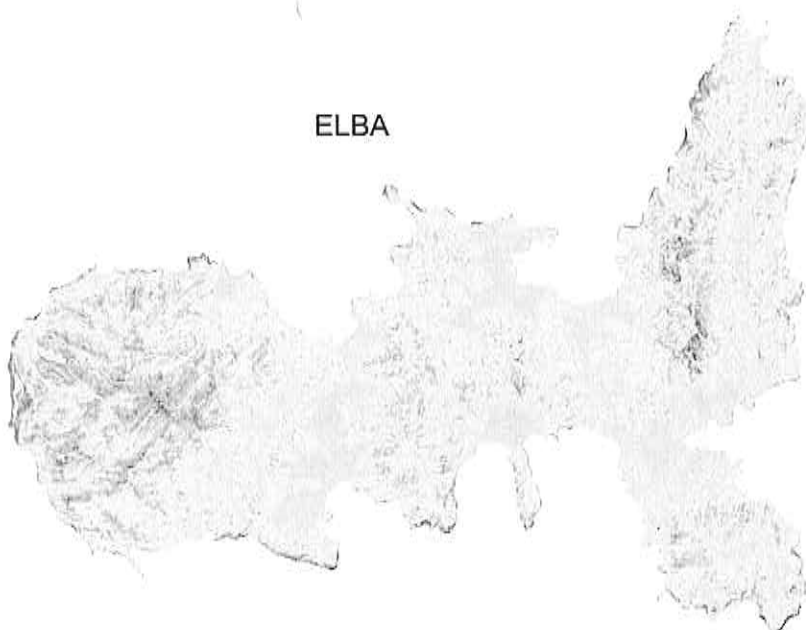
MONTECRISTO



CAPRAIA



ELBA





### Capraia

Capraia is completely mountainous and is divided north to south, up to 1 km from the sea, by a chain of mountains with altitudes around 400 m above sea level, the most important of which are Mount Castello (445 m) and Mount Arpagna (410 m). The western face is steep, while the eastern side presents small valleys cut out by ephemeral streams ("wadi") which descend gently towards the sea. The coast is mostly rocky and inaccessible with numerous caves opening to the sea. The existing small watercourses are numerous in relation to the island's surface area but are all seasonal streams. They generally flow in an east – west direction, that is, they spread out like a comb from the watershed and move towards the sea. Capraia even has a small lake called "lo Stagnone" or "il Laghetto" (318 m above sea level), it is located between Mount Forcone and Mount Rucitello and is of elliptical shape. It is circa 104 m long and 50 m wide, with the longer diameter oriented in an east – west direction, and covers approximately 0.5 ha. The depth exceeds one meter only during very rainy periods when the lake is full; in general, the water occupies only little more than half of the full surface of the lake. Its feeding system is probably mixed, comprising meteoric elements and ground water. Lo Stagnone is the only natural lake of the entire Tuscan Archipelago.

### Pianosa

Called "Planasia" by the Romans, it owes its name to the levelness of its surface, with the highest altitude a mere 29 m above sea level (Punta Brigantina, Belvedere). Its conformation is thus extremely different from that of the Archipelago's other islands. Landing is possible at the small port of the little peninsula on the eastern coast, near which there is the rock La Scola (34 m). Another rock, La Scarpa, emerges a short distance from the Punta del Marchese on the north end of the island. The Bay of S. Giovanni is located on the eastern coast of Pianosa. The island has some natural caves.

### Montecristo

Montecristo consists of a single mass which emerges from the sea at an almost constant angle of 25° for the most part of its profiles, reconstructed in various sections, and culminates in three summits, the highest of which is Mount della Fortezza at 645 m. The coast is precipitous and jagged on all sides with numerous inlets; the main inlet is Cala Corfù along the south-east part, which is almost a large abyss, inaccessible at any point. The only landing possibility is offered by the Cala Maestra at the mid-point of the western coast. 10 km to the west of Montecristo is the Scoglio d'Africa or Formica di Montecristo, a small rocky bank.

### Giglio

Giglio, entirely mountainous, culminates in the Poggio della Pagana (496 m). The coasts are inaccessible except at the bays of Arenella, Giglio Porto and Canelle on the eastern coast, and at Campese in the north-west, which has the largest beach. Distinguishing elements are the Punta di Capel Rosso (31 m) and, in the south-western region of the island, the Valle del Catinello. Its main watercourses are the Vado della Botte, whose first part is called Vado del Molino, and the streams of the Valle del Dobbiarello, of the Ortana, of S. Antonio and of the Corvo.

Giannutri

Giannutri culminates in three hills, Capel Rosso (88 m in the south), M. Mario (78 m in the north-west) and Cannone (68 m in the north-east), which are linked by a low-lying piece of land that reaches 29 m above sea level and ends almost everywhere in rocky escarpments. The coast is almost entirely rocky with only two small gravel beaches in the Cala dello Spalmatoio in the north-east and in the Cala Maestra in the north-west

## 12. BIOLOGICAL CHARACTERISTICS

[List main **habitat types** (e.g. tropical evergreen forest, savanna woodland, alpine tundra, coral reef, kelp beds) and **land cover types** (e.g. residential areas, agricultural land, pastoral land). For each type circle REGIONAL if the habitat or land cover type is widely distributed within the biogeographical region within which the proposed Biosphere Reserve is located to assess the habitat's or land cover type's representativeness. Circle LOCAL if the habitat is of limited distribution within the proposed Biosphere Reserve to assess the habitat's or land cover type's uniqueness. For each habitat or land cover type, list characteristic species and describe important **natural processes** (e.g. tides, sedimentation, glacial retreat, natural fire) or **human impacts** (e.g. grazing, selective cutting, agricultural practices) affecting the system. As appropriate, refer to the vegetation or land cover map provided as supporting documentation.]

### TERRESTRIAL ECOSYSTEMS AND HABITATS

#### Terrestrial Ecosystems

Due to their geographical and phytoclimatic location, the Archipelago's islands are mainly covered by evergreen Mediterranean vegetation types (more or less xerophilous sclerophytes). With the exception of Mount Capanne on Elba, the altitude of the islands is on average low and does not show significant variations in the physiognomy of the vegetation. The climatic features and the knowledge of the history and dynamics of the current vegetation make it possible to reconstruct a potential previous vegetation based on the following two area types:

1. Thermophilic and xerophilous coastal scrubs and maquis with a predominance of juniper and tree spurge;
2. Evergreen forests dominated by ilex.

Only the summit of Mount Capanne presents the necessary conditions for the development of a vegetation characterized by thorny shrubs with the presence of oro-Mediterranean species. In addition, on the northern side of the mountain, which is less sunny and dry, local conditions are favorable to the survival of xeromorphic deciduous species in the form of pubescent oak forests. On the other hand, the presence of forest species such as chestnuts and maritime pines must be considered the result of human introduction. The actions of men have greatly reduced the amount of original forest vegetation in favor of degraded stages (maquis, garigue, therophyte fields), cultivations, reforestation and ornamental green spaces. The remaining spontaneous vegetation has been degraded to types with reduced biomass, structurally less developed, dominated by heliophyte and xerophilic species rather than the nemoral skiophylous plants prevalent in the original forests. The current situation of the Archipelago's vegetation is a mosaic of types predominantly determined by human intervention. Based on the knowledge acquired, it may be divided into zonal vegetation, determined primarily by the climatic conditions of a location and more or less modified by human actions, and azonal vegetation determined mainly by the particular ecology of the transplantation locations.

#### **Zonal vegetation**

##### Evergreen sclerophyte forest.

These represent what is left of the original forest vegetation. They are rarely forests of trees with high trunks, but rather coppice or evolved forms of maquis with the presence of evergreen trees or bushes. Some islands do not have any true forests (Montecristo, Capraia, Pianosa, Giannutri, Formiche). Only Elba retains any appreciable forest cover

as far as surface area is concerned, but some remnants of forests can still be seen in limited areas on Giglio and Gorgona. In phyto-sociological terms, the most common association is the ilex mesophile grove *Viburno tini Quercetum ilicis*, often found in the subassociation *ericetosum arboreae* as a result of repeated fires followed by grazing. There are very sporadic and localized appearances of the ilex deciduous grove *Fraxino orni Quercetum ilicis* in relatively more cool and fresh locations and that of humid gorges (*Asplenio onopteridi Quercetum ilicis*).

#### The evergreen maquis and scrubs

These are the degraded forms of the evergreen forest vegetation. The first level of degradation is generally represented by evolved maquis (2-5 m) of tree heath and strawberry tree (*Erica arboreae* and *Arbutetum unedo*), with or without phyllirea (subassociation *phillyretosum latifoliae*). On some islands (e.g. Montecristo), grazing has been so intensive that it has resulted in an abundance of the less appetizing tree heath (*Cladonio Ericetum arboreae*). Following repeated fires, accompanied by erosion and washing out of the soil, greater levels of degradation are reached, which are characterized by smaller numbers of trees and bushes in the maquis and by the infiltration of heliophyte species, mostly bushes, fruticous and suffruticous. These predominantly fruticose degraded types are sometimes classified as subassociations of the maquis of tree heath and strawberry tree, but due to the noticeable physiognomic and floristic differences they should be grouped floristically with the alliance *Cisto cretici Genistion corsicae* Arrig. et Di Tommaso (1991) or with the alternate *Cisto Ericion* Horvatic (1958). In addition, they have much in common with the more sparse low brush or garigues.

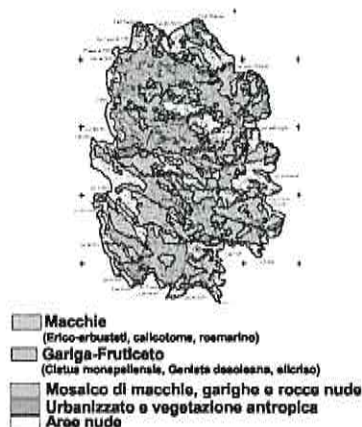
#### The coastal thermophilous bushes

Mediterranean vegetation shows two levels. One is a mesophile level of evergreen sclerophytes, potentially dominated by sclerophyte forests, generally with a predominance of ilex, which is mostly found in the western and northern regions of the Mediterranean. The other one, more thermophilous and xerophilous, is potentially more represented in the central, eastern and southern Mediterranean. The species at this thermo-xerophilous level are generally small xeromorphic trees, often with a winter growth cycle and a summer resting phase in correspondence to the dry season. In the Archipelago, this second level is found only in the coastal zones or on warm and dry south-facing slopes. The most widely spread types of vegetation are maquis (1.5-3 m) consisting of myrtle or mastic trees (*Myrto – Pistacietum lentisci*) or the more heliophyte and degraded types of *Calicotomo* and *Myrtetum* and bushes of coastal juniper (*Phillyreo angustifoliae*, *Juniperetum turbinatae* and *Teucro*, *Juniperetum phoeniceae*) or of tree spurge (*Oleo Euphorbietum dendroidis* and *Myrto Pistacietum lentisci euphorbietosum*). These coastal plants often grow on coastal slopes that are rocky and steep and often act as shelters for rare thermophilous plants (e.g. *Chamaerops humilis* L., *Brassica incana* Ten., *Anthyllis barba jovis* L., etc.). Due to the locations they occupy, these coastal brushwoods are often types of vegetation little affected by human activities and are actually primary vegetation. Their importance for the conservation of the floristic and ecological diversity is obvious.

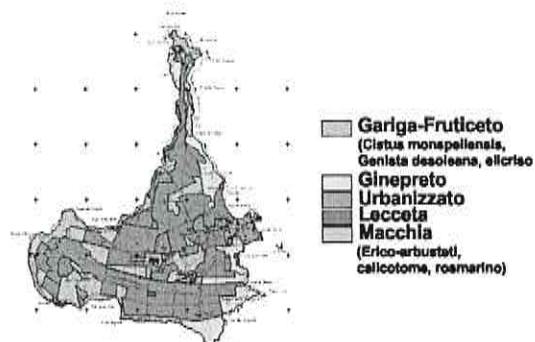


## VEGETATIONAL MAPS OF THE TIBR ISLANDS

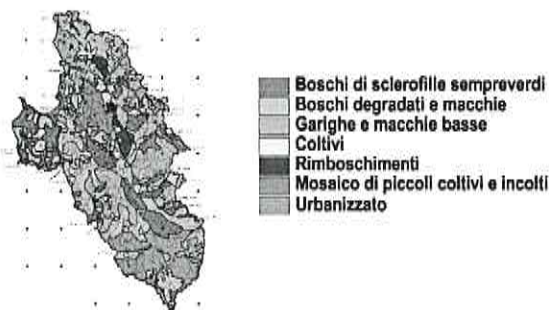
MONTECRISTO



PIANOSA



GIGLIO



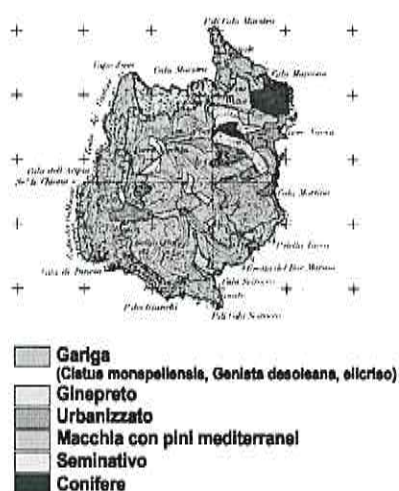
CAPRAIA



GIANNUTRI



GORGONA



### Low maquis and garigues

The destruction of the forest cover of evergreen sclerophytes, often accompanied by the degradation of the soil and the stripping of the subsoil encourage the infiltration of a large number of heliophyte, suffruticous, fruticous and herbaceous species that characterize the stage of the reconstruction of a high, woody vegetational cover. These species, which are generally pioneers and highly adaptable, are xerophilous perennials or annual grasses with a winter growth cycle. They can generally be divided into a silicicolous group, a calcicole group and a group which is indifferent to the nature of the subsoil. The calcicole group can generally be categorized as belonging to the phytosociological class of the *Rosmarinetea*, the silicicolous group to the *Cisto Lavanduletea*. The former create associations of low bushes dominated by *Rosmarinus officinalis*, *Erica multiflora* and species of the Genus *Cistus*, the latter, on the other hand, are characterized by silicicolous species such as *Erica arborea*, *Lavandula stoechas* and *Cistus salvifolius*. The class of the *Rosmarinetea* is found on Giannutri, Capraia and partially Gorgona and Giglio, that of the *Lavanduletea* is mostly found on Montecristo, Elba and Giglio.

### Therophyte fields

In the Mediterranean region, the herbaceous vegetation is mostly represented by annual species (therophytes), generally with a winter growth cycle with rapid growth beginning in late winter or early spring and a rest period in the summer during the seed stage. In an area where the potential vegetation is made up of woody species, therophyte fields represent the last stage of the degradation cycle caused by human action through eradication, cultivation, fires and intense and repeated grazing. The great adaptability and equal strength of the therophytes make it difficult to characterize the various floristic compositions of the seasonal Mediterranean fields, particularly since the predominance of individual species is often determined annually by the seasonal climate. It is problematic to identify generally valid types of the herbaceous vegetation of the Archipelago on the basis of today's knowledge. Indeed, those described by Filipello and Sartori (1981) for the island of Montecristo are characterized by the presence of suffruticous plants.

### Forest of deciduous hardwood trees

These are rare in the Archipelago and are found practically only on Elba, on the northern slopes of Mount Capanne. Here we find deciduous oaks and chestnuts on the cooler slopes, often mixed with ilex on the dryer ridges. The chestnuts are most likely the result of earlier introduction by humans. The scarce availability of surveys does not permit a secure syntaxonomical definition of the forests of this area, which also seems to contain some nemoral and marginal flora.

## **Azonal vegetation**

### Lithophile and chasmophile aereohaline vegetation

The coasts of the Archipelago's islands are mostly rocky, battered by the wind, stripped by wind erosion, submitted to spraying sea water. Above the maximum level reached by the waves, the first vegetation is by force composed of a few halophytes, in particular *Crithmum maritimum* and a *Plumbago inacea* of the genus *Limonium*. With the exception

of Capraia, where we find the triploid *Limonium contortirameum*, the other *Limonium* species of the Archipelago are diploid and, due to the insular isolation, show a diversity specific to particular islands: *L. sommierianum* (Giglio, Giannutri, Montecristo), *L. doriae* (Formicagrande), *L. ilvae* (Elba, Palmaiola, Cerboli), *L. planasiae* (Pianosa), *L. gorgonae* (Gorgona). These vicarious species differentiate as many microassociations typical of the coastal halophilous border.

#### Psammophilous vegetation

Due to human actions, the vegetation of the dunes on the shores has been mostly removed or impoverished on the few beaches of the Archipelago's islands. Indeed, today it is completely lacking on Gorgona, Capraia, Montecristo, Giannutri and Giglio. Only Elba and Pianosa retain some more or less degraded remnants of this type of vegetation, which is becoming more and more rare on our shores. The psammophilous vegetation types which grow on the more inland dunes and backdunes are lacking completely.

#### Coastal garigues

On some of the islands' high rocky coasts, a line of lithophile fruticous and suffruticous has developed above the aerohaline vegetation, which is growing on the more or less stripped surfaces. Among those, *Helichrysum litoreum* stands out physiognomically because of its abundance. This lithophile vegetation can be considered as belonging to associations linked to *Anthyllidion*. In less rocky and steep environments, sometimes on gravelly detritus, we can also find associations of the *Crucianellion*, which however present clear floristic affinity with the psammophilous vegetation growing on the backdunes.

#### Coastal vegetation of biennial or perennial high grasses which are phospho-nitro-halophilous

These are disturbed secondary vegetation types of uncultivated coastal areas; they are generally nitrophilous and relatively halophilous.

#### Chasmophilous and lithophilous vegetation

This type of vegetation has a certain significance, because the rocks often are home to associations that are little disturbed by human activity and that are rich in rare species. Even though there are no rock formations caused by great faults in the Archipelago, there are nevertheless small and fragmented high rocky areas, both siliceous and calcareous. Unfortunately, for many of the islands there is little information about this type of vegetation.

#### Vegetation on the stillicidious cliffs

This is a very localized type of vegetation, growing where there are small sources of water, in shady and rocky locations, but also on wet rocks. There are not many locations with these conditions on the Archipelago's islands except perhaps on Elba and Montecristo.



### Formation of floating and rooting hydrophyllous vegetation

There is an almost complete absence of permanent freshwater bodies (lakes, marshes, rivers) in the Archipelago. Therefore, freshwater vegetation is extremely rare. One example is the Stagnone on Capraia.

### Terrestrial Habitats

Based on what has already been said about the vegetation types present in the Archipelago (vegetational diversity) and the general tendencies of the vegetational cover, the analysis of the vegetation community and of the habitats cannot be separated. Let us remember that the habitats that have a tendency to be more stable are those that have evolved and preserve themselves in areas little susceptible to use by humans. Forest habitats are little represented and have often been damaged by fires. Use of a large part of the territory for grazing and the necessity of the population to obtain firewood have for centuries, until the beginning of the 20<sup>th</sup> century, caused the almost complete disappearance of the forest covers, leading to serious soil degradation in the territory.

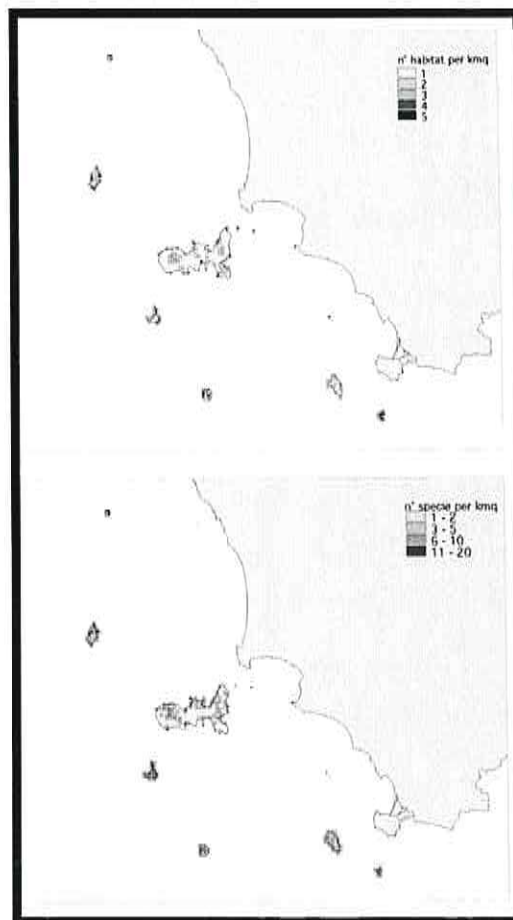


Figure 03 – Habitats and rare species density in the TIBR



Recently, the strong reduction of grazing and the tendency to abandon large agricultural surfaces have inverted the tendency for the reduction of the forest areas. However, there is always the danger of fires, mostly due to the increased recreational tourism during the summer months. Particularly on Elba and Giglio, reforestation has produced a considerable conifer cover, particularly of Mediterranean pine. It must be noted, though, that these softwood forests are at a greater risk for fire damage than sclerophyllic forests. Still, the fact remains that the forest cover of the Archipelago is very scarce and must be increased. In our opinion, this should take place by recuperating degraded areas and reforestation in the areas now covered by Mediterranean maquis. The few existing humid areas warrant particular attention, since the vegetation growing there is very rare in the Archipelago, as it is indeed in all the Mediterranean region. In addition, we note the precarious state of the surviving psammophilic vegetation, which has been removed or greatly degraded almost everywhere due to tourist use of the sandy beaches. The coastal growths of junipers (*Juniperus turbinata* and *J. macrocarpa*) are very important because of their rarity, but also because of their stability and their considerable value to the landscape. They require particular protection.

#### DISTRIBUTION

12.1. First type of habitat/land cover:

Local

##### Vegetation of rocky coasts

Discontinuous vegetation dominated by aerohaline. chasmophytes growing all along the rocky shoreline of the Archipelago. This type of vegetation comprises various associations and subassociations, each of which is differentiated by endemic species belonging to the genus *Limonium*.

12.1.1 . Characteristic species:

*Limonium* spp

12.1.2. Important natural processes:

mostly undisturbed

12.1.3. Main human impacts:

tourism

12.1.4. Relevant management practices:

none

#### DISTRIBUTION

12.2. Second type of habitat/land cover:

Local

##### Vegetation of coastal drift lines

Ephemeral halo-nitrophilous vegetation, whose presence in the Archipelago is reported at the Lacona beach of Elba (Vaggi and Biondi, 1999). The Elban phytocenosis, consisting of *Salsolo kali Cakiletum maritimae*, has been floristically impoverished due its scarce extension and antropic disturbance.

12.2.1 . Characteristic species:

*Salsolo kali Cakiletum maritimae*

12.2.2. Important natural processes:

mostly undisturbed

12.2.3. Main human impacts:

tourism

12.2.4. Relevant management practices:

none

## DISTRIBUTION

Local

12.3. Third type of habitat/land cover:

Vegetation of littoral shifting dunes with *Ammophila arenaria*

This type of vegetation exists only on Elba at the Gulf of Lacona (Vagge and Biondi, 1999) in the form of the association *Echinophoro spinosae Elymetum farctii*. It appears locally in two subassociations: *typicum* and *otanthetosum maritimi*. This situation has the potential for a certain development and a good internal articulation, even if the two subassociations are fragmented and floristically impoverished.

- |  |  |
|--|--|
| 12.3.1 . Characteristic species:       | <i>Echinophoro spinosae Elymetum farctii</i> |
| 12.3.2. Important natural processes:   | mostly undisturbed                           |
| 12.3.3. Main human impacts:            | tourism                                      |
| 12.3.4. Relevant management practices: | none   |

## DISTRIBUTION

Local

12.4. Fourth type of habitat/land cover:

Vegetation of fixed dunes with *Crucianella maritima*

This type of dune vegetation has recently been recorded at Lacona (Vaggi and Biondi, 1999) and is very likely not found in other parts of the Tuscan Archipelago. The phytocenosis present at Lacona have been attributed to *Pycnocomon rutifolii Crucianelletum maritimae* due to the dominant presence of *Pycnocomum rutifolium*. The association has been reported along the coasts of the northern Mediterranean (Corsica, the Tuscan Archipelago, Tuscany south of Punta Ala and northern Latium). At Lacona it is found in its best state of conservation.

- |  |                             |
|--|-----------------------------|
| 12.4.1 . Characteristic species:       | <i>Crucianella maritima</i> |
| 12.4.2. Important natural processes:   | mostly undisturbed          |
| 12.4.3. Main human impacts:            | tourism                     |
| 12.4.4. Relevant management practices: | none                        |

## DISTRIBUTION

Local

12.5. Fifth type of habitat/land cover:

Dunes with phytocenosis belonging to the *Malcolmietalia ramosissimae*

At the moment, there are no publications reporting this type of vegetation in Tuscany. However, unpublished observations allow us to report the presence of plant communities containing *Malcolmia ramosissima* in small areas on the backdunes at Lacona.

- |  |                                    |
|--|------------------------------------|
| 12.5.1 . Characteristic species:       | <i>Malcolmietalia ramosissimae</i> |
| 12.5.2. Important natural processes:   | mostly undisturbed                 |
| 12.5.3. Main human impacts:            | tourism                            |
| 12.5.4. Relevant management practices: | none                               |

## DISTRIBUTION

12.6. Sixth type of habitat/land cover:

Local

Dunes with brushwood containing *Juniperus turbinata*

Juniper brushwood is the type of vegetation with the best developed biomass in the dune system. The only habitat where this type of vegetation has been reported is the beach of Lacona (Vagge and Biondi, 1999). The phytocenosis are extremely fragmented and impoverished due to the opening of passages to reach the sea.

- |  |                            |
|--|----------------------------|
| 12.6.1 . Characteristic species:       | <i>Juniperus turbinata</i> |
| 12.6.2. Important natural processes:   | mostly undisturbed         |
| 12.6.3. Main human impacts:            | tourism                    |
| 12.6.4. Relevant management practices: | non                        |

## DISTRIBUTION

12.7. Seventh type of habitat/land cover:

Local

Temporary small Mediterranean pools

This type of habitat contains ephemeral plant communities which take root in small depressions or standing water pools on siliceous sandy subsoil where temporary pools with depths of only a few centimeters form during the rainy season. These are temporary micro habitats, where conditions for the formation of phytocenosis are generally present between February and April after rainfalls. The dominant species are plants of small and very small size which rarely exceed heights of 10 cm. Among these there are some micro pteridophytes (*Isoetes duriei* and *Ophioglossum lusitanicum*), bulbous grasses (*Romulea insularis* on Capraia, *R. columnae* and *R. ramiflora*), annual rushes (*Juncus bufonius*, *J. capitatus* and *J. pygmaeus*), annual grasses (*Lotus angustissimus*, *Cicendia filiformis* and *Laurentia gasparrinii*).

- |  |                       |
|--|-----------------------|
| 12.7.1 . Characteristic species:       | <i>Isoetes duriei</i> |
| 12.7.2. Important natural processes:   | mostly undisturbed    |
| 12.7.3. Main human impacts:            | tourism               |
| 12.7.4. Relevant management practices: | none                  |

## DISTRIBUTION

12.8. Eighth type of habitat/land cover:

Local

Fields of therophytes

The fields of therophytes, or "pseudo-steppes" in accordance with the terminology of Directive 92/43 EEC, are composed of annual herbaceous species, mostly gramineae such as *Vulpia* sp.pl. and *Plantago* sp.pl., which take root in the clearings between the bushes. This, too, is a temporary, winter type of vegetation, which however develops somewhat later than that growing in the temporary pools. The species begin growth at the end of the winter season and bloom from March to May. They can be observed both in the clearings among the maquis and garigues and in abandoned previously cultivated land, mostly former olive groves.

- |  |                    |
|--|--------------------|
| 12.8.1 . Characteristic species:       | <i>Vulpia</i>      |
| 12.8.2. Important natural processes:   | mostly undisturbed |
| 12.8.3. Main human impacts:            | tourism            |
| 12.8.4. Relevant management practices: | none               |



## DISTRIBUTION

12.9. Ninth type of habitat/land cover:

Local

Floating vegetation with species of the genus *Ranunculus*, subgenus *Batrachium*

The only habitat of this kind in the Park is found at the Stagnone on Capraia, the only permanent lake of the Tuscan Archipelago. Around and inside this body of water, there is a mosaic of phytocenosis of small size, belonging to species of various types of growth. Inside the lake, there is both floating and rooting hydrophytic vegetation, dominated by *Ranunculus peltatus* subspecies *baudotii* and *Myriophyllum alterniflorum*. Only one survey found *Potamogeton crispus*.

- |  |                          |
|--|--------------------------|
| 12.9.1 . Characteristic species:       | <i>Ranunculus</i> subgen |
| 12.9.2. Important natural processes:   | mostly undisturbed       |
| 12.9.3. Main human impacts:            | tourism                  |
| 12.9.4. Relevant management practices: | none                     |

## DISTRIBUTION

12.10. Tenth type of habitat/land cover:

Local

Oro-Mediterranean garigues with *Genista desoleana*

This habitat is found only on Elba at altitudes above 600 m on Mount Capanne. This is a discontinuous type of vegetation, dominated by *Genista desoleana*, an endemic species of Sardegna, Corsica, Elba and eastern Liguria, which has recently been described (Valsecchi, 1988). This type of vegetation contains many endemic species: in addition to *Genista*, there are *Viola corsica* subspecies *ilvensis*, *Festuca gamisansii* subspecies *aethaliae*, *Centaurea dissecta* var. *aethaliae*, *Biscutella pichiana* subspecies *ilvensis*.

- |   |                          |
|---|--------------------------|
| 12.10.1 . Characteristic species:       | <i>Genista desoleana</i> |
| 12.10.2. Important natural processes:   | mostly undisturbed       |
| 12.10.3. Main human impacts:            | tourism                  |
| 12.10.4. Relevant management practices: | none                     |

## DISTRIBUTION

12.11. Eleventh type of habitat/land cover:

Local

Coastal undergrowth with *Juniperus turbinata*

Undergrowth and rock growths dominated by *Juniperus turbinata*, found on the upper parts of the cliffs, above vegetation dominated by halophyllous and sub-halophyllous scrubs. They are found on Giannutri (Arrigoni and Di Tommaso, 1981), Pianosa and Elba.

- |   |                            |
|---|----------------------------|
| 12.11.1 . Characteristic species:       | <i>Juniperus turbinata</i> |
| 12.11.2. Important natural processes:   | mostly undisturbed         |
| 12.11.3. Main human impacts:            | none                       |
| 12.11.4. Relevant management practices: | none                       |

## DISTRIBUTION

12.12. Twelfth type of habitat/land cover:

Local

Coastal Euphorbia growths with *Helichrysum* and/or *Thymeleae*

The plant communities with *Helichrysum litoreum* and *Senecio cineraria* form an almost continuous belt around the perimeter of the various islands. This type of vegetation has been reported on Capraia (Foggi and Grigioni, 1999), on Elba (Brullo and De



Marco,1989) and on Giannutri (Arrigoni and Di Tommaso, 1981), but according to unpublished observations is also present on Pianosa, where it has been found in inland locations; it is most likely also present on other islands.

- |   |                             |
|---|-----------------------------|
| 12.12.1 . Characteristic species:       | <i>Helichrysum litoreum</i> |
| 12.12.2. Important natural processes:   | mostly undisturbed          |
| 12.12.3. Main human impacts:            | tourism                     |
| 12.12.4. Relevant management practices: | none                        |

#### DISTRIBUTION

12.13. Thirteenth type of habitat/land cover:

Local

##### Thermo-Mediterranean Euphorbia with *E.dendroides*

This is the most thermophilous vegetation present in the Tuscan Archipelago. It is found along the rocky coasts of most of the islands (Capraia, Montecristo, Elba and Giannutri, some islets), but it tends to form plant communities of a noticeable size only on Capraia (Foggi and Grigioni,1999) and Giannutri (Arrigoni and Di Tommaso,1981).

- |   |                     |
|---|---------------------|
| 12.13.1 . Characteristic species:       | <i>E.dendroides</i> |
| 12.13.2. Important natural processes:   | mostly undisturbed  |
| 12.13.3. Main human impacts:            | tourism             |
| 12.13.4. Relevant management practices: | none                |

#### DISTRIBUTION

12.14. Fourteenth type of habitat/land cover:

Local

##### Ampelodesmos grasses

This habitat is found covering ample surfaces only on Elba; there are sporadic occurrences on Giglio. The ampelodesmos grasses are particularly developed in the area between Rio Marina and Rio nell'Elba, on the eastern part of the island. They are mostly located on abandoned terraces where vines had previously been planted. They are subject to frequent fires which permit the conservation of the habitat.

- |   |                       |
|---|-----------------------|
| 12.14.1 . Characteristic species:       | <i>Vitis vinifera</i> |
| 12.14.2. Important natural processes:   | mostly undisturbed    |
| 12.14.3. Main human impacts:            | agriculture           |
| 12.14.4. Relevant management practices: | none                  |

#### DISTRIBUTION

12.15. Fifteenth type of habitat/land cover:

Local

##### Chasmophytic vegetation on siliceous cliffs

This habitat has been found on Capraia (Foggi and Grigioni,1999) and on Montecristo (Filipello and Sartori,1981). There are unpublished observation for the Volterraio region of Elba. The habitat may be divided into two main types of cliffs: xeric cliffs and hydrophilous / skiophylous cliffs.

- |   |                    |
|---|--------------------|
| 12.15.1 . Characteristic species:       |                    |
| 12.15.2. Important natural processes:   | mostly undisturbed |
| 12.15.3. Main human impacts:            | none               |
| 12.15.4. Relevant management practices: | none               |

## DISTRIBUTION

12.16. Sixteenth type of habitat/land cover:

Local

Streambed brush dominated by oleander

These are found only on Capraia at the Vado del Porto and the Vado dell'Anghiale, where their development has a certain significance. This is the only location in Tuscany where there is a natural occurrence of this maquis, which is characteristic for the torrential streams in the warmer areas of the Mediterranean basin. The dominant layer of this linear plant community is made up only of *Nerium oleander*, the bush layers below are formed by evergreen woodland species (*Quercetum ilicis*).

12.16.1. Characteristic species:

*Nerium oleanderi*

12.16.2. Important natural processes:

mostly undisturbed

12.16.3. Main human impacts:

tourism

12.16.4. Relevant management practices:

none

## DISTRIBUTION

12.17. Seventeenth type of habitat/land cover:

Local

Chestnut forests

The chestnut tree was introduced to the Archipelago in antiquity (Gatteschi and Arretini, 1989). Currently, there is a single tree on Capraia, some small localized populations on Giglio and Gorgona, and on Elba, where there is a discrete coverage in the north-eastern part of the island, on the cooler slopes of Mount Capanne. There the chestnut tree has become naturalized for centuries and forms an important element of the vegetation landscape. It is probable that the chestnut trees were planted in place of the original mesophile mountain ilex *Asplenio Quercetum ilicis*.

12.17.1. Characteristic species:

*Castanea sativa*

12.17.2. Important natural processes:

mostly undisturbed

12.17.3. Main human impacts:

agriculture and forestry

12.17.4. Relevant management practices:

none

## DISTRIBUTION

12.18. Eighteenth type of habitat/land cover:

Local

Cork oak forests

The cork oak (*Quercus suber*) is found on Elba, Giglio, Gorgona and Capraia. According to Gatteschi and Arretini (1989), the species is indigenous only to Elba, where it is often found in valleys with a NE exposure in the central and eastern part of the island. Here the cork oak is found as the dominant tree in brushes of *Erico Arbutetum quercetosum suberis* or else together with ilex of the association *Viburno Quercetum ilicis*.

12.18.1. Characteristic species:

*Quercus suber*

12.18.2. Important natural processes:

mostly undisturbed

12.18.3. Main human impacts:

tourism

12.18.4. Relevant management practices:

none

## DISTRIBUTION

12.19. Nineteenth type of habitat/land cover:

Local

Mesophile forest dominated by ilex and black hornbeam

This habitat is found only on Elba on the northern slopes of Mount Capanne at altitudes between 500 and 700 m. This is a very interesting habitat, because it represents the tree vegetation of the Mediterranean mountains. It is characterized by the presence of mesophile and acidophilous species, many of which are also found in chestnut forests. Species such as *Ilex aquifolium* and *Taxus baccata* are present in some small areas.

12.19.1 . Characteristic species: *Ilex aquifolium* and *Taxus baccata*.

12.19.2. Important natural processes: mostly undisturbed

12.19.3. Main human impacts: tourism

12.19.4. Relevant management practices: none

## DISTRIBUTION

12.20. Twentieth type of habitat/land cover:

Local

Forests and plantations of Mediterranean pine trees (*P.pinaster*, *P.pinea*, *P.halepensis*) within their natural distribution zone

Currently, there are Mediterranean pines on Elba, Capraia, Giglio, Gorgona, Pianosa. *Pinus halepensis* and *P.pinea* are found on Montecristo, while on Giannutri we find only *P.halepensis*. It is probable that none of the three species has arrived spontaneously in the Archipelago. Their current distribution is due to reforestation programs of the 20<sup>th</sup> century, most of which took place between the 50s and 70s.

12.20.1 . Characteristic species: *P.pinaster*, *P.pinea*, *P.halepensis*

12.20.2. Important natural processes: mostly undisturbed

12.20.3. Main human impacts: tourism

12.20.4. Relevant management practices: none

## MARINE ECOSYSTEMS AND HABITATS

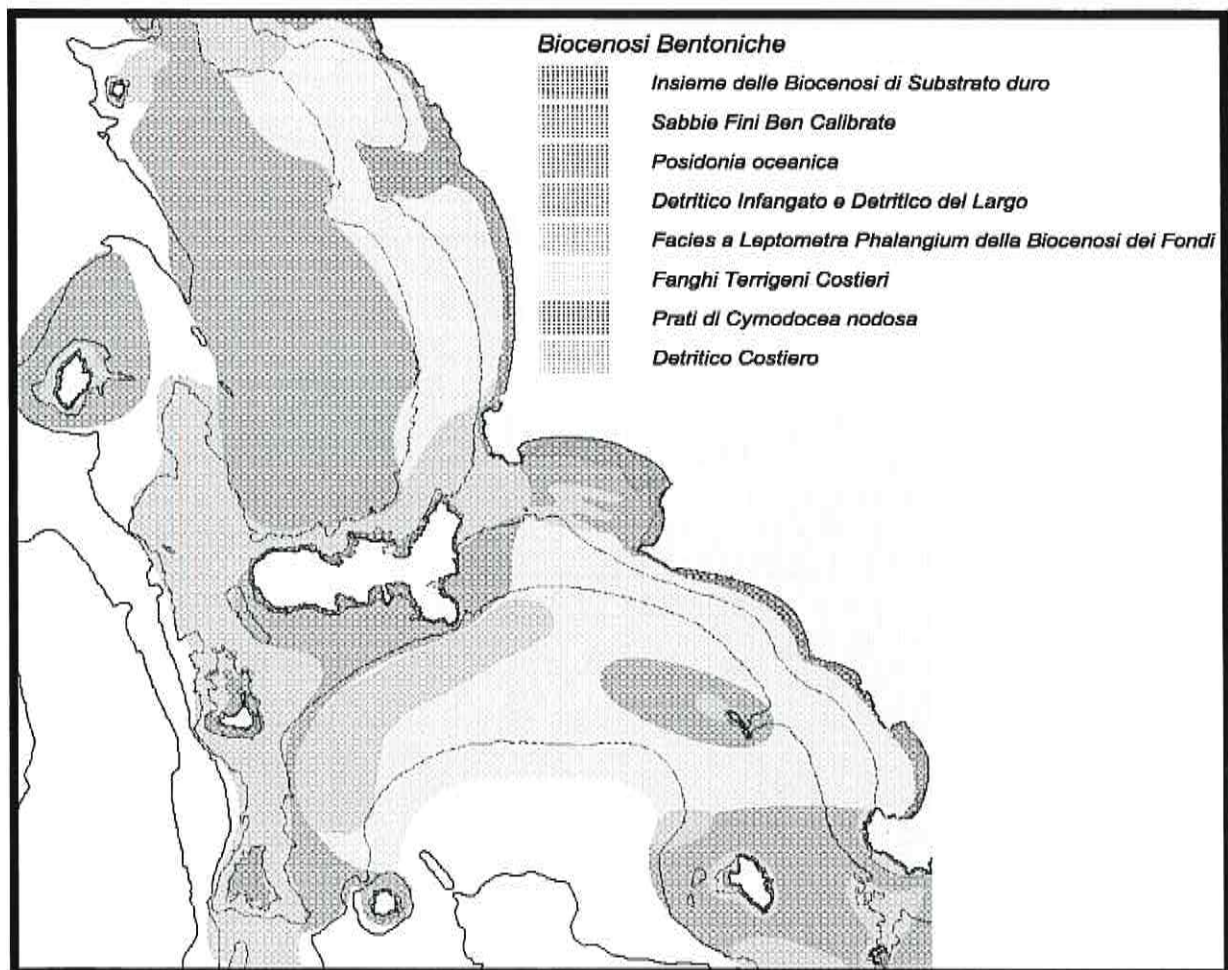
### Marine ecosystems

The shifting sea beds surrounding the Archipelago's islands consist for the most part of detritus (biocenosis of coastal detritus, biocenosis of open sea detritus, biocenosis of muddy detritus). Sediments to the east, south and west of Elba show biocenosis of open sea detritus already at a depth of less than 50. The biocenosis of "fine sand" can also be found. It is typically located in shallow marine areas and is often found between the coast and the upper limit of phanerogam beds. The dominant elements are the algae *Lithothamnion* spp. and *Peyssonnelia* spp., the crustaceans *Macropodia rostrata* and *Galathea intermedia*, the polychaetes *Hyalinoecia tubicola* and *Glycera tessellata*, the mollusk *Laevicardium oblungum*, the echinoderms *Ophiura albida* and *Genocypris maculata*. More towards the open sea, there are populations characterized by the presence of the brachiopod *Gryphus vitreus* along the western side of Gorgona, between Pianosa and the Formiche di Montecristo and on the southern side of Montecristo. Another biocenosis typical of shifting *L. phalangium* sea beds is found at deeper levels. This has a well defined spatial distribution and is found only in two areas, the first one between Elba and Montecristo, the second one around Giglio. Situations similar to those found in the Tuscan Archipelago with respect to the variety of benthic



species and biocenoses as well as to their state of conservation can now rarely be found along the continental coast of the central and northern Tyrrhennian. The biological characteristics of the sea bed around the islands north of Elba are those typical for intact Mediterranean environments and may be compared to those of some other small islands or of the coast of the basin bordered by Corsica, Provence and Liguria. Intact environments unaltered by humans, such as those of Gorgona, Montecristo, Pianosa and Giannutri, can elsewhere be found only in some protected areas of France (Port Cros, Scardola) and Spain (Medas islands). The absence or limitation of fishing or catching of marine animals of any kind has made it possible to maintain a rich and diversified population of benthic species and fish (e.g. various types of lobster). Some rare species, which have already disappeared from many areas of the Mediterranean, can be found on the sea bed around the islands (red coral *Corallium rubrum*). Concerning vegetation, we note the presence of the algae *Liagora distenta* (at Capraia, only occurrence in Tuscany), *Laminariales Phyllariopsis brevipes*, the appearance of a species new to Tuscany at Gorgona, the brown alga *Hydroclathrus clathrus*, found in the warmer areas of the Mediterranean, at Giglio the presence of the red alga *Polysiphonia bifornis*, sporadically reported in the Mediterranean, and at Giannutri the *Sargassum acinarium*.

### **BENTHIC BIOCENOTIC OF THE TIBR**





### Marine habitats

Analysis of data available in scientific literature shows that the benthic populations around the Archipelago's islands show an elevated heterogeneousness. This is due both to "natural" factors, such as the particular geo-morphological conformation of the coasts and the seabed and the good quality of the water, and to the level of protection that many of the islands have had and continue to have. Indeed, there are biocenoses of shifting and hard seabeds both near the coast and in the open sea, which are typical for the oligotrophic waters of the Mediterranean and are found here in their most intact form. The hard seabed near the coasts show biocenoses typical for vertical walls with progression from the surface to the seabed, tidal zones that are often bordered by a ridge of encrusting algae, areas of photophile algae, and areas with skiophilous populations and often with coralligenous. The shifting coastal seabeds show the classic progression of sand - coastal detritus - mud together with their respective biocenoses. In the open sea, we find the biocenoses typical for shifting seabeds. Outstanding among them is a particular facies of open sea detritus, which is characterized by the dominance of the crinoid *Leptometra phalangium*. There is a large number of rare, protected or threatened species present in these seabeds.

## **FAUNISTIC ASPECTS**

### Invertebrates

The following taxa are present in the TIBR:

- *Insecta Plecoptera* lotic and lentic aquatic and terrestrial habitats;
- *Insecta Coleoptera* (*Carabidae*, *Idroadepphaa*, *Hydraenidae*, *Nitiduloidea*, *Tenebrionidae*, *Chrysomelidae Alticinae*) freshwater and terrestrial habitats;
- *Insecta Hymenoptera Formicidae* terrestrial habitats;
- *Insecta Lepidoptera (Ropaloceri)* terrestrial habitats;
- *Chilopoda* terrestrial habitats;
- *Crustacea Isopoda e Amphipoda* freshwater and terrestrial habitats.

The study of the representatives of the above taxonomic groups has the potential to provide information of considerable precision about the qualitative state of the principal terrestrial and freshwater ecosystems of the area under study.

### Herpetofauna

The insular character of the Tuscan Archipelago National Park has substantial consequences for the herpetological fauna. The low dispersive capacity of reptiles and amphibians and their extreme adaptability (especially in reptiles) has given rise to phenomena of extreme intraspecies variability. Moreover, the capacity to use even environments with low productivity has allowed them to colonize very small islets on which sauri are often the only vertebrate species present.

### Avifauna

From an ornithological point of view, the TIBR comprises a territory characterized by islands on which there are various species with particular conservational significance both on a local and national level. Both nesting and wintering birds included in Appendix I of EEC Directive 79/409 are present on the territory. Overall, 67 species of nesting birds have been identified with certainty on the TIBR's islands (Tellini Florenzano et

al.(eds.)1997). These represent 40.6% of birds nesting regularly in Tuscany. A total of 75 wintering species have been identified, which represent 43% of species regularly wintering in Tuscany. The overall number of both nesting and wintering bird species in the Tuscan Archipelago is 103.

#### Mammals

Among the species present in the Archipelago, those have been selected which present a "faunistic emergency" and thus merit in-depth study in accordance with the Habitat Directive 92/43/CEE, the D.P.R. 357/97, the Red List of the IUCN 1996 and the national level Red Lists (Calvario and Sarrocco,1997; Pinchera et al.,1997).

### 13. CONSERVATION FUNCTION

#### 13.1. Contribution to the conservation of landscape and ecosystem biodiversity

[Describe and give location of landscapes, ecosystems, habitats and/or land cover types of particular significance for the conservation of biological diversity.]

The TIBR offers extraordinary opportunities for the conservation and protection of precious Mediterranean terrestrial and marine ecosystems at the interface between man and the biosphere. A few instances of significant need for conservation measures are highlighted in the following sections: Terrestrial ecosystems and Marine ecosystems.

#### TERRESTRIAL ECOSYSTEMS

The areas of increased phyto-geographic importance, to whose conservation particular attention must be paid, can be identified on the basis of the incidence of endemic and rare species, the presence of rare habitats and of rare vegetation. Below is a description of the more important areas of the various islands and the conservation issues connected to them.

##### Elba

The island has two great cores of seminatural spontaneous vegetation. The first one is in the western part and culminates in Mount Capanne, site of rare and endemic species and original vegetation types. Mount Capanne's naturalistic value is remarkable for the concentration of endemic species of the Archipelago and the Sardo-Corsican environment and for habitats of conservational interest. Of importance are also certain combinations of flora that must be considered unique. The eastern core area of Elba shows a rather degraded vegetation but nevertheless contains several rare and endemic species of considerable importance.

##### Capraia

The areas with the greatest botanical interest (Foggi, Grigioni, Luzzi, 2001) are the rocky costs of the western side, the coastal areas of the promontories, Lake Stagnone, the oleander brush in the lower parts of Vado del Porto and Vado dell'Anghiale. It would be important to foster the growth of brush on the steeper slopes in order to increase the biomass and consequently reduce erosion.

##### Gorgona

The vegetation of the steep coastal margins is of great interest since it preserves important coastal species.

##### Pianosa

Of particular interest are the coastal strip and some stretches of forest vegetation (Punta del Marchese and Porto Romano, Lavanderia Vecchia Golfo della Botte, the surroundings of the village Cala San Giovanni and Cala Giovanna), which combine naturalistic aspects with archaeological and historical features. Particular attention must be paid to the remnants of coastal vegetation, most importantly the *Juniperus turbinata* Guss. brush and to the islet of Scola.

### Montecristo

The island remains frozen in a condition of a degraded ecosystem due to the anomalous presence of goats. The possibility of a certain reconstructive dynamism regarding the cores of forest vegetation is directly linked to the removal of these animals.

### Giglio

The limestone promontory del Franco presents small areas in which some very rare species can be found, such as *Fumana scoparia* Pomel (Cala dell'Allume) and *Brassica incana* Ten. (Campese Cala dell'Allume). Of particular interest are the few remaining forest areas and the brush of the island's siliceous central part.

### Giannutri

The central and western parts of the island present habitats of considerable interest and important species of vegetation. The species which warrant particular attention are *Cneorum tricoccon* L., currently well represented in the maquis all over the island, *Juniperus turbinata* Guss. and *Euphorbia dendroides* L., in the coastal areas. It would be advisable to actively reconstruct the Mediterranean thermophilous brush. Most vegetational features of the island warrant conservation, in particular the coastal belt of *Helichrysum litoreum*, the junipers and the Euphorbia brush.

## **13.2 Conservation of species biodiversity**

[Identify main species (with scientific names) or groups of species of particular interest for the conservation of biological diversity, in particular if they are rare or threatened with extinction; use additional sheets if need be.]

### TERRESTRIAL FLORA

The level of knowledge of the flora is not homogenous for all the islands. Nevertheless, for comparative purposes the floristic diversity of the islands, in terms of the number of vascular plants, can be summarized as follows on the basis of current knowledge:

- Gorgona	541
- Capraia	712
- Elba	1209
- Pianosa	545
- Cerboli	72
- Palmaiola	122
- Giglio	734
- Giannutri	364
- Formiche	35
- Montecristo	478



### Endemic plants

The species exclusive (endemic) to the Archipelago and to the individual islands are as follows:

<b>Species</b>	<b>Location</b>
<i>Arenaria balearica</i> L.	Montecristo
<i>Arum pictum</i> L.fil.	Montecristo
<i>Biscutella pichiana</i> ssp. <i>ilvensis</i> Raffaelli	Elba
<i>Borago pygmaea</i> Chater	Capraia
<i>Carex microcarpa</i> Bertol.	Capraia, Elba, Giglio
<i>Carduus fasciculiflorus</i> Viv.	Montecristo
<i>Centaurea aplolepa</i> Moretti subsp. <i>aetaliae</i>	Elba
<i>Centaurea dissecta</i> Ten.var. <i>ilvensis</i> Sommier	Elba
<i>Centaurea gymnocarpa</i> Moris et De Notaris	Capraia
<i>Cymbalaria aequitriloba</i> A.Chevalier	Gorgona, Capraia, Elba, Giglio
<i>Crocus etruscus</i> Parl.	Elba
<i>Crocus minimus</i> DC.	Capraia
<i>Festuca arundinacea</i> Schreber ssp. <i>corsica</i>	Capraia, Gorgona
<i>Festuca gamisansii</i> Kerguelen ssp. <i>aethaliae</i>	Elba
<i>Gagea granatellii</i> var. <i>obtusiflora</i> Sommier	Giglio
<i>Galium caprarium</i> Natali	Gorgona, Capraia
<i>Helichrysum litoreum</i> Guss.	Capraia, Elba, Giglio, Pianosa
<i>Hypericum hircinum</i> L.	Elba, Montecristo
<i>Linaria capraria</i> Moris	on all islands
<i>Limonium doriae</i> Somm.	Formica grande di Grosseto
<i>Limonium ilvae</i> Pign.	Elba
<i>Limonium planesiae</i> Pign.	Pianosa
<i>Limonium sommierianum</i> Arrig.	Giannutri, Giglio, Montecristo
<i>Limonium contorti rameum</i> Erben	Capraia
<i>Mentha requienii</i> Benthham ssp. <i>bistaminata</i>	Capraia, Montecristo
<i>Mentha suaveolens</i> Ehrh.ssp. <i>insularis</i>	Capraia
<i>Ophrys tyrrhena</i> Götz et Reinh.	Elba
<i>Ophrys crabronifera</i> Mauri	Giglio, Pianosa
<i>Pancratium illyricum</i> L.	Capraia, Elba
<i>Ptilostemon casabonae</i> (L.)	Elba
<i>Romulea insularis</i> Sommier	Capraia, Elba
<i>Saxifraga ranulata</i> L. var. <i>brevicaulis</i>	Capraia
<i>Scrophularia trifoliata</i> L.	Gorgona, Montecristo
<i>Silene capraria</i> Somm.	Capraia
<i>Silene badaroi</i> Breistr.	Gorgona, Capraia, Elba
<i>Soleirolia soleirolii</i> Req.	Capraia
<i>Stachys corsica</i> Pers.	Capraia
<i>Stachys lutosus</i> L.	Capraia
<i>Trisetaria burnouffii</i> Req.	Capraia
<i>Urtica atrovirens</i> Req.	Gorgona, Capraia, Elba, Giglio, Pianosa
<i>Verbascum conocarpum</i> Moris	Montecristo
<i>Viola corsica</i> Nyman subsp. <i>ilvensis</i> Merxm.	Elba

### Protected species

This group contains only those species of the Archipelago that are cited in Regional Law 56/2000 entitled "Regulations for the conservation and protection of natural and seminatural habitats and of wild flora and fauna". The law identifies species that may be gathered only in limited numbers or not at all:

*Agrostemma itha*  
*Centaurea sp.pl.*  
*Orchidaceae*  
*Chamaerops humilis*  
*Osmunda regalis*  
*Consolida regalis*  
*Pancratium maritimum*  
*Delphinium sp.pl.*  
*Saxifraga sp.pl.*  
*Dianthus siculus*  
*Tulipa sp.pl.*  
*Dianthus tripunctatus*  
*Viola corsica subsp.ilvensis*  
*Gladiolus palustris*  
*Asparagus acutifolius*  
*Narcissus sp.pl.*  
*Dianthus sp.pl.*  
*Ruscus aculeatus*  
*Ilex aquifolium*

### Rare species

There are various categories of rare species among the flora of the Archipelago:

#### Rare Endemic species:

<i>Biscutella pichiana</i> Raffaelli ssp. <i>ilvensis</i> Raffaelli	Elba
<i>Centaurea aplolepa</i> Moretti subsp. <i>aetaliae</i> (Sommier)Dostal	Elba
<i>Centaurea dissecta</i> Ten.var. <i>ilvensis</i> Sommier	Elba
<i>Centaurea gymnocarpa</i> Moris et De Not.	Capraia
<i>Mentha requienii</i> Benthham ssp. <i>bistaminata</i>	Capraia, Montecristo
<i>Silene capraria</i> Sommier	Capraia

#### Rare on Tuscan territory:

<i>Alkanna lutea</i> DC.	Montecristo
<i>Allium amethystinum</i> Tausch	Gorgona
<i>Arenaria balearica</i> L.	Montecristo
<i>Aristolochia rotunda</i> L.ssp. <i>insularis</i>	Capraia
<i>Arum pictum</i> L.	Montecristo
<i>Asplenium balearicum</i> Shivas	Capraia
<i>Asplenium marinum</i> L.	Capraia
<i>Biscutella maritima</i> Ten.	Gorgona

<i>Borago pygmaea</i> Chater et W. Greuter	Capraia
<i>Brassica fruticulosa</i> Cyr.	Elba
<i>Brassica procumbens</i> O. E. Schultz	Giglio
<i>Bromus fasciculatus</i> Presl	
<i>Bromus lanceolatus</i> Roth	
<i>Bromus tectorum</i> L.	
<i>Carduus fasciculiflorus</i> Viv.	Montecristo
<i>Carex microcarpa</i> Bertol.	Capraia, Elba, Giglio
<i>Centaureum erythraea</i> Rafn subsp. <i>majus</i>	Giannutri
<i>Cneorum tricocon</i> L.	Giannutri, Montecristo
<i>Convolvulus tricolor</i> L.	Giannutri
<i>Corrigiola telephiifolia</i> Pourret	Giglio
<i>Crassula vaillantii</i> Roth	
<i>Crocus etruscus</i> Parl.	Elba
<i>Crocus minimus</i> DC.	Capraia
<i>Dianthus sicalus</i> Presl	Capraia
<i>Dianthus tripunctatus</i> Sibth. et Sm.	Elba
<i>Dryopteris oreades</i> Fomin	Elba
<i>Dryopteris tyrrhena</i> Fras. Jenk. et Reichst.	Capraia
<i>Epipactis helleborine</i> L.	Elba
<i>Erodium chium</i> (L.) Willd.	
<i>Erodium lebelii</i> Jordan ssp. <i>maruccii</i> (Parl.)	Elba
<i>Euphorbia pithyusa</i> L.	
<i>Festuca arundinacea</i> Schreber ssp. <i>corsica</i> Kerguelén	Capraia
<i>Festuca gamisansii</i> Kerguelén ssp. <i>aethaliae</i>	Elba
<i>Fumana scoparia</i> Pomel	Giglio
<i>Gagea cfr. busambarensis</i> (Tineo) Parl.	Elba
<i>Gagea granatellii</i> (Parl.) Parl. var. <i>obtusiflora</i> Sommier	Elba.
<i>Galium caprarium</i> Natali	Gorgona, Capraia
<i>Galium minutulum</i> Jordan	Capraia, Giannutri
<i>Genista desoleana</i> Valsecchi	Elba
<i>Gladiolus inarimensis</i> Guss.	Pianosa
<i>Glyceria spicata</i> (Biv.) Guss.	Elba.
<i>Gynandris sisyrinchium</i> (L.) Parl.	
<i>Hieracium cinerascens</i> Jord.	Elba.
<i>Holcus setiglumis</i> Boiss. et Reuter subsp. <i>duriensis</i> P. Silva	Capraia
<i>Hymenolobus procumbens</i> (L.) Nutt ex Torrey et Gray	
<i>Hyoseris scabra</i> L.	Pianosa.
<i>Hypocoum procumbens</i> L.	Pianosa.
<i>Hypericum hircinum</i> L.	Elba, Montecristo
<i>Lamarckia aurea</i> (L.) Moench	
<i>Lavatera maritima</i> Gouan	Gorgona
<i>Limonium contortirameum</i> (Mabille) Erben	
<i>Limonium doriae</i> (Somm.) Pignatti	
<i>Limonium gorgonae</i> Pignatti	Gorgona
<i>Limonium ilvae</i> Pignatti	Elba



<i>Limonium planesiae</i> Pignatti Pianosa, is. Scola.	
<i>Limonium sommierianum</i> (Fiori) Arrigoni	Giannutri, Montecristo
<i>Linaria capraria</i> Moris et De Notaris	
<i>Linaria repens</i> (L.) Miller	Montecristo
<i>Linaria triphylla</i> (L.) Miller	Gorgona, Elba, Pianosa
<i>Lotus coniugatus</i> L. subsp. <i>requienii</i> Greuter	Gorgona
<i>Lotus tetragonolobus</i> L.	
<i>Matthiola tricuspidata</i> (L.) R. Br.	Elba, Pianosa
<i>Medicago ciliaris</i> (L.) All.	
<i>Medicago rugosa</i> Desr.	
<i>Medicago soleirolii</i> Duby	Elba
<i>Mentha suaveolens</i> Ehrh. ssp. <i>insularis</i> (Req.) Greuter	Capraia
<i>Mesembryanthemum crystallinum</i> L.	
<i>Myriophyllum alterniflorum</i> DC.	Capraia
<i>Narcissus tazetta</i> L. subsp. <i>aureus</i> (Loisel.) Baker	Elba
<i>Narcissus tazetta</i> ssp. <i>italicus</i> (Ker Gawler) Baker	Elba
<i>Nerium oleander</i> L.	Capraia
<i>Onopordum illyricum</i> L. ssp. <i>horridum</i> (Viv.) Franco	Pianosa
<i>Orobanche fuliginosa</i> Reuter ex Jordan	Capraia, Elba
<i>Pancratium illyricum</i> L.	Capraia, Elba
<i>Panicum repens</i> L.	
<i>Papaver pinnatifidum</i> Moris	
<i>Phalaris elongata</i> Br. Bl.	Elba
<i>Phyllitis sagittata</i> (DC.) Guinea Heywood	Pianosa
<i>Plantago cornuti</i> Gouan	Montecristo
<i>Plantago macrorhiza</i> Poiret	
<i>Plantago weldenii</i> Reichenb.	
<i>Ptilostemon casabonae</i> (L.) W. Greuter	Elba
<i>Ranunculus bullatus</i> L.	Pianosa
<i>Ranunculus peltatus</i> Schrank ssp. <i>baudotii</i>	Capraia
<i>Ranunculus trilobus</i> Desf.	
<i>Ridolfia segetum</i> Moris	Montecristo
<i>Romulea insularis</i> Somm.	Capraia, Elba
<i>Salicornia emerici</i> Duval Jouve	Elba
<i>Salicornia patula</i> Duval Jouve	Elba
<i>Sarcocornia fruticosa</i> (L.) A. J. Scott	Elba
<i>Sarcocornia perennis</i> (Miller) A. J. Scott	Elba
<i>Saxifraga ranulata</i> L. var. <i>brevicaulis</i> Sommer	Capraia
<i>Scrophularia trifoliata</i> L.	Gorgona, Montecristo
<i>Sedum andegavense</i> (DC.) Desv.	
<i>Sedum hirsutum</i> All.	
<i>Silene badaroi</i> Breistr.	Gorgona, Capraia, Elba
<i>Silene laeta</i> (Ait.) Godr.	
<i>Silene nicaeensis</i> All.	Elba
<i>Soleirolia soleirolii</i> (Req.) Dandy	Capraia
<i>Stachys corsica</i> Pers.	Capraia

<i>Stachys lutinosa</i> L.	Capraia
<i>Stachys maritima</i> Gouan	Elba
<i>Stachys marrubifolia</i> Viv.	Elba
<i>Taraxacum gasparrinii</i> Tineo	Elba
<i>Thapsia garganica</i> L.	
<i>Thesium humile</i> Vahl	
<i>Triglochin laxiflorum</i> Guss.	
<i>Trisetaria burnoufii</i> Banfi et Soldano	Capraia
<i>Verbascum conocarpum</i> Moris	Montecristo
<i>Viola corsica</i> Nyman subsp. <i>ilvensis</i> (W.Becker) Merxm.	Elba
<i>Vulpia muralis</i> Nees	

### TERRESTRIAL FAUNA

The following is a complete list of all species and subspecies of amphibians and reptiles present on the islands and islets of the TIBR:

#### Herpetofauna

Protected rare or threatened species

None of these species is endemic to the Archipelago. However, all the subspecies or presumed subspecies of the species listed below are endemic or almost-endemic (where they are also found on some islets outside the Parks' boundaries):

<i>Podarcis siculus</i>	except the <i>P.s.campestris</i> of Elba
<i>Podarcis muralis</i>	often exclusive to a single island
<i>Discoglossus sardus</i>	species found in the Tyrrhenian
<i>Bufo Bufo spinosus</i>	
<i>Bufo viridis viridis</i>	emerald toad, found in Europe and Central Asia
<i>Hyla sarga</i>	Tyrrhenian tree frog. Capraia, Elba
<i>Rana bergeri</i>	Berger frog
<i>Rana klepton hispanica</i>	Uzzel frog
<i>Testudo hermanni hermanni</i>	Hermann's tortoise
<i>Tarentola mauritanica</i>	Common gecko
<i>Hemidactylus turcicus</i>	Mediterranean gecko
<i>Euleptes europaea</i>	Small gecko, species distributed in the Tyrrhenian.
Among the vertebrate, the <i>Euleptes europaea</i> , found on all the islands and islets of the Tuscan Archipelago, is one of the most interesting species from a bio-geographical point of view. Its distribution is extremely fragmented. It is found on many islands and islets in Provence, Liguria, Corsica, Sardegna and in northern Tunisia, while there are only a few populations on the mainland (France, Liguria, Tuscany).	
<i>Podarcis muralis</i>	Wall lizard. The populations most at risk of extinction are those living on the very small islets. A limited case is represented by a population of <i>P. m. colosii</i> living on the islet Scoglio della Paolina a short distance from Elba. This islet has a surface area of 4700 m <sup>2</sup> and a maximum altitude of 13 meters.
<i>Podarcis siculus</i>	Field lizard, species distributed on the Appenine
<i>Lacerta bilineata</i>	Western green lizard, distributed on the Appenine
<i>Chalcides chalcides chalcides</i>	Three-toed skink, species distributed on the Appenine

*Hieropsis viridiflavus viridiflavus* European whip snake, species distributed in Europe  
*Coronella austriaca* Smooth snake, species distributed in Europe  
*Natrix natrix helvetica* Ringed snake  
*Vipera aspis* Common viper, species distributed in Europe. A phenotype of the *hugyi* type on Montecristo has been attributed to a passive transport that took place in historical times.

#### Avifauna

Rare or threatened protected species

Audouin's gull	Capraia, Giglio, Pianosa
Cory's shearwater	Giannutri, Pianosa
Red-legged partridge	Capraia (introduced), Elba, Pianosa (introduced)
Dartford warbler	Capraia, Elba, Giannutri, Montecristo, Pianosa
Shag	Capraia, Elba, Giannutri, Gorgona, Pianosa
Peregrine falcon	Capraia, Elba, Giglio, Gorgona, Montecristo, Pianosa
Manx shearwater	Giannutri, Montecristo
Rock thrush	Elba

#### Mammals

Species or subspecies included in Annex II of EEC Directive 92/43 and Annex B of the D.P.R. 357/97

*Rhinolophus euryale*  
*Rhinolophus ferrumequinum*  
*Rhinolophus hipposideros*  
*Barbastella barbastellus*  
*Miniopterus schreibersi*  
*Myotis blythi*  
*Myotis myotis*

### MARINE FLORA AND FAUNA

#### Protected or threatened species

##### Porifers

The sponge *Axinella polypoides*, species included in the list of endangered or threatened marine species, Annex II of the ASPIM Protocol (Gorgona, Giglio).

The sponge *Spongia officinalis*, species included in Annex III of the Bern Convention (Giannutri).

##### Cnidaria

Red coral (*Corallium rubrum*), species included in Annex III of the Bern Convention (Pianosa, Elba, Giannutri).

Black coral (*Gerardia savaglia*), species included in Annex II of the Bern Convention and in the list of endangered or threatened marine species, Annex II of the ASPIM Protocol (Giannutri).



### Echinoderms

Sea urchin *Paracentrotus lividus*, species included in Annex III of the Bern Convention (Pianosa, Capraia).

Long-spined sea urchin *Centrostephanus longispinus*, species included in Annex II of the Bern Convention and in the list of endangered or threatened marine species, Annex II of the ASPIM Protocol (Giannutri).

### Crustaceans

Spider crab (*Maja squinado*), species included in Annex III of the Bern Convention (Pianosa, Gorgona, Giannutri).

Red lobster (*Palinurus elephas*), species included in Annex III of the Bern Convention (Pianosa, Gorgona, Giglio).

European lobster (*Homarus gammarus*), species included in Annex III of the Bern Convention (Gorgona, Capraia).

Mediterranean slipper lobster (*Scyllarides latus*), species included in Annex III of the Bern Convention (Gorgona).

Slipper lobster (*Scyllarus arctos*), species included in Annex III of the Bern Convention (Gorgona).

### Mollusks

Ribbed Mediterranean limpet (*Patella ferruginea*), species included in Annex II of the Bern Convention and in the list of endangered or threatened marine species, Annex II of the ASPIM Protocol (Pianosa, Giannutri, Capraia, Montecristo).

Fan shell (*Pinna nobilis*), species included in the list of endangered or threatened marine species, Annex II of the ASPIM Protocol (Pianosa, Giannutri, Gorgona, Elba, Giglio).

Cyprea *Cyprea (Lurida) luriga*, species included in the list of endangered or threatened marine species, Annex II of the ASPIM Protocol (Capraia).

The presence of the following habitats, found among the habitats listed in Annex I of EEC Directive 92/43, is highlighted:

*Posidonia* beds (around all islands).

Submerged or partially submerged sea caves (in particular at Pianosa and Giannutri).

We can find the following species from the list of rigorously protected Mediterranean marine flora (Annex I of the Bern Convention) at various islands:

### Algae

*Cystoseira amentacea* (including *var. stricta*)

*Cystoseira mediterranea*

*Cystoseira spinosa*

*Goniolithon byssoiges*

*Lithophyllum lichenoides*

*Cymodocea nodosa*

*Posidonia oceanica*

#### Rare species

*Jujubinus baudoni* (mollusk) Capraia, Montecristo

*Astrospartus mediterraneus* (gorgonocephalus, echinoderm) Giglio

*Aphanius fasciatus*, (teleost), single case on the small islands, at Elba

*Desdemona ornata* (polychaet), first reported sighting in the northern hemisphere, at Elba

*Phyllariopsis brevipes*, (alga of the order Laminariales), in the shallows of Cala Scirocco at Gorgona

#### 13.3. Conservation of genetic biodiversity:

[Indicate species or varieties of traditional or economic importance and their uses, e.g. for medicine, food production, etc.]

The protection and appreciation of the animal and vegetational germ plasm of Tuscany represents one of the most important tasks the Region of Tuscany has taken on with its Regional Law 50 of July 16, 1997 regarding the "Protection of autochthonous genetic resources". The research and recuperation activities regarding old cultivars or breeds of agricultural interest become thus fundamental for the preservation of a local genetic heritage at risk of disappearance. The increased environmental value represented by the cultivars, the populations, the breeds, the ecotypes, etc., which are at risk of genetic erosion, confirm the importance of protecting the local germ plasm. Moreover, this genetic heritage is very much linked to the territory's agricultural traditions and to the typical products of the region's various areas. To protect and recuperate the local germ plasm also means to protect and appreciate the environment, the territory and the rural culture. Law 50/97 "protects" the animal and vegetation resources of Tuscany with a mechanism that may be started by scientific bodies or institutions, by individual citizens and by public and/or private organizations. Such a request, together with all the specific documentation, undergoes an investigation by the competent Techno-scientific Commission entrusted with this task by the Regional Council. Following a positive decision by the Commission, the conservation and protection process for the animal or plant species in question is initiated. According to Law 50/97, even breeds, species, varieties and cultivars of outside origin are considered "autochthonous" and are thus eligible for entry into the Regional Register, if they were introduced to the regional territory a long time ago and have traditionally been integrated with local breeding practices and agriculture. In addition, those breeds, species, varieties, cultivars, populations and ecotypes are considered autochthonous, which are derived from the previous category through selective breeding based on phenotypic choices.

The TIBR intends to promote initiatives to use the mechanism of the Regional Law and to favour the creation of an integrated system for the conservation and protection of the germ plasm. For this, it can also avail itself of the expertise that exists already in Tuscan research institutes, foremost among them the Istituto di Genetica Vegetale of the National Research Council, which is already involved in programs for the conservation of germ plasm at a local level and which has facilities in Florence, Naples and Bari.

## 14. DEVELOPMENT FUNCTION

14.1. Potential for fostering economic and human development which is socio culturally and ecologically sustainable:

[Describe how the area has potential to serve as a pilot site for promoting the sustainable development of its region or "eco region". Describe how the area has potential to serve as a pilot site for promoting the sustainable development of its region or "eco region"]

One of the most interesting prospects within the TIBR is the launch of a new project of the National Research Council of Italy supported by the Park Authorities and the Ministry of Environment. Details concerning this project are given in the following section 15.1.4. In brief, the BIOSPHERE project intends to develop a research agenda to foster sustainable reintroduction of men to the Island of Pianosa that is currently uninhabited. A "Carbon neutral" community is one of the goals of the project that links research and socio economic development in an unprecedented way. The scientists will investigate how renewable resources and new cultivation methods will be used on the Island of Pianosa to achieve Carbon neutrality of the community.

### 14.2. If tourism is a major activity:

**how many visitors come to the proposed Biosphere Reserve each year?**

During the forty year period between 1960 and 2000, the number of tourists in the TIBR area has practically multiplied by ten, from approximately 340,000 in 1960 to more than 3,100,000 in 2000.

**is there a trend towards increasing numbers of visitors? (Give some figures if possible)**

The most consistent increase in the number of visitors was seen in the sixties and seventies, but the upward trend continued even in the following two decades. Referring only to presence, the mean annual increase between 1991 and 2000 was a little below 4%, even though this average derives from annual figures which have fluctuated considerably between an increase above 12% (1998) and a decrease of 1% (1996). During the same decade, arrivals have been steadily increasing and less subject to fluctuations; the average annual rate was above 5% with variations ranging from circa 11.5% to 0.20%. The different dynamic of presence and arrivals has determined the shortening of the average stay, which decreased from 7 days in 1991 to 6.3 days in 2000. It is interesting to observe that the low point of the decade (6.2 days) was reached already in 1993. After that, the data shows a tendency to fluctuate around stays of 6.4 days. Dividing the arrivals and departures on the basis of destination (hotels or alternative accommodations) shows that during the nineties the importance of alternative accommodations has increased considerably. The average annual rate of arrivals, with regard to those accommodations, has been almost double compared to that of hotels, while the difference in the average annual rate of growth is even more marked for presence, where the rate for the alternative accommodations is almost four times that of hotels.



### **14.2.1. Type(s) of tourism**

[ Study of flora and fauna, recreation, camping, hiking, sailing, horseriding, fishing, hunting, skiing, etc.]

On Elba, specialization on the tourism industry began already at the beginning of the 1950s. The importance of tourism for the economy of the Archipelago, and in particular that of the major islands, is well known. Beach tourism is certainly the most important branch, followed by environmental tourism, especially on the minor islands of the Archipelago. The last few years have seen a slight increase in visits for the purpose of using and observing natural features. Various activities are under way to favour this type of tourism development, mostly thanks to the efforts of the Tuscan Archipelago National Park.

### **14.2.2. Tourist facilities and description of where these are located and in which zone of the proposed biosphere reserve:**

Non-hotel structures in the Tuscan Archipelago have decreased by 47 between 1992 and 1999, going from 303 to 256. However, the most recent years, particularly between 1996 and 1999 have seen a small increase. Moreover, for the period of 1992 to 1996, non-hotel structures and their available beds exceeded hotels and their respective number of beds. By 1999, the majority of non-hotel facilities was made up by bed-and-breakfasts and apartments, followed by, in decreasing order, camping grounds, vacation clubs, farm holidays and other facilities. In 1999, the majority of accommodations in the Tuscan Archipelago, approximately 55%, were non-hotel facilities. In general, available beds have increased in all municipalities of the Tuscan Archipelago between 1970 and 1996.

### **14.2.3. Indicate positive and/or negative impacts of tourism at present or foreseen:**

The development model of the Archipelago has both strong and weak points as well as some imbalances. The main economic activity remains beach tourism, which has environmental, economic and social consequences. From an environmental point of view, the developmental imbalances reduce the overall level of sustainability. They aggravate the impact of economic activities on the environmental balance, pushing the capacity of some of the Archipelago's areas to the limit during some periods of the year. More generally, the margins of compatibility between the environment on the one hand and mass tourism on the other hand seem rather narrow and show a progressive tendency to tighten even more.

**14.3. Benefits of economic activities to local people:**

[Indicate for the activities described above whether the local communities derive any income or benefits directly or indirectly from the site proposed as a Biosphere Reserve and through what mechanism]

Approximately two thirds of the production of wealth and of employment are concentrated in very few productive sectors, at the center of which is tourism, especially beach tourism. This type of development has ensured a relative well-being to a great part of the population. The establishment of the MAB Biosphere Reserve wants to set the goal of diversifying productivity, which means giving particular attention to the reinforcement and possibly relaunching of other sustainable activities that are nonetheless still linked to tourism

## 15. LOGISTIC SUPPORT FUNCTION

### 15.1. Research and monitoring

#### 15.1.1. To what extent has the past and planned research and monitoring programme been designed to address specific management questions in the potential biosphere reserve?

[For example, to identify areas needing strict protection as core areas, or to determine causes of and means to halt soil erosion, etc.].

Up until a few years ago, no comprehensive plans for large scale development of research in the TIBR area were developed. The next paragraphs of this document will highlight, however, that research and monitoring may play a central role in the TIBR. A large number of studies have focussed on several aspects of the abiotic and biotic environment in the area leading to the publication of a large number of scientific papers. Nevertheless, we may affirm that the impact of research and monitoring has been very limited in the area and certainly below expectations. The creation of the TIBR MAB Biosphere Reserve, will offer unprecedented opportunity to facilitate the research and intensify the efforts of the main players (Universities and Research Centres) towards a large scale research and monitoring plan.

#### 15.1.2. Brief description of past research and/or monitoring activities

[Indicate the dates of these activities and extent to which the research and monitoring programmes are of local/national importance and/or of international importance.]

Past research activities in the area of TIBR are the results of rather uncoordinated efforts that have been made separately by different Universities and research groups in Italy and Europe. Some highlights of the most interesting studies that have been made over the last two decades are listed below for the different areas of interest.

##### •Abiotic research and monitoring [climatology, hydrology, geomorphology, etc.]

Most of the research activity has been focussed on geology and geomorphology. The islands of the TIBR offer in fact extraordinary opportunities in this area of science due to their different origins and the variety of substrates that are available. It is almost impossible, to summarize in this document the most important results obtained in this area. For this purpose, a list of references of papers published in international refereed Journals with Impact Factor (ISI Web of Science) is given below. The list illustrates the importance and the impact of the research that has been made in the geographical area of the TIBR islands, thus stressing the potential value of this environment for earth sciences:

List of papers published from 1999 to 2003:

1. Os 186 Os 187 systematics of Gorgona Island komatiites: implications for early growth of the inner core Brandon AD, Walker RJ, Puchtel IS, Becker H, Humayun M, Revillon S *Earth and Planetary Science Letters* 206 (3 4): 411 426 Feb 15 2003



2. Sericitic alteration at the La Crocetta deposit (Elba Island, Italy): interplay between magmatism, tectonics and hydrothermal activity Maineri C, Benvenuti M, Costagliola P, Dini A, Lattanzi P, Ruggieri G, Villa Mineralium Deposita 38 (1): 67 86 Jan 2003
3. New geological data from Gorgona Island (Northern Tyrrhenian Sea) Orti L, Morelli M, Pandeli E, Principi G Ofioliti 27 (2): 133 144 Dec 2002
4. Two stage growth of laccoliths at Elba Island, Italy Rocchi S, Westerman DS, Dini A, Innocenti F, Tonarini S Geology 30 (11): 983 986 Nov 2002
5. The magmatic evolution of the late Miocene laccolith pluton dyke granitic complex of Elba Island, Italy Dini A, Innocenti F, Rocchi S, Tonarini S, Westerman DS Geological Magazine 139 (3): 257 279 May 2002
6. Nb and Ta oxide minerals in the Fonte del Prete granitic pegmatite dike, Island of Elba, Italy Aurisicchio C, De Vito C, Ferrini V, Orlandi P Canadian Mineralogist 40: 799 814 Part 3 Jun 2002
7. A comparison of electromagnetic distortion and resolution of upper mantle conductivities beneath continental Europe and the Mediterranean using islands as windows Simpson F Physics Of The Earth And Planetary Interiors 129 (1.2): 117 130 Jan 1 2002
8. Bortolotti V, Pandeli E, Principi G The geology of the Elba Island: An historical introduction Ofioliti 26 (2A): 79 96 Dec 2001
9. Bortolotti V, Fazzuoli M, Pandeli E, et al. Geology of Central and Eastern Elba Island, Italy Ofioliti 26 (2A): 97 150 Dec 2001
10. Elter P, Pertusati P, Rau A Brief introduction to the geological map of Elba Island by Barberi et al. (1967) Ofioliti 26 (2A): 151 152 Dec 2001
11. Cassano E, Anelli L, Cappelli V, et al. The Island of Elba Northern Tyrrhenian Sea aeromagnetic and gravity data Ofioliti 26 (2A): 153 159 Dec 2001
12. Structural signature and exhumation path of the Gorgona blueschist sequence (Tuscan archipelago, Italy) Ofioliti 26 (2A): 175 186 Dec 2001
13. Pandeli E, Corti S, Franceschelli M, et al. The varicoloured slates of the Grassera Unit (Central Eastern Elba, Tuscany): Petrographical mineralogical data and comparisons with other Tuscan and Ligurian Piedmontese Units Ofioliti 26 (2A): 197 205 Dec 2001
14. Pandeli E, Puxeddu M, Ruggieri G The metasiliciclastic carbonate sequence of the Acquadolce Unit (Eastern Elba Island): New petrographic data and paleogeographic interpretation Ofioliti 26 (2A): 207 218 Dec 2001
15. Elter FM, Pandeli E Structural evolution of anchi /epimetamorphic units of Central and Eastern Elba (Ortano, Acquadolce, Monticiano Roccastrada and Grassera Units) Ofioliti 26 (2A): 219 228 Dec 2001
16. Tanelli G, Benvenuti M, Costagliola P, et al. The iron mineral deposits of Elba Island: State of the art Ofioliti 26 (2A): 239 247 Dec 2001
17. Conticelli S, Bortolotti V, Principi G, et al. Petrology, mineralogy and geochemistry of a mafic dike from Monte Castello, Elba Island, Italy Ofioliti 26 (2A): 249 261 Dec 2001
18. Durand Delga M, Lahondere D, Puccinelli A, et al. Pre meeting transect Corsica Elba Island Southern Tuscany guidebook 1 – Corsica Ofioliti 26 (2A): 303 320 Dec 2001

19. Benvenuti M, Bortolotti V, Conticelli S, et al. 2 Elba Island A – Introduction Ofioliti 26 (2A): 321 330 Dec 2001
20. Benvenuti M, Bortolotti V, Fazzuoli M, et al. B Eastern Elba Ofioliti 26 (2A): 331 345 Dec 2001
21. Coli M, Conticelli S, Pandeli E, et al. C Western Elba Ofioliti 26 (2A): 347 356 Dec 2001
22. Thompson RN, Gibson SA, Dickin AP, et al. Early Cretaceous basalt and picrite dykes of the southern Etendeka region, NW Namibia: Windows into the role of the Tristan mantle plume in Parana Etendeka magmatism J Petrol 42 (11): 2049 2081 Nov 2001

• **Biotic research and monitoring [flora, fauna]:**

Similarly to what has been said above, several independent research activities have been undertaken in the TIBR islands over the last few years. The research concentrated mostly on the identification and the study of rare and new animal and plant taxa on the islands of the Tuscan Archipelago. It is also important to highlight, here that some of the studies have focussed on habitats involved in habitat restoration activities that are of great importance. The following is a list of the most important studies published in international refereed journals is given:

List of papers published from 1999 to 2003:

1. Taxonomy and new bacterial symbioses of gutless marine Tubificidae (Annelida, Oligochaeta) from the Island of Elba (Italy) Giere O, Erseus C Organisms Diversity & Evolution 2 (4): 289 297 2002
2. Genetic monitoring of brackish water populations: the Mediterranean toothcarp *Aphanius fasciatus* (Cyprinodontidae) as a model Maltagliati F Marine Ecology Progress Series 235: 257 262 2002
3. Two Chydoridae species (Crustacea, Cladocera) new to Italy: *Alona rustica* and *Camptocercus uncinatus* Margaritora FG, Vagaggini D, Stoch F Italian Journal of Zoology 69 (1): 59 63 2002
4. Seasonal and geographical differences in cleaner fish activity in the Mediterranean Sea Zander CD, Sotje I Helgoland Marine Research 55 (4): 232 241 Feb 2002
5. Zuffi MAL Diet and morphometrics of *Coluber* (=Hierophis) *viridiflavus* on the island of Montecristo (Tyrrhenian sea, Italy) Herpetol J 11 (3): 123 125 Jul 2001
6. Mora C, Ospina AF Tolerance to high temperatures and potential impact of sea warming on reef fishes of Gorgona Island (tropical eastern Pacific) Mar Biol 139 (4): 765 769 Oct 2001
7. Piazzzi L, Cinelli F Distribution and dominance of two introduced turf forming macroalgae on the coast of Tuscany, Italy, northwestern Mediterranean Sea in relation to different habitats and sedimentation Bot Mar 44 (5): 509 520 Sep 2001
8. Maltagliati F, Camilli L, Lardicci C, et al. Evidence for morphological and genetic divergence in *Perinereis cultrifera* (Polychaeta : Nereididae) from two habitat types at Elba Island J Mar Biol Assoc UK 81 (3): 411 414 Jun 2001

9. Messina G, Ruffo S A new species of Longigammarus (Crustacea Amphipoda, Gammaridae) from the Pianosa Island (Tuscany Archipelago) Ital J Zool 68 (2): 161 164 2001
10. Przybos E, Fokin S Habitat of Paramecium biaurelia in Italy, the Island of Elba Folia Biol Krakow 49 (1 2): 103 104 2001
11. Ferdeghini F, Acunto S, Cocito S, et al. Variability at different spatial scales of a coralligenous assemblage at Giannutri Island (Tuscan Archipelago, northwest Mediterranean) Hydrobiologia 440 (1 3): 27 36 Dec 2000

• **Socio economic research** [demography, economics, traditional knowledge, etc.]:

Historical, demographical and in particular archeological studies have been made in the islands of the TIBR. This is an obvious consequence of the fact that more than 2000 years of history surround this specific environment which has witnessed a great number of cultures and events. Underwater archeology is of special importance, and the area of the TIBR includes some important ship wrecks that have been the subject of interesting and revealing studies. As for the two previous sections, the following list of publications in international refereed Journals gives an idea of the quality and the quantity of research activities on humanities and social issues:

List of papers published from 1980 to 2003:

1. Talbot M La 'gara degli dei', 'Diana su l'Elba' Music Lett 83 (1): 173 175 Feb 2002
2. Themelly P A man of letters for the Revolution. Luigi Serio (1744 1799) Rass Stor Risorgimen 88 (2): 273 274 Apr Jun 2001
3. Powell EA Georgia on my mine (Confederate torpedo excavated on Elba Island) Archaeology 54 (4): 16 16 Jul Aug 2001
4. Burns J Musial: From Stash to Stan the man. Libr J 126 (9): 130 130 May 15 2001
5. Cavallini G A man of letters for the Revolution. Luigi Serio (1744 1799) Stud Probl Crit Test 61: 276 277 Oct 2000
6. Rockwell SL Leaving everything behind: The songs and memories of a Cheyenne woman Am Indian Cult Res J 23 (4): 214 216 1999
7. Sheffer R 'Elba' Midwest Quart 40 (4): 486 488 Sum 1999
8. Gonzales y Reyero O The will of Ulysses and of Dante Lingua Stile 33 (4): 761 762 Dec 1998
9. Sebastio L The flight of Ulysses and of Dante. Further studies of the 'Divina commedia' Critica Lett 26 (3): 603 605 1998
10. Chiodo C The journey of Ulysses and Dante. Other studies on the 'Divina Commedia' Rass Lett Ital 102 (1): 195 195 Jan Jun 1998
11. Fronzoni AG AG Fronzoni with Gianni Bortolotti collaboration with M. Cohen Duplex House Isola di Capraia, Italy 1976 A U Archit Urban (338): 28 + 1998
12. Karon BP, Widener AJ Repressed memories: The real story Prof Psychol Res pr 29 (5): 482 487 Oct 1998
13. Piguard A Napoleon I returns from Elba every year (Yearly reenactment of his March 1, 1815 landing at Vallauris Golfe Juan) Historia (616): 18 19 Apr 1998
14. Narbaitz X Books for exile, Napoleon I's library on the Island of Elba Historia (613): 98 99 Jan 1998



15. Sotty R Acts of the Accademia Romanistica Costantiniana. 9th international conference Italian, French, German, Spanish Crifo, G, Giglio, S Latomus 56 (2): 446 448 Apr Jun 1997
16. Kazan E Mankiewicz, Joe and his own island of Elba positif (386): 64 65 Apr 1993
17. Bound M A Roman Amphora Wreck (Pelichet 47) off the island of Montecristo, Italy Preliminary Report Int J Naut Archaeol 21 (4): 329 336 Nov 1992
18. Riccardi E An obsidian core recovered from the waters of Capraia, Tuscany Int j Naut Archaeol 21 (3): 271 272 Aug 1992
19. Gibbins D the Giglio Wreck A Wreck of the archaic period (c.600 bc) off the tuscan island of Giglio An Account of its discovery and excavation A Review of the main finds bound, M Int J Naut Archaeol 20 (3): 266 267 Aug 1991
20. Whitehouse D Tubi fittili (vaulting tubes) from the sea the roman wreck at Punta del Fenaio, Island of Giglio – Comment Int J Naut Archaeol 17 (2): 182 182 May 1988
21. Chandler Dg The escape from Elba the fall and flight of Napoleon, 1814 15 Mackenzie, N Int Hist Rev 6 (2): 322 325 1984
22. Bound M, Vallintine R A Wreck of possible etruscan origin of Giglio Island Int J Naut Archaeol 12 (2): 113 122 1983
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### **15.1.3. Brief description of on going research and/or monitoring activities:**

New initiatives have recently been launched to develop a comprehensive plan for research in view of the TIBR candidature. One of these, the PianosaLAB Project, perfectly fits the objectives of the MAB Network, especially if it will be complemented by the PianosaLAB BIOSPHERE Project, which will be described in the Section 15.1.4. Other projects are also on-going as described briefly in the following sections:

#### **•Abiotic research and monitoring [climatology, hydrology, geomorphology, etc.]:**

The Geological Service of Italy, in cooperation with the Earth Science Department of the University of Siena, has begun a study and research activity in the Tuscan Archipelago with the goal of describing the area's geology and geomorphology. Particular attention is paid to the island of Pianosa, which is of extreme geo-environmental interest due to the



fact that it has been forcefully isolated for a very long period, a fact that has protected the island from human impact, contrary to the Archipelago's other islands. This has ensured the conservation of an intact ecosystem that is unique in the Mediterranean. After having obtained the regular access permits released by the competent authority in charge of the protection and monitoring of the island, and after having solved the problems regarding logistic arrangements, the researchers of the Geological Service and of the University carried out two survey campaigns in the months of June and September of 2001. During the year 2002, other studies were carried out with, among others, the goals of studying and describing the continental deposits and the in-depth study of some stratigraphic and geomorphological problems that had not yet been solved.

• **Biotic research and monitoring [flora, fauna]**

**The PianosaLAB Project**

The PianosaLAB is a research network in which five Institutes of the National Research Council (CNR) and four Italian University Departments participate in order to create an unprecedented and innovative infrastructure to permit the long-term monitoring of the Island of Pianosa. The data collected in the PianosaLAB will provide a unique opportunity to verify current estimates of regional greenhouse gas fluxes and to validate existing or new models that simulate the effect of the environment and climate on gas exchange. Measurements of gas exchange can quantify interactions and feed-backs of climate and the local terrestrial ecosystem. This is only possible in this isolated site because of its very special topography and because of the complete absence of anthropogenic sources of greenhouse gases. Both those conditions are in fact creating a unique opportunity to measure the total gas exchange over an area composed by a complex mosaic of natural and previously managed ecosystems. The Island of Pianosa is a good analogy for a typical Mediterranean ecosystem where the natural vegetation is currently colonising the abandoned agricultural land and a number of different situations may be actually found. The island is practically uninhabited as it hosts a now closed penitentiary and is still under the administration of the Ministry of Justice. The once flourishing agricultural activity managed by the prisoners has ceased and a secondary succession has begun; a system composed by Mediterranean vegetation is currently colonising the abandoned land and the island is undergoing a process of re-naturalization. The PianosaLAB Project is organized along a series of Workpackages (WPs) as listed below:

**WP1- Soil characterization and heterotrophic processes**

Evaluation of soil condition in relation to land use and past management practices. Quantification of soil organic carbon and potential carbon sequestration. Decomposition of leaf litter and  $^{13}\text{C}$  dynamics in decomposing litter.

**WP2 -Vegetation analyses and ecophysiology**

Map of vegetation. Identification of dominant species. Determination of leaf area index. Ecophysiological analyses of dominant species.

### WP3 - Gas exchanges between vegetation and atmosphere

Measurements of CO<sub>2</sub> and H<sub>2</sub>O fluxes by eddy correlation and an atmospheric profiling system, based on the Vertical Mass Profiler. Measurement of volatile organic carbon (VOC) emissions at leaf scale by portable bag enclosures or mobile chromatograph. Ecosystem VOC flux measurements by Relaxed Eddy Accumulation to quantify the contribution of VOC to ecosystem carbon fluxes.

### WP4 - Isotopic discrimination

Determination of CO<sub>2</sub> isotopic composition in air, in relation to the activities of WP2 and WP3. Analyses of  $\delta^{13}\text{C}$  in foliar, litter and soil samples.

### WP5 - Modeling activities

The validation parameters will be obtained from the results of a specific experimental campaign. The structure and diurnal development of the planetary boundary layer (PBL) will be modeled by means of micrometeorological measurements of profile, eddy-covariance and standard parameters. The results obtained from the study of the boundary layer will be used to perform the box-method analysis capable to define the entire ecosystem exchange process and will be the input data of a three-dimensional fluid dynamic model.

### Participating Organizations:

#### National Research Council of Italy:

- Institute of Agro-forestry and Environmental Biology (IBAF);
- Institute of Biometeorology (IBIMET);
- Institute of Atmospheric Sciences and Climate (ISAC);
- Institute for the Mediterranean Agroforestry Systems (ISAFOM);
- Institute of Ecosystems Studies (ISE).

#### Universities

- Department of Crop Science and Agricultural Engineering, Udine;
- Department of Agronomy and Agroecosystem Management, Pisa;
- Department of Agronomic Sciences and Agroforestry Management, Florence;
- Department of Environmental Sciences, Second University of Naples.

### • Marine research and monitoring [flora, fauna]

ICRAM Central Institute for Research Applied to the Sea, is a non-profit public entity, it provides support to policies implemented by the competent public administrations, makes recommendations, provides consultancy and supports local authorities in co-ordinating their activities in marine protected areas, port dredging and fishing at local level. ICRAM carries out research activities providing technical support for the sustainable use of marine biological resources and to ensure the compatible management of fishing and aquaculture. In addition, it supports the Ministry of the Environment in controlling the quality of the marine environment, gives advice in cases of natural disaster and co-ordinates the activity of research structures within the framework of the Sea Emergency Unit established by the Ministry of the Environment.

Main activities and goals of ICRAM are:

- To contribute to the care and protection of the sea and its resources by means of management, conservation and awareness-building support activities grounded on solid scientific bases and on the principle of precaution;
- To ensure enjoyment of a healthy sea environment, that is sound in terms of biodiversity and living resources, self-sustaining over time and capable of coexisting with man and his needs;
- To support the Administration in the defence and protection of the sea, in three main domains: Protection of the quality of the water and of sea, coastal and lagoon environments. Conservation of marine biological diversity, with special reference to the safeguarding of the habitat and of protected marine species. Sustainable and responsible use of the marine environment and its resources.

ICRAM is the main scientific reference agency available to the public administration on matters regarding marine conservation policy. The existing legislation has entrusted ICRAM with the task of performing research aimed at controlling the phenomena of pollution, assessing the extent of marine biological resources and taking the technical measures required to ensure that sustainable fishery and aquaculture operations are possible. As part of its statutory tasks, ICRAM also provides assistance: to the Sea Defence service of the of the Ministry of the Environment in setting up and operating the network for the observation of the quality of the sea environment, as well as during the preliminary stages of establishing protected marine areas and in the coordination of the research activities carried on therein; to the services responsible for nature and water conservation, for waste disposal and the soil of the Ministry of Agricultural Policies in the sector of technical-scientific investigations; to the General Direction of Fisheries and Aquaculture of the Ministry of Agricultural Policies; to the Crisis Unit set up within the Permanent Interministerial Emergency. Recently ICRAM has proposed to Tuscanian Archipelago National Park to establish an headquarter, based in Portoferraio, to coadiuvate research and monitoring activities.

**•Socio economic research [demography, economics, traditional knowledge, etc.]:**

The CSDE is an initiative of the University of Florence, Department of Literature and Philosophy, with the goal of appreciating the cultural, artistic and historical heritage of the territory that is part of the TIBR. The CSDE, in cooperation with the Elban Association for Scientific and Didactic Promotion, has initiated an important collaboration with the Archaeological Supervisory Authority of Tuscany for the organization of an underwater survey campaign at Pianosa and for a project on Giglio. Currently, surveys are under way at various archaeological sites, as well as underwater monitoring by means of fixed cameras that transmit to monitors on land with the possibility to retransmit the signal to interested bodies and institutes. An example of the services the CSDE can offer to the TIBR is the 1993 installation of three cameras on the seabed (at a depth of 36-38 meters) for the monitoring of the wreck of Giglio Porto. The CSDE also offers logistic and didactic support both on land and in the water to teachers and students of the University of Florence (Dept. of Animal and Genetic Biology) during their exercises in marine biology, to those of the University of Pisa (Dept. of Environmental and Territorial Science) during scientific surveys of subaquatic surfaces, to those of the University of Siena (Dept. of Archaeology and Art History) during surveys on the territory of Elba. It publishes works about the history of Elba and the Tuscan Archipelago and organizes



scientific conferences on topics concerning the politics of the territory, the appreciation of the cultural resources and the environment. It also provides refresher courses to teachers at the state junior high schools and computer courses for the staff of the penitentiary police and the civil staff of the Pianosa Island Prison.

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The HYDRA Institute for Marine Sciences was founded by four German biologists and a geographer to promote scientific investigation of the Mediterranean region, at a scientific research facility equipped to conduct both biological and geographical research, provide educational courses and allow for various field activities including scuba diving. The institute is conveniently located right above the Bay of Fetovaia in the SW of Elba Island, Italy and allows for easy access to the sea and simultaneously provides intriguing land based geological habitats. The Island of Elba therefore offers an ideal base for a comprehensive land and marine based field trips to the Mediterranean region. From the institute a beautiful view on to the peninsula of Fetovaia and the neighbouring islands over to the snow-covered tips of the mountains of Corsica can be observed. The steep high mountains of the Mount-Capanne-massif cause the formation of various vegetation types and plant societies, which are treated intensively during the vegetation-geographical courses. It holds facilities on the Island of Elba where all the year round different scientific activities are conducted. The HYDRA-Institute for Marine Sciences is visited by groups from universities, schools and other institutions for their own field trips and classes. Master students and researchers from different nations use the facilities for their graduate field research. We offer a variety of intensive educational courses during university vacations in spring and summer/early fall such as Mediterranean marine biology and island geography. Every evening an introducing lecture gives the theoretical background for the next day's program. The courses are on the upper undergraduate/graduate level simultaneously providing introductory explanations to beginners or participants of related specific scientific disciplines, allowing for scientists, researchers, specialists, students and general public to gain insight into the biology and ecology of the Mediterranean ecosystems. For your convenience, any group interested in doing a field trip to the HYDRA-Institute can request and pre-arrange individual course programs to accommodate your exact needs. Additionally linked to the institute there is the Centro Marino Elba, a professional diving center run by German scuba instructors according to VDTL-rules (Verband Deutscher Tauchlehrer, German Association of Diving Instructors, Member of CEDIP). The diving center offers complete diving gear for rent, 2 compressors (450l per min each), three larger boats (room for 24 divers or snorkellers) and equipment for sampling, measuring and surveying. The marvellous diversity of the Mediterranean Sea can best be observed, first hand by divers and snorkellers. Because of this, scuba diving plays an important role in our marine courses. Our facilities also include two well-equipped laboratories offering 22 work places each with microscopes, where non divers and divers can both have the breath taking opportunity to observe some of the living



organisms in detail with the help of optical instruments allowing for further study of their various features and adaptations. For demonstration and documentation we provide microscopes and lenses with photographic and video equipment.

The 2003 course program in detail:

All of the courses will be held in German, (though all teachers and staff speak English and other languages including Italian, French, Spanish and Swiss). Scuba diving course is always a possibility, except for course "Methods of UW Research". Medical certification required.

#### Invertebrates of the Mediterranean Sea

This course investigates the world of Mediterranean invertebrates and deepens the knowledge in systematics and morphology: systematic and taxonomy of invertebrate groups, functional morphology and adaptations, life in the natural habitat, ecology of marine invertebrates, and larval development.

#### Marine Coastal Biotopes

Typical coastal biotopes of the Mediterranean Sea as sea grass beds, sandy bottoms, rocky hard bottoms, and the biogenic hard bottoms are presented. Their importance for the whole ecosystem is highlighted and discussed. Characteristic species are observed in their natural environment. Plants and animals are determined and categorised ecologically later on in the lab. Further aspects focus on the environmental problems and anthropogenic threats that the Mediterranean Sea has to continuously face in the future, and ways to manage and preserve our beautiful coastal environments.

#### Introduction to Marine Biology

This course introduces the basics of marine ecological systems. The combination of investigations of the biotic and abiotic environmental factors and studies on the organisms living in this ecosystem gives the tools for the analysis of ecological phenomena and the understanding of actual environmental conflicts. Topics are basic processes in oceanography, seawater chemistry, plankton communities, and the taxonomy and ecology of algae and marine invertebrates.

#### Fishes of the Mediterranean

This new course meets the frequently expressed interest of many guests in this important vertebrate group. The basics of evolution and systematics, zoogeography, morphology, ecology and behaviour of Mediterranean fishes are treated. Field observations and experiments, lab identification, dissection of selected species (fish market and by-catch), analysis of gut content and parasites are performed to gain an over all view of this fascinating group. Guest lecturer is Dr Thomas Paulus, ichthyologist, and author of several papers and a recent book on Mediterranean fishes. He is diving instructor and underwater photographer as well.

#### Methods of Underwater Research

SCUBA diving as a method for biologists, geologists, geographers, archaeologists and other scientists is an effective tool for investigating scientific related research objectives. The use of different equipment, as well as the planning, performance and successful termination of a research project by using scuba is introduced and trained. In order to avoid the potential risks associated with diving, the awareness of safety rules is a priority at Hydra. This methods-orientated course will provide experiences with working under water, under water cartography, measuring, documentation, sampling techniques and a final report. The course is for certified divers only. No diving course is attached.

Forum Unesco: International Campus on the Elba island: Conservation of the Medioeval heritage in the granitic area;

The II Forum Unesco held in Lucca was funded by the National Park of the Tuscan Archipelago and was focussed on the historical and archaeological heritage of the area of Mount Capanne. Main topic of the studies concerned buildings and churches of the medioeval era.

The International marine biology and applied ecology centre "G. Bacci" of Livorno, is involed in monitoring activities on marine fauna of the archipelago. The researc are part of the project "Grund 5A18 of the Ministry of the Agriculture and Forest"

National institute for wild fauna of Bologna

The Institute promoted introductive studies on the wild goat population of the Montecristo's island in order to assess the demographic status of the specie.

The National Park in collaboration with the University of Turin started specific studies on the mufflons popolutaion on Capraia and Elba islands. The research focussed on the healt and demographic status of the mufflos

#### **15.1.4. Brief description of planned research and/or monitoring activities:**

##### **•Abiotic research and monitoring [climatology, hydrology, geomorphology, etc.]:**

There are no organised plans, at present, for coordinated future research on the abiotic environment. We expect, however, that the participation of the TIBR in the Biosphere Reserve Network will provide an opportunity to enhance the collaboration with scientists, in this area of research.

##### **•Biotic research and monitoring [flora, fauna]:**

The activities of the PianosaLAB will contiunue in the next years. It is expected, depending on funding that will be made available by the Italian Ministry of Environment, that other research projects, similar to the PianosaLAB, will be initiated in the future. The participation of the TIBR in the MAB Biosphere Network will provide an extraordinary opportunity to attract new funds to the Tuscan Archipelago and propose the creation of other research laboratories like the MonteCristoLAB, the GiannutriLAB etc. that will finally create the basis of the TIBR\_LAB Network to be extended over the entire territory of the MAB Biosphere Reserve. Plans already exist to extend the activities of the PianosaLAB to the terrestrial fauna and to the marine ecosystems

##### **• Socio economic research [demography, economics and traditional knowledge]:**

The Pianosa-BIOSPHERE Project is one of the initiatives planned by the PianosaLAB. The idea that is behind this is that "in order to be sustainable, a human society, irrespective of its scale and dimension, must be carbon neutral". Where carbon neutrality means, here, that the balance between emissions of carbon dioxide (and other greenhouse gases) caused by the human activities and the uptake of CO<sub>2</sub> by the terrestrial vegetation must match or be close to zero. The Island of Pianosa is likely the only place in the Mediterranean region where such a measurable objective can actually

be tested experimentally. This is because on Pianosa it is possible to accurately measure how many grams of carbon dioxide are taken up by the terrestrial ecosystems every second, day or year and plan human re-colonization where every single aspect of the sustainable development of a small human community can be planned, analysed and verified.

The Island of Pianosa can become, in the perspectives of the proposed project, a place where nature, man and human activities are integrated into a sort of Biosphere at zero-emission. This will fit entirely the objectives of the MAB Biosphere Reserve Programme, with all the benefits, from research to demonstration, education and promotion that such an ambitious objective may generate. In this phase, the objectives and plans of the project do not depend on the type of colonization that will be made on the island. This is in fact a choice to be made at the political level with harmonization of the interests and requirements of the populations and the local economies living in the area of the National Park of the Tuscan Archipelago. The Pianosa-BIOSPHERE project has, however, a precise roadmap, that requires extensive collaboration between several partners and institutions that hardly worked together in the past:

- *Ecologists and micrometeorologists* are needed to measure with rigorous and reliable methods the C-balance of the entire island and associated perturbations
- *Engineers* are required to propose new economically sustainable strategies to obtain energy from renewable resources
- *Architects* are necessary to adopt the principles of bio-climatic architecture in the refurbishment of the existing buildings and infrastructure
- *Agriculturalists* are required to design and optimize new methods for land management and the sustainable production of resources and biomass for energy production
- *Forest scientists* and planners are required to design and promote the re-naturalization of the island, afforestation and carbon farming programs
- *Environmentalists* are required to plan and reinforce sound nature protection measures to favor the integration of human activities with the environment
- *Economists* are required to calculate and plan an appropriate balance between in and outgoing financial resources of the system and to plan the human activities
- *Policy makers* are also an essential part of the plan as they must support the initiative, create the premises of a successful project and provide the appropriate political support to the initiative
- *Media experts* are required to promote and disseminate the results of the projects

**15.1.5. Estimated number of national scientists participating in research within the proposed biosphere reserve on**

- a permanent basis: 10
- an occasional basis: 25

**15.1.6. Estimated number of foreign scientists participating in research within the proposed Biosphere Reserve on**

- a permanent basis: 0
- an occasional basis: 8



**15.1.7. Estimated number of masters and/or doctoral theses carried out on the proposed biosphere reserve each year:**

The National Park Authorities have organized a prize for master theses over the last few years. More than 20 original manuscripts have been submitted every year for the prize. We expect that the implementation of the TIBR will boost the number of students that will be attracted and, consequently, the number of master and PhD theses that will be carried.

**15.1.8. Research station(s) within the proposed Biosphere Reserve:**

[...] = permanent

[2] = temporary

**15.1.9. Permanent research station(s) outside the proposed Biosphere Reserve:**

[If no permanent research station exists within the proposed Biosphere Reserve, indicate the location, distance to the core area, name and address of the most relevant research station]

The TIBR initiative will link to a number of initiatives and research centres located outside the Biosphere Reserve Area. Among these, the COMMA-MED (Centro Meteorologia Marina del Mediterraneo) in Livorno and the CRES (Centro Ricerche Erosione del Suolo), Grosseto are among the most active. In particular, COMMA-MED, a joint initiative of the National Research Council, is a research station dealing with the most important applicative aspects of coastal meteorology and environmental analysis. This research station will provide regular updates on the weather conditions and forecast that in the end will be made available to the TIBR visitors. COMMA-MED will make use of up to date methodologies and tools (Meso-Scale Atmospheric Modelling and PC-clusters) to provide this type of information. It is expected that the PianosaLAB and COMMA-MED will establish a link. CRES activities, in Grosseto, will deal, instead, with the study of soil erosion at the Regional Scale. Although no firm research plans exist yet for studies and projects on the islands of the Tuscan Archipelago, we expect CRES and Comma-MED to develop new initiatives in the TIBR area in the near future. Moreover the laboratory "G. Bacci" di Livorno (Centro Interuniversitario di Biologia Marina ed Ecologia Applicata) is involved in monitoring activities of the marine environmental.

**15.1.10 . Permanent monitoring plots**

[Indicate the year established, the objective of monitoring, the type and frequency of observations and measurements, and whether an internationally recognized protocol is being used, for example the Smithsonian MAB MAPMON protocol for monitoring forest biodiversity]:

The PianosaLAB has already established in the year 2000 the first Permanent Monitoring Plot (PMP) of the TIBR. The size of this PMP matches the size of the island extending over approximately 1000 ha. Observations are made continuously involving the atmosphere and the biosphere. Soil and vegetation dynamics are considered in



particular by means of periodic samples of soil organic matter and above ground biomass. The automatic monitoring station existing in the PianosaLAB also ensures continuous monitoring of the Net Ecosystem Exchange of the Island Ecosystem. All the measurements made in this PMP strictly follow the Protocols established by EUROFLUX and, more recently by the FLUXNET initiative that is the Global Network of Flux Monitoring Stations, which is sponsored by NASA and comprises more than 250 sites worldwide.

Biodiversity Plots are also to be created within the PianosaLAB. For this, areas will be selected within the TIBR to contain species representative of and endemic to the ecosystem. The plot will be located within one vegetation type to give a true representation of the area's diversity. The botanist, aided by cartographic information, remote sensing photographs, and field verification techniques such as vegetation transects, will help determine the initial siting of the plot. The forest plots will be established according to Dallmeier (1992). Data collected in the field will be entered into the Biodiversity Monitoring Database (BioMon) that enables users to efficiently manage the complex spatial and temporal data collected and to prepare a preliminary analysis. In addition, it facilitates the process of field verification by producing maps of the individual tree and species locations.

#### References

*Dallmeier, F. (1992). "Long-term monitoring of biological diversity in tropical forest areas." Methods for establishment and inventory of permanent plots. MAB Digest Series, 11. UNESCO. Paris.*

#### 15.1.11. Research facilities of research station(s)

[meteorological and/or hydrological station, experimental plots, laboratory, computerized databases, Geographical Information System, library, vehicles, etc.]:

##### Automatic weather station

An automatic weather station (Weather SAT-1) already exists in the Island of Pianosa. This permits long-term and continuous monitoring of weather conditions using WMO standards. The satellite link also makes it possible to collect the data remotely. More stations will be installed by the TIBR, over the most interesting areas of the territory. Some attention will be paid the characterization of the most severe rainfall gradients in the Island of Elba and possibly Giglio and Capraia.

##### Flux Monitoring System

An instrumented field network for long-term atmospheric monitoring, an eddy-covariance flux tower and associated air sampling facility for isotopic determinations has been established by the PianosaLAB during the winter of 2002. The net ecosystem flux of carbon from vegetation-covered areas is measured using the eddy covariance technique. The objective of the measurements is to characterise the Pianosa Island ecosystem's carbon budget at scales from the leaf to the whole canopy using measurements made with conventional small scale techniques, such as leaf photosynthesis and respiration of plant components and detritus, alongside eddy covariance measurements. Ecosystem fluxes of CO<sub>2</sub>, H<sub>2</sub>O, momentum, sensible and

latent heat were measured using the eddy covariance technique. The system used consists of commercially available instrumentation: a 3 axis symmetrical sonic anemometer (Metek Usa-1, Metek GmbH, Elmshorn, Germany), an infra-red gas analyser (IRGA Li 7500, Li-COR, Lincoln, Nebraska, USA) in open path mode and a software (EDIRE, IERM Edinburgh) which calculated the fluxes in post processing. The eddy-covariance tower has been assembled in the proximity of the geometric centre of the island, at a height of 12 m, representing a footprint extending for most of the upwind vegetation-covered surface (almost 90% of the total area). The eddy covariance tower is equipped with the standard sensors used by the Fluxnet network.

#### **15.1.12. Other facilities**

[e.g. facilities for lodging or for overnight accommodation for scientists etc.]:

The National Park of the Tuscan Archipelago owns various types of lodging and accommodation facilities spread over the TIBR area.

#### **15.1.13 .Does the proposed biosphere reserve have an Internet connection?**

It is our intention to create the TIBR Web Page and manage the connection to the Internet with a server connected to ADSL.

### **15.2. Environmental education and public awareness**

[Environmental education sometimes now referred to as education for sustainable development can be aimed at schoolchildren, the adult population of the local communities, and visitors from home and abroad].

We expect the TIBR to be able to apply to the periodic Calls for Proposals that are launched by the Ministry of Research and Education in Italy. Annual projects for the spread of scientific culture, a program that is expected to continue in the next years, will provide the opportunity to start new activities in this area. At present a number of environmental education and public awareness programs are on-going in the TIBR area, which are mainly organized and managed by the National Park. All the details of the initiatives are provided regularly on the Park Web Pages .

#### **15.2.1 Describe environmental education and public awareness activities, indicating the target group(s):**

The Parks containing the core and buffer areas have a long history of providing educational services. These include comprehensive programs for pre-school, primary, secondary and tertiary institutions and specialist groups. Delivery is usually by rangers in the field and includes a combination of ranger talks, guided walks and/or hands-on education and conservation activities in which students achieve greater knowledge of environmental issues and management strategies. Besides students, other target groups include local, national and international special interest groups (e.g. bird observers), and community groups including retirees.

**15.2.2. Indicate facilities for environmental education and public awareness activities [visitors' centre; interpretative programmes for visitors and tourists; nature trails; ecomuseum demonstration projects on sustainable use of natural resources]:**

The parks forming the core and buffer areas already have visitor centres, interpretative programs for visitors and tourists; and nature trails. It is proposed to create new centres for sustainability outside core and buffer areas within the transition area. These centres will be a major feature of the Biosphere Reserve. Ecotourism involving private tour operators and associated infrastructure (accommodation, transport, etc) is also expected to make a major contribution.

**15.3 Specialist training**

**[Acquisition of professional skills by managers, university students, decision makers etc.]**

[Describe specialist training activities: for example research projects for students; professional training and workshops for scientists; professional training and workshops for resource managers and planners; extension services to local people; training for staff in protected area management]

Specialist training will involve the following approaches:

- Offering post graduate research scholarships
- Seminars for key decision makers and community leaders
- Staff and student exchange programs with other Biosphere Reserves
- Offering specialist short courses
- Workshops for resource managers and planners
- Extension services to local people
- Field excursions

**15.4 Potential to contribute to the World Network of Biosphere Reserves**

[Collaboration among biosphere reserves at a national, regional and global level in terms of exchange of scientific information, experience in conservation and sustainable use, study tours of personnel, joint seminars and workshops, Internet connections and discussion groups, etc. ]

The proposed Biosphere Reserve has a very significant potential to contribute to the World Network of Biosphere Reserves. In the case of the relationships with Biosphere Reserves in other countries, the issues of land and water degradation, and challenges of sustainable development close to a significant population centre, are highly relevant. Moreover, the ready access to research institutions and availability of sophisticated monitoring systems should provide leadership in pursuing Biosphere Reserve goals. The presence of towns and cities in this proposed Biosphere Reserve also provides new studies in research and monitoring as the world becomes more urbanised.

**15.4.1. Collaboration with existing biosphere reserves at the national level (indicate on going or planned activities):**

It is planned to maintain and strengthen this national collaboration after nomination.

**15.4.2. Collaboration with existing biosphere reserves at the regional or subregional levels, including promoting transfrontier sites and twinning arrangements (indicate on going or planned activities)**

[Here, "regional" refers to the regions as Africa, Arab region, Asia and Pacific Latin America and the Caribbean, Europe. Transfrontier biosphere reserves can be created by two or more contiguous countries to promote cooperation to conserve and sustainably use ecosystems which straddle the international boundaries. Twinning arrangements usually consist of agreements between sites located at some distance in different countries to promote activities such as cooperative research projects, cultural exchanges for schoolchildren and adults, etc.]

No such plans at present, but the possibility will be investigated once official biosphere designation is given.

**15.4.3 Collaboration with existing biosphere reserves in thematic networks at the regional or international levels (indicate ongoing and planned activities)**

[Networks of sites which have a common geographic theme such as islands and archipelagoes, mountains, or grassland systems, or a common topic of interest such as ecotourism, ethnobiology etc.]

No such plans at present, but the possibility will be investigated once official biosphere designation is given.

**15.4.4 Collaboration with existing biosphere reserves at the international level (indicate ongoing and planned activities:**

[Notably through Internet connections, twinning arrangements, bilateral collaborative research activities, etc.]

No such plans at present, but the possibility will be investigated once official biosphere designation is given



## 16. USES AND ACTIVITIES

### 16.1 Core Area(s):

#### 16.1.1 Describe the uses and activities occurring within the core area(s):

[While the core area is intended to be strictly protected, certain activities and uses may be occurring or allowed, consistent with the conservation objectives of the core area ]

The Core Areas are territorial environments that have a superior naturalistic-environmental value, in which the development of the existing habitats and fauna communities of national and/or international interest and the functioning of the ecosystem must be ensured. In these zones, the need to protect the soil, subsoil, flora and fauna supercedes all other needs and the natural environment is preserved in its current and potential integrity. Use of these environments must be strictly scientific, didactic and cultural; interference and activities that are permitted and necessary are those that are strictly conservational, especially if they are connected to the restoration of the ecological functioning for the protection of the autochthonous fauna and flora of the TIBR. All other interference, uses and activities that are in opposition to the conservational purpose and to the limited use of the area are prohibited.

#### 16.1.2. Possible adverse effects on the core area(s) of uses or activities occurring within or outside the core area(s):

(Indicate trends and give statistics if available)

- forest cutting activities, with the exception of operations with the exclusive purpose of ensuring the natural restoration of the ground cover including the cleaning and mechanical removal of infesting alien species;
- excavation and movement of terrain;
- construction or installation of any man-made product, including fences, that might alter the condition of the sites.

### 16.2. Buffer zone(s)

#### 16.2.1 Describe the main land uses and economic activities in the buffer zone(s):

[Buffer zones may support a variety of uses which promote the multiple functions of a Biosphere Reserve while helping to ensure the protection and natural evolution of the core area(s).]

The Buffer Zones are territorial environments adjacent to the Core Areas with an elevated naturalistic-environmental value. Inside these zones, agricultural, forestry, fishing and tourism activities are allowed as long as they are compatible with the conservation of the Core Areas. In particular, activities include the maintenance of existing buildings, the conservation of the artistic and architectural heritage, management of viability and water resources, incentives for agricultural practices with reduced impact on the environment, and the naturalistic restoration of degraded or abandoned forests and agricultural areas, even by means of offering incentives.

In the Buffer zones will be created some infrastructures for agro-silvo-pastorali activities and handcraft. These interventions will be defined later on considering the naturalistic values distribution

16.2.2 . Possible adverse effects on the buffer zone(s) of uses or activities occurring within or outside the buffer zone(s) in the near and longer terms:

- use of water for agricultural purposes;
- use of synthetic fertilizers and pesticides;
- poaching, both on land and in the sea;
- uncontrolled mining activities;
- urbanization of the coasts;
- shipbuilding activities;
- fishing;
- uncontrolled influx of tourists.

### 16.3. Transition area

[The Seville Strategy gave increased emphasis to the transition area since this is the area where the key issues on environment and development of a given region are to be addressed. The transition area is by definition not delimited in space, but rather is changing in size according to the problems that arise over time. Describe briefly the transition area as envisaged as the time of nomination, the types of questions to be addressed there in the near and the longer terms. The size should be given only as an indication]

16.3.1 Describe the main land uses and major economic activities in the transition area(s):

The Transition Areas are environments which, even though they have been profoundly altered by human intervention, are integral parts of the TIBR since they are suitable to accommodate activities and facilities helpful for the use and appreciation of the TIBR and for the economic and social development of the local communities. This includes residential activities, and activities related to crafts, hospitality, tourism, agricultural tourism, recreation and sport, with the relevant facilities and infrastructure. Compatible uses and activities are those described as urban and residential. Permitted and necessary interference and activities are those designed for the requalification of urbanized areas and of the architectural heritage, for the restitution of items of historical-cultural interest, and for the transformation of built-up areas and their urban and architectural reorganization. The uses and activities, as well as interference and actions taking place in this Area are governed by the following principles:

- favour the development and requalification of urban assets so that they may respond to the needs and expectations of the local population, improve the quality of services and increase the opportunities of use of the TIBR;
- favour the integration within the environmental and territorial context of the TIBR by controlling its accessibility from the urban areas;
- eliminate or lessen the negative impact on the landscape and environment of previous and current urban developments, opposing in particular any developmental tendencies that might compromise the functioning of the TIBR, and favouring the development of facilities and services of interest to the TIBR that are designed for the redrawing of the margins and recompositions of the urban features;

- avoid or restrain infrastructural developments, in particular road networks, that might create traffic flows or have other consequences with a negative effect on the protection of the resources and the image of the TIBR;
- direct interventions towards the recovery of existing architectural heritage and the protection of historical buildings or buildings of environmental value.

16.3.2 Possible adverse effects of uses or activities on the transition area(s):

- use of water for agricultural purposes;
- use of synthetic fertilizers and pesticides;
- industrial activities;
- poaching, both on land and in the sea;
- uncontrolled mining activities;
- urbanization of the coasts;
- shipbuilding activities;
- fishing;
- uncontrolled influx of tourists.

## 17. INSTITUTIONAL ASPECTS

### 17.1. STATE, PROVINCE, REGION OR OTHER ADMINISTRATIVE UNITS:

[List in hierarchical order administrative division(s) in which the proposed Biosphere Reserve is located (e.g. state(s), counties, districts)]

Country: **Italy**  
 Region: **Tuscany**  
 Provinces: **Livorno and Grosseto**

### 17.2 UNITS OF THE PROPOSED BIOSPHERE RESERVE:

[Indicate the name of the different units (as appropriate) making up the core area(s), the buffer zone(s) and the transition area..)

The TIBR will contain the entire territory of the following municipalities:

- Campo nell'Elba,
- Capoliveri,
- Capraia Isola,
- Isola del Giglio,
- Marciana,
- Marciana Marina,
- Porto Azzurro,
- Portoferraio,
- Rio Marina
- Rio nell'Elba

Parts of the territory of the municipality of Livorno in the area of the TIBR are the islands of Gorgona and Capraia.

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#### 17.2.1. Are these units contiguous or are they separate?

[A biosphere reserve made up of several geographically separate units is called a "cluster biosphere reserve". Please state if this is the case of the proposal.]

The unit must be considered contiguous in that it is made up of islands, i.e. defined pieces of territory, connected by the sea between the islands. These units must be considered contiguous because the entire Archipelago is part of the "Santuario dei Cetacei (Legge n° 391/2001)" as an element of protection.

### 17.3. Protection Regime of the core area(s) and, if appropriate of the buffer zone(s)

#### 17.3.1. Core area(s):

[Indicate the type (e.g. under national legislation) and date since when the legal protection came into being and provide justifying documents (with English or French summary of the main features)]

- D. M. Ambiente n. 177 del 21.07.1989 perimetrazione provvisoria e salvaguardia Parco Nazionale Arcipelago Toscano modificato successivamente con D. M. Ambiente del 29.08.1990;



- Legge n. 394, del 06.12.1991 concernente norme quadro in materia di aree naturali protette;
- Delibera Regione Toscana n. 57 del 14.02.1996 sulla costituzione dell'Ente Parco Nazionale dell'Arcipelago toscano adempimenti regionali;
- D. P. R. 22.07.1996 e ampliamento con D. M. Ambiente 19.12.1997 per l'area marina di Pianosa in cui viene istituito il Parco Nazionale Arcipelago Toscano.

#### 17.3.2 Buffer zone(s):

[Indicate the type (e.g. under national legislation) and date since when the legal protection came into being and provide justifying documents (with English or French summary of the main features. If the buffer zone does not have legal protection, indicate the regulations that apply for its management.)

- D. M. Ambiente n. 177 del 21.07.1989 perimetrazione provvisoria e salvaguardia Parco Nazionale Arcipelago Toscano modificato successivamente con D. M. Ambiente del 29.08.1990;
- Legge n. 394, del 06.12.1991 concernente norme quadro in materia di aree naturali protette;
- Delibera Regione Toscana n. 57 del 14.02.1996 sulla costituzione dell'Ente Parco Nazionale dell'Arcipelago toscano adempimenti regionali;
- D. P. R. 22.07.1996 e ampliamento con D. M. Ambiente 19.12.1997 per l'area marina di Pianosa in cui viene istituito il Parco Nazionale Arcipelago Toscano.

#### 17.4. Land use regulations or agreements applicable to the transition area (if appropriate)

- Legge 490/1999: tutela delle bellezze paesaggistiche
- L. 1150/42: legge sulla pianificazione urbanistica
- R.D. 3267/23: legge sul vincolo idrogeologico
- L.R. Toscana n. 5/95 e 52/99: pianificazione territoriale
- L.R. Toscana n. 39/00: legge forestale
- L.R. 56/00: tutela della biodiversità
- Legge n. 394, del 06.12.1991 concernente norme quadro in materia di aree naturali protette;
- Legge n. 1497 del 29.06.1939
- Legge n. 183 del 18.05.1989
- Legge n. 1939 del 01.06.1939

#### 17.5. Land tenure of each zone:

[Describe and give the relative percentage of ownership in terms of national, state/provincial, local government, private ownership, etc. for each zone.]

##### 17.5.1. Core area(s):

100% State Government ownership

#### 17.5.2. Buffer zone(s):

70 % State Government ownership  
30 % Private ownership

#### 17.5.3. Transition area(s):

20 % State Government ownership  
80 % Private ownership

#### 17.5.4. Foreseen changes in land tenure:

[Is there a land acquisition programme, e.g. to purchase private lands, or plans for privatization of state owned lands?]

There are no major changes expected in the land tenure of the transition zone. Minor acquisitions and sales occur from time to time but these decisions will not impact on the character or the general arrangement of land tenure in the transition zone in the foreseeable future.

#### 17.6. Management plan or policy and mechanisms for implementation

[The Seville Strategy recommends promoting the management of each biosphere reserves essentially as a "pact" between the local community and society as a whole. Management should be open, evolving and adaptive. While the aim is to establish a process leading to elaborating a comprehensive management plan for the whole site reflecting these ideas, this may not yet exist at the time of nomination. In this case however, it is necessary to indicate the main features of the management policy which is being applied to guide land use.]

The management of the TIBR is the legal responsibility of the Tuscan National Park Authorities..

##### 17.6.1 Year of start of implementation of management plan or land use policy:

Following successful nomination of the TIBR, it is expected that planning and implementation of Biosphere Programs would start immediately, in the year 2003. Nevertheless it might be considered that the National Park of the Tuscan Archipelago had managed those areas, since 1996

##### 17.6.2 Main features of management plan or land use policy and means of application

[For example through contractual agreements with landowners or resource users, financial incentives etc.]:

The main elements of conservation, education, research and monitoring, public involvement and networking will be implemented through extensive community involvement. Community involvement will take the form of active participation in TIBR management; collaboration on different research, education and networking initiatives;

and the solicitation of funding to support the above. Municipal governments in particular, as authorities, will be closely involved in all initiatives.

### 17.7. Personnel

#### 17.7.1 Total number of staff of proposed biosphere reserve:

[Provide estimates of the total existing number of personnel, including part time personnel, working at the proposed Biosphere Reserve]

The Permanent staff of the National Park of the Tuscan Archipelago amount to 25 people plus 10 external collaboratories. The Corpo Forestale dello Stato (42 people) is in charge of the environmental safety

#### 17.7.2. Number of staff for administrative and resource management:

- permanent: 67
- part time: 10

#### 17.7.3. Number of national staff for research:

- permanent: 3
- part time: 0

#### 17.7.3. Number of technical support staff:

- permanent: 1
- part time: 4

### 17.8. Financial source(s) and yearly budget:

[Biosphere reserves require technical and financial support for their management and for addressing interrelated environmental, land use, and socio economic development problems. Indicate the source and the relative percentage of the funding (e.g. from national, regional, local administrations, private funding, international sources etc.) and the estimated yearly budget in the national currency]

Current balance is 2.500.000 Euro

### 17.9. Authority in charge of administration

#### 17.9.1. The proposed biosphere reserve as a whole:

Name: Tuscan Islands Biosphere Reserve (TIBR)

If appropriate, name the National (or State or Provincial) administration to which this authority reports: Ministero dell'Ambiente

### 17.9.2. The core area(s):

[Indicate the name of the authority or authorities in charge of administering its legal powers (in original language with English or French translation)]

Name(s): Ruggiero Barbetti  
Legal powers: Commissario dell'Ente

Name(s): SERVIZIO V- Ministero Risorse Agricole, Alimentari e Forestali Gestione  
Ex ASFD – Solo per l'Isola di Montecristo

Name(s): Fausto Martinelli  
Legal power: Coordinatore

### 17.9.3. The buffer zone(s)

Name(s): Ruggiero Barbetti  
Legal powers: Commissario dell'Ente

### 17.9.4 . Mechanisms of consultation and coordination among these different authorities:

(For example through consultative meetings, the designation of a special coordinator or facilitator to maintain contacts with all stakeholders and actors.)

## 17.10. Local organizational arrangements

The idea to pursue the TIBR was generated by community members living on the Tuscan Archipelago, whose interest is due to the National Park activities since 1996. The National Park has organized workshops, brochures, community meetings, presentations, information days, forums, briefings, articles in local and statewide media to sensitize the local community to environmental issues.

17.10.1. Indicate how and to what extent the local communities living within and next to the proposed biosphere reserve have been associated with the nomination process (For example through public hearings, participation of local authorities at preparatory meetings, etc)

Recently the Park Authorities held a meeting (Portoferraio, 19 May, 2003) to present the nomination of the Tuscan Archipelago as Biosphere Reserve to the local community and stakeholders. The Italian Minister of the Environment attended the meeting.

17.10.2. Indicate how and to what extent the local communities can participate in the formulation and the implementation of the management plan or land use policy:

The local community will be directly involved in the development of the organising body consistent with the principles described and in the ongoing management of the TIBR, and in addition have the opportunity to participate in management plans for the core and buffer areas together with the projects and programs sponsored by the Biosphere Foundation and the National Park of the Tuscan Archipelago.



## 18. SPECIAL DESIGNATIONS:

[Special designations recognize the importance of particular sites in carrying out the functions important in a biosphere reserve, such as conservation, monitoring, experimental research, and environmental education. These designations can help strengthen these functions where they exist or provide opportunities for developing them. Special designations may apply to an entire proposed biosphere reserve or to a site included within. They are therefore complementary and reinforcing of the designation as a biosphere reserve. They are therefore complementary and reinforcing to designation as a biosphere reserve. Check each designation that applies to the proposed biosphere reserve and indicate its name]

Name:

☒ UNESCO World Heritage Site

In 1990, the island of Elba has been added to the "World Heritage List of Geological Sites" of the UNESCO, due to features connected to the mineral heritage of the island

☐ RAMSAR Wetland Convention Site

☒ Other international conservation conventions/directives

[Please specify]

European Council Directive 92/43/EEC "Habitat"  
(all Tuscan Archipelago)

European Council Directive 79/409/EEC on the Conservation of Wild Birds  
(all Tuscan Archipelago, except for Elba and Giglio islands)

☐ Long term monitoring site [Please specify]

☐ Other. [Please specify]

## 19. SUPPORTING DOCUMENTS (to be submitted with nomination form)

[Clear, well labelled maps are indispensable for evaluating Biosphere Reserve proposals. The maps to be provided should be referenced to standard coordinates wherever possible.]

### ( ) General location map

A GENERAL LOCATION MAP of small or medium scale must be provided showing the location of the proposed Biosphere Reserve, and all included administrative areas, within the country, and its position with respect to major rivers, mountain ranges, principal towns, etc.

### ( ) Biosphere Reserve zonation map (large scale, preferably in black & white for photocopy reproduction)

[A BIOSPHERE RESERVE ZONATION MAP of a larger scale (1:25,000 or 1:50,000) showing the delimitations of all core area(s) and buffer zone(s) must be provided. The approximate extent of the transition area(s) should be shown, if possible. While large scale and large format maps in colour are advisable for reference purposes, it is recommended to also enclose a Biosphere Reserve zonation map in a A 4 writing paper format in black & white for easy photocopy reproduction.]

### ( ) Vegetation map or land cover map

[A VEGETATION MAP or LAND COVER MAP showing the principal habitats and land cover types of the proposed Biosphere Reserve should be provided, if available].

### ( ) List of legal documents (if possible with English or French translation)

[List the principal LEGAL DOCUMENTS authorizing the establishment and governing use and management of the proposed Biosphere Reserve and any administrative area(s) they contain. Please provide a copy of these documents, if possible with English or French translation].

### ( ) List of land use and management plans

[List existing LAND USE and MANAGEMENT PLANS (with dates and reference numbers) for the administrative area(s) included within the proposed Biosphere Reserve. Provide a copy of these documents]

### ( ) Species list (to be annexed)

[Provide a LIST OF IMPORTANT SPECIES (threatened species as well as economically important species) occurring within the proposed Biosphere Reserve, including common names, wherever possible.]

### ( ) List of main bibliographic references (to be annexed)

[Provide a list of the main publications and articles of relevance to the proposed biosphere reserve over the past 5 10 years].

## 20. ADDRESSES

### 20.1 Contact address of the proposed biosphere reserve:

[Government agency, organization, or other entity (entities) to serve as the main contact to whom all correspondence within the World Network of Biosphere Reserves should be addressed.]

Name: **Ente Parco Nazionale Arcipelago Toscano**  
 Street or P.O. Box: **Via Guerrazzi, 1**  
 City with postal code: **Portoferraio 57037**  
 Country: **Italy**  
 Telephone: **0039.565.919411**  
 Telefax (or telex): **0039.565.919428**  
 E mail: **parco@isoleditoscana.it**

### 20.2. Administering entity of the core area:

Name: **Ente Parco Nazionale Arcipelago Toscano**  
 Street or P.O. Box: **Via Guerrazzi, 1**  
 City with postal code: **Portoferraio 57037**  
 Country: **Italy**  
 Telephone: **0039.565.919411**  
 Telefax (or telex): **0039.565.919428**  
 E mail: **parco@isoleditoscana.it**

Name: **SERVIZIO V- Ministero Risorse Agricole, Alimentari e Forestali**  
**Gestione Ex ASFD**  
 Street or P.O. Box: **Via Carducci, 5**  
 City with postal code: **00100 Roma**  
 Country: **Italy**  
 Telephone: **0039.6.46657107**  
 Telefax (or telex): **0039.6.4820660**

### 20.3. Administering entity of the buffer zone:

Name: **Ente Parco Nazionale Arcipelago Toscano**  
 Street or P.O. Box: **Via Guerrazzi, 1**  
 City with postal code: **Portoferraio 57037**  
 Country: **Italy**  
 Telephone: **0039.565.919411**  
 Telefax (or telex): **0039.565.919428**  
 E mail: **parco@isoleditoscana.it**

Progetto della monografia a cura di Sofia Pezzati e Francesca Camilli

Titolo del quaderno:

## **LA CARTA DECORATA**

### *Capitolo 1*

- Cenni storici sulla carta e sua lavorazione con particolare riferimento all'Italia, alla carta decorata e ai suoi usi,

### *Capitolo 2*

- Le varie tipologie di carta decorata prodotte in Italia

Serie di SCHEDE sulle tipologie decorative della carta.

Ogni scheda è così articolata:

1. fotografia della carta e del motivo decorativo
2. didascalia descrittiva
3. metodo di lavorazione
4. strumenti di lavorazione
5. usi (per esempio nell'oggettistica)
6. le botteghe

- La carta fiorentina

Serie di schede sulla carta fiorentina (articolate in base allo schema tracciato sopra)

### *Capitolo 3*

- Aziende artigiane storiche
- Siti internet consultabili
- Le associazioni nazionali della carta
- Le associazioni internazionali della carta
- Le "scuole" di fabbricazione della carta

### *Appendice*

- Breve guida/manuale "fai da te" per la fabbricazione della carta:

1. una serie di fotografie sui principali passaggi della lavorazione della carta
2. didascalie descrittive dei metodi di lavorazione
3. didascalie descrittive degli strumenti di lavorazione

- Bibliografia