"Management Plan of Torre Salsa Oriented Natural Reserve"

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SUMMARY

INTRODUCTION TO THE MANAGEMENT PLAN

The Torre Salsa Oriented Natural Reserve Management Plan has been established as a technical contribution required by Agrigento Province's Participation to the Community Initiative Programme INTERREG IIIC, South, no. 3S0150R PROGRESDEC/ESDP STEPS, and namely to the funding contract for subproject OCR n° P12.IT2 "LANDSIBLE", *"Integrated Landscape Park. A Plan for an Innovative and Responsible Landscape Governance of Marginal Areas"*.

This Management Plan shall refer to a well defined area, located on the Southern side of Sicily, on the Agrigento coastline.

The importance of this area has been recognised by regional authority (Decreto Assessoriale n. 273/44 in 23/06/2000) and by EU authorities as it is part of a larger Site of Community Importance (SCI), whose Natura 2000 Code is ITA040003, called "Foce del Magazzolo, Foce del Platani, Capo Bianco, Torre Salsa" (See Annex 1A: Natura 2000 File and site maps).The Region of Sicily has in progress the update of the information relative to Natura 2000 site ITA040003 (see Annex IB).

The Management Plan has been elaborated and upgraded according to new changes and measures introduced at national and regional level for Management Plans, that is:Linee Guida per la Gestione dei Siti Natura 2000 (Official Journal no. 224 of September 24, 2002, Ministry of Environment and Territory Protection Decree of September 3, 2002);The "Manuale per la gestione dei siti Natura 2000", [Natura 2000 sites management handbook] produced during Project LIFE 99/NAT/IT/006279 "Verifica della Rete Natura 2000 In Italia e Modelli di Gestione", [Survey of Natura 2000 Network sites in Italy and Management Models] supervised by the Ministry of Environment and Territory Protection– Nature Preservation Directorate;The Management Planning Toolkit of EUROSITE (www.eurosite.org).At regional level, this document represents, in the Sicilian context, a "pilot" document that the Agrigento Provincial Administration together with planning and use of structural funds 2007-2013. This document will be submitted to all the relevant negotiation boards/discussions in order to make integrated development of natural and cultural heritage policies in accordance with the most advanced and updated international measures and instruments like the European Landscape Convention and related national and regional laws.The proposal "Piano di Gestione della Riserva Naturale Orientata di Torre Salsa" (Torre Salsa Oriented Natural Reserve Management Plan) depicts the management framework limited to the "Zona di Riserva" (Reserve Zone - zone A), which is under the control of the Agrigento Provincial Administration.

This document also outlines the management preliminary recommendations for the "Zona di Preriserva" (Pre-reserve zone, Zone B), which are included as a proposal.This Management Plan represents the right instrument for a correct, efficient and effective management of the Site, and, from a broader point of view, a true contribution from the technical and administrative point of view (considering also the experience acquired in nearly a decade of active management of this area) to reach a better definition of the national and regional management system for the Protected Areas.The Torre Salsa ONR, with all own characteristics, represents a permanent model for naturalistic, agronomic and ecologically sustainable activities to be proposed not only on regional scale but also at national and international level as part of valorisation, networking and incentive programmes.

The proposal document emphasizes the importance of the Torre Salsa ONR in a context in which the European Landscape Convention and in the practices prepared by EUROSITE the driving force for valorising so-called "marginal" areas.

1. DETAILED DESCRIPTION OF SITE FEATURES

1.1. GENERAL FEATURES AND AREA LOCATION

The Torre Salsa Reserve territory covers a surface of 761,62 hectares, is all part of the municipality of Siculiana, under Agrigento Provincial Administration, located along a coastal belt of about 6 Km on the South-western coast of Sicily, between Siculiana Marina and the Mouth of Fosso Guerra (see Annex 2A-G, Maps). The Sicilian Coast, in this area, has a NW-SE orientation.The reserve's border, starting from the South-Easternmost point, a little distance away from Siciliana Marina, is located on 37°20'32" North latitude and 0°55'39" East longitude, moves towards the central area and is also bordered by a small road in Contrada Garebici and by a path on the North-East of Monte Stella and Monte Omomorto (m 177 above sea level). The borders of this area for a short stretch remain almost parallel to S.S. Sud-occidentale Sicula n° 115 State road, that connects Trapani to Syracuse, and then it descends Westwards in a small valley to reach the border of the Montallegro Municipality. It remains close to it for a long stretch and then descends in another valley near the Monte dell'Eremita (height 160 metres above sea level.); it then moves Westwards on the Southern side of a hill, height ranging from 50 to 100 m up to "Casa Pantano", then it crosses the "Fosso Pantano" stream and goes up again on another slightly-sloped relief, moves alongside the Azienda Torre Salsa building and reaches the sea on the North westernmost edge of the reserve, 37°22'08" North latitude and 0°52'00" East longitude, basing on Monte Mario Observatory Italian Coordinates (Federico C., 2002).

The Torre Salsa natural reserve is "oriented", i.e. focused on some specific types of flora and fauna, in compliance with Sicily Regional Administration Law no. 98 of May 6, 1981. According to said Law, Regional Natural Reserves are classified as "Integral", "Special", "Genetic" and "Oriented".The Torre Salsa ONR has been set up by Sicily Regional Administration by means of Regional Minister Decree no. 273/44 if 23/06/2000.A Natural Oriented Reserve is set up for "preserving the natural environment in which some agricultural, breeding and pastoral farming activities are allowed provided they do not conflict with preservation of natural environment".

On 19.6.2000 in Palermo, during Project LIFENAT/IT/6275, a Convention was signed by Territory and Environment Regional Ministry and WWF Italia regarding the ONR "Torre Salsa" management. The ONR "Torre Salsa" is part of the Southern Area of the SCI. The Convention shall be in force for seven years.

The Convention drawn up between WWF Italy pursuant to the Regional Ministry for Environment and Territory Protection Decree of June 23, 2000, which required establishment of the Torre Salsa Natural Reserve, part of the Siculiana municipality territory, has been published in the Sicily Official Gazette of October 13, 2000. The Torre Salsa ONR is divided in two types of zones, each under a different protection regime, belonging to either category:

A Reserve (overall surface 360,41 ha);B Pre-reserve, overall surface 401,21 ha (Final report for 2006, Associazione Italiana per il WWF for Nature NGO-No profit association, Managing Body).

In 2003 an Order (23/2003) of Porto Empedocle (Agrigento Provincial Administration) Port Authority has been issued to protect all water sheets facing the reserve, thus extending protection to the sea strip that borders with the reserve.Because of its faunal relevance, in the ONR Torre Salsa area there has always been, even before the ONR was established, a wildlife shelter area ("oasis"), pursuant to art. 35 of Regional Law no. 17/1981.Use of the ONR territory is compliant to City/Rural Planning Schemes of the relevant Municipal Authorities that set the territory's intended destination of use, in

compliance with the ONR presence and the presence of the Eraclea Archaeological Site (Agrigento Cultural Heritage Stewardship).

The Agrigento Provincial Administration territory is subject to wooded areas and hydrogeological restrictions pursuant to King's Decree no 3267/1923.

The risk and unbalance maps for the Agrigento Provincial Administration territory have been drafted pursuant to Regional Ministry's Decree no. 298/41.

All information on the whole Agrigento Provincial Administration area, which comprises the ONR territory, are managed by the centralised system of the ITS (Integrated Territorial System) that operates at Provincial level. The ITS's data collection entails the following types of data: Basic maps, Territorial planning, Environment, Public Infrastructures and Social Services.

The Regulations detailing usage modalities and prohibitions in place in the Reserve has been approved by the Territory and Environment Regional Ministry in 1996.

The Torre Salsa ONR's story begins with a campaign of WWF Italia that at the end of '80 of XX century purchase an 8 hectare plot of land to create an oasis and to prevent projects on the

The site features a patchwork of dune environments within a man-made larger environment. The site, according to the Natura 2000 site management national handbook, supervised by the Environment Ministry, is classified as site featuring permanent dunes.

The critical issues of the area are related to the following:

- The fact that swimming is allowed in the area, which in turn leads to summer tourism. If tourist access is not carefully assessed and regulated, it may jeopardise the dune systemThe agricultural traditional activities in the area are essential for semi-natural context. Should these activities be discontinued, the environment would be jeopardisedUnregulated pastoral farming Poaching and heavy hunting's impact FiresPotential building speculations (rumoured building of a golf course and tourist villages).

1.2. ABIOTIC FEATURES

1.2.1. GEOLOGY AND GEOMORPHOLOGY

The lowest part of Sicily's South-Western coast's main feature is an uneven profile featuring massive peaks jutting out to sea, and between them large bays, usually of Holocene age. Here, to be more precise between Capo Bianco (a unique promontory, of unmistakably white colour, made of marls and "trubi", i.e. soft globigerina limestone), and Capo Rossello (a labyrinth of Pleistocene sea cliffs and marls) lies the Site of Community Importance "Foce del Magazzolo, Foce del Platani, Capo Bianco e Torre Salsa", ITA040003, 1567 hectares, which includes within itself the areas called Torre Salsa, Foce del Platani, Capo Bianco and Foce del Magazzolo.

The coast profile of this site is almost rectilinear and consists mainly of Holocene deposits that built deep beaches, except near the primitive promontories, partly eroded out, like the one on which Torre Salsa stands and the one opposite the Scoglio della Sirena (Siren's rock), also called "Scoglio della Secca" (Shoal's rock).

Just beyond the coast profile several different typological facies: Sea terraces slightly sloped towards the interior which then abruptly end at their external border (towards the sea) to form vertical cliffs, some of them with a remarkable aesthetic-perceptive impact; among those cliffs the streams have dug their own narrow and heavily branched beds; in the North-Eastern area there is the wide depression of the Pantano area.The shapes of reliefs, most of which are amassed near the South-Eastern border, are heavily influenced by the result of geological events and the effects of subaerial erosion. The most peculiar spots, as regards shape and geological stratification, are Monte Eremita, Sella dell'Omomorto and Monte Stella, called "monti" (mountains) for their shape even if their height is below 200 metres. Some of them, like Monte Eremita are the final result of the erosion of a previously existing tabular relief, an erosion process which is far more evident in the domelike shape of Monte Cupolone ("Cupolone" means "big dome").Other noteworthy elements are the littoral belts which are located above the current sea level, a clear legacy of the orogenetic events that took place in the area.This mosaic like landscape is due to the complex lithologic structure of the area which includes several types of deposits: Pleistocene (sands in Levantine facies in Montallegro), Pliocene (clays of the Monte Narbone formation, globigerina soft limestones– "trubi"), Messinian (rough sands, Arenazzolo deposits, first and second cycle gypsum from the Higher Messinian age, sand-gypsum, white marls of the Lower Messinian), Serravallian and Tortonian deposits (clays). Obviously, orogenetic movements have shaped and altered the original disposition of these deposits, sometimes even swapping or reversing their stratigraphic order, and then subaerial and sea erosion (in the areas exposed to air and sea respectively) added further changes to the morphologic layout, which is indeed far from being final.The subaerial and sea erosion produced the most peculiar shapes in this area. For example, wherever the reliefs which emerged are composed of gypsum and "trubi", the reliefs are rather harsh and edged. On the other hand, gypsum in terraces produced karstic phenomena (dolines). The water bodies that run through sedimentary evaporitic deposits, formed endoreic basins, i.e. basins that do not reach the sea.

The cove slopes instead concern primarily the open-air clay deposits, while the coastal surfacing deposits made of trubi create deeply depressed escarpments. The latter deposits, near the tide line, contributed significantly to physical protection of the rocks behind them by stopping erosive pressure of the surge in addition to forming unique semi-submerged cliffs on the upper intra-coastal area that still survive today. The massive tectonic slope of Monte Stella has unique stratigraphic features and part of it has suffered from significant collapses.The coastal belts that lack erosion-resistant deposits instead suffer from the sea's erosive force, creating wide bays; they are also subject to significant

retrogradation clearly highlighted by map comparisons. In some cases the amount of such retrogradation has exceeded one hundred meters in the last forty years.Lastly, the whole area stands out for its significant geological fragility which is even more evident on the coastal border. It is therefore necessary to immediately enact vegetational protection measures for the over-coastal belt and the structural belt of the upper external borders of the marine terraces as well as for the waterbeds in the unique Pantano area

1.2.2. GEOPEDOLOGY

The area features a very complex geological structure, consisting of a mosaic of geological formations which are rather typical of Central-Southern Sicily (Sortino S., 2002). First of all there are the Holocene formations, consisting of current and recent floods in the valley line, often terraced (with more than one layer) with coastal sands, then there are also the marine terraces and the Pleistocene formation in Montallegro. The latter consists of yellow Aeolian sands and lagoonar sandy clays with gypsum lenses.The area features Pliocene "Trubi" (globigerina marls and calcareous marls) which are intercalated with or towered above by clayey breaks. Other four Miocene formations complete the geological landscape of the Torre Salsa ONR: The Arenazzolo formation, consisting of silt-micaceous clays, intercalated with Pasquasia Gypsum placed in small layers alternating with large crystals and saccharoids. The Pasquasia Gypsums are followed by Cattolica Eraclea Gypsums that are the most widespread. The geological landscape is completed by the Complesso Argilloso, a chiefly clayey complex with undefined Miocene age marly and clayey edges together with stony blocks.

The following table describes the presence (percentage) of these formations (Sortino S., 2002):

Geological Formations	%
Cattolica Gypsums	31,60
Complesso Argilloso (clayey complex) with marly edges	18,44
Marine Terraces	16.58
Alluvial deposits	9,64
Formazione Montallegro sands and sandy clays	8,40
Arenazzolo	7,61
Dunes	3,18
Trubi	2,73
Pasquasia Gypsums	1,82
Total	100

The above geological features correspond to the following soil types (Ferretti et al, 1988; Sortino S., 2002):Dune land typic Xeropsammaquents (% = 38,39)Typic Psammaquents (% = 28,97)Typic Xerorthents (% = 26,59)Typic Xerorthens-Lithic Xerorthents (% = 2,98)Calcixerollic Xerochrepts (% = 3,07)

1.2.3. HYDROGEOLOGY, HYDROGRAPHY AND HYDROLOGY

Analysis of the hydrographic network (Galia F., 2002) shows that precipitation waters are collected by a complex hydrographic drainage system: First they flow away by means of a network of long and short trickles, then they gather into increasingly large water bodies.

The trickle network's features change according to the type of lands it moves on. The trickles that run over gypseous reliefs are rather different from those that run over clayey ones due to different size of the carvings as well as the depth, breadth and slope of their beds. On sandy soils, the trickle network is not very important due to the high permeability of the substrata of sandy origin, whose

surface efflux is almost non-existent.The gypseous massifs' surfaces are crossed by a recently-formed hydrographical network. Erosions have caused in these reliefs have produced narrow and deep impluviums, with steep slopes. Quite often the gypseous relief collect waters in basins with limited tendency to water efflux, since they are often closed or depressed. This hydrogeological situation often leads to pseudokarstic phenomena in which all or part of the waters drained in the basin. Massive cracking in karstic rocks allows water to easily percolate inside the massifs and subsequently feed the underground hydrographical system.Both main water bodies and minor ones have quick and abundant spates but also long-lasting ebbs. Rain is frequent and massive in autumn and winter while in spring and summer it is negligible.The territory's hydrographical system has a mainly seasonal nature and a torrential regime. It is quite complex since each single stream that makes it up drains very large surfaces. Corrivation times of pluvial waters are quite short due to lack of tree cover and presence of clayey (that is, non-permeable) lands. The lots above the sea cliffs often contain small trickles.Surface hydrology consists of three hydrographical systems:Fosso del Pantano basin (in which waters are poured out by means of the Salso mouth)Fosso dell'Eremita basinSella Omomorto basin.The Fosso del Pantano originates on the Northern slope of Monte Sedita in Montallegro; its bed covers a 6 Km track, along which several tributaries pour their waters in the bed.In the tributary's watersmeet point, in the Zotta d'Aquila hamlet the Fosso splits in two branches. One moves towards the depression in the valley, the other generates a pseudokarstic phenomenon with the waters diving into a small sized swallow-hole whose first part is practicable. The impluvium line is rather twisty and it crosses the Pantano prior to reaching the sea through the Salso mouth. This is a morphologically depressed area (with respect to the sea level) that remains humid all the year long.The Fosso dell'Eremita originates in Contrada Pileri, in the Montallegro countryside, runs through it for about 2 Km and features a 75 hectares basin. It then worms into a narrow valley in the Siciliana area with averagely steep slopes.The Fosso dell'Omomorto originates in the Sella dell'Omomorto, located in the Northern side and, after about 1,5 Km (half of which with very steep slopes) dives into the sea South-East of Casa Cannicella.

1.2.4. CLIMATE

Recently, Sortino S. (2001), employing some thermo-pluviometric data obtained from the Agrigento weather station, has processed and used the following bioclimatic indexes:

- Lang's Rain Factor, below 40, means that the Torre Salsa ORN's climate is of the type dry/hot;
- De Martonne's aridity index, is 24.9 which clearly highlights the territory's low potential to maintain a forest vegetable cover: the area's vegetable cover features maquis spots;
- Emberger's pluviometric quotient, whose value (96.9) classifies Torre Salsa's ORN as a Mediterranean temperate plain.

The values of these indexes, integrated with the Bagnouls and Gaussen's diagrams and the anemometric values point out that the most potentially suitable types of vegetation for Torre Salsa's ecologic environment are those of Low Maquis (Sortino S., 2002).

This fact is confirmed by the result of the climatic-biological studies that collocate the Torre Salsa's area in the dry-Mediterranean environment whose typical type of vegetation is the evergreen low bush with dwarf palm or to the lower infra-Mediterranean thermotype and the upper dry ombrotype (Sortino S., 2002).

A series of analyses (Federico C., 2002) covering a period of 15 years, from 1982 to 1996, the average monthly temperatures in January range from 10°C to 14°C and only once, in January 1985, average monthly temperature dropped to 4.8°, while August's monthly averages range from 21.8°C to 29°C with maximum peaks of 40°C.

Difference between day and night average monthly temperature is about 6°C in coldest months and 10.3°C in the hottest ones.

1.2.4.1. AVERAGE GROUND SLOPE

In some recent studies (Sortino S., 2002), ground slope of this area has been sorted into six classes and correlated with potential land use. The result was that about 40% of the territory belongs to classes D, E and F which means extremely limited use with soil preservation issues or total preservation. Only 51.6% allows use ranging from intensive to semi-intensive.

Steepness class	Slope %	Description	% of land
A	0-5	Flat areas: intensive use	22.9
B	5-10	Low steepness area: semi-intensive use	28.7
C	10-15	Average steepness areas: limited use	8.4
D	15-25	Average-high steepness areas: limited use and soil preservation problems	18.2
E	25-35	High steepness areas: limited use, waters optimisation and pre-emptive evaluation of site compatibility with intended usage required	10.4
F	>35	Very high steepness areas: total soil preservation (no use)	11.4

1.3. BIOTIC FEATURES

1.3.1. FLORA

Description is chiefly based on data published by Agrigento Provincial Administration and especially on data excellently described in:

- Sortino S., 2002. La valutazione multi-dimensionale nella programmazione di attività agricole compatibili con la protezione dell'ambiente: il caso delle Riserva di Torre Salsa. Università degli Studi di Palermo, Degree Thesis, Architecture Faculty, Academic Year 1995/1996 (Supervisor: Prof. Francesco Maria Raimondo) printing supervised by Agrigento Provincial Administration – Territory and Environment Regional Ministry.
- Federico C., 2002). La flora della Riserva Naturale di Torre Salsa (AG) (ed. Francesco Galia) (WWF Italia – Sicily Regional Administration).

It is evident that further field researches, focusing on more than one vegetation season are not only wanted for, thanks to the involvement of scientific university departments, but indeed required and called for by the Management Plan's own feasibility and applicability.

The results achieved so far, especially by Sortino S., have made it possible to understand some flora indexes suitable to provide significant indications on environment status (and which, as such, constitute useful management benchmarks) in all facets of ecological balance.

According to literature data (which needs further and more thorough inquiry) in order to understand any and all processes under development in the area (for example ingression and/or disappearance and/or thinning out), the complete taxonomy includes 536 species.

This figure is important if compared to the size of Torre Salsa ORN and has an ecological value which assigns indigenous flora a percentage of 70.5 compared to 6.5% of forest species, 22.9% of agrarian species and 0.1% of exotic ones. The relationship between indigenous flora and others is 87.9% to 12.1% .

Chorologic value has a value of about 80%, calculated from the following values (for vascular flora):

CHOROLOGICAL VALUE	NUMBER OF SPECIES	%
Endemic	4	0.7
Sub-endemic	1	0.2
Euro-Mediterranean	98	8.1
Steno-Mediterranean	199	7.1
Mediterranean	102	9
European	10	0.9
Cosmopolitan	66	2.3

(source: Sortino S., 2002)

A special naturalistic value has to be attributed to the presence of sub-endemic *Matthiola fruticulosa* (L.) Maire and endemic *Dianthus siculus* Presl., *Ammi crinitum* Guss., *Scabiosa dicotoma* Ucria and *Micromeria canescens* (Guss.) Bentam, all found in the garigues that dominate the gypsums in the inland areas. It also bears mentioning (for its rarity) *Lavatera agrigentina* Tineo whose specific habitat are the clayey ravines.

Some species have a particular phytogeographic relevance, namely *Juniperus turbinata* Guss. subsp. *turbinata* which once constituted the maquis of the retrodune environment (which now has been reforested) of which a small number of specimens survive in the shelter areas; *Crucianella marittima* L., quite common on dune environments; *Gypsophila arrostii* Guss. found in the gypseous environments that here marks the western boundaries of its distributional area.

From literature (Sortino M, 1967; 1969; Sortino S., 2002) it is possible to understand that the biological spectrum whose percentage distribution has been listed above features an array of biological forms that is in tune with the peculiarities of the vegetal landscape of the coastal belt where Torre Salsa ORN's area is located.

Edaphoclimatic parameters, especially dryness of the substrata and exposure to salty winds are testified by the high percentage of terophytes, about 50%, while the percentage of hemicryptophytes (21.6%) is related to the beaches environment.

BIOLOGICAL FORMS	NUMBER OF SPECIES	PERCENTAGE
P (Phanerophyte)	29	5.4
NP (Nanophanerophyte)	25	4.7
Ch (Chamerophyte)	31	5.8
H (Hemicryptophyte)	116	21.6
T (Terophyte)	264	49.2
He (Halophyte)	1	0.2
G (Geophyte)	68	12.7
I (Hydrophyte)	2	0.4

(Da: Sortino S., 2002)

The full list of existing species is very long, for further and detailed information please refer to specialised works (Sortino S., 2002; Federico C., 2002) and to the bibliography.

1.3.2. VEGETATION

1.3.2.1. POTENTIAL NATURAL VEGETATION

Potential natural vegetation of the Central-Southern Coast of Sicily can be ascribed chiefly to *Oleo-Ceratonium*. This vegetal formation is found at heights from 0 to 200 m above sea level, chiefly on the Western, Southern and Eastern sides of Sicily.

Torre Salsa ORN's orography, topographic position and in particular the nature of the lands produce values that differ from the land's primary vocation, generating a series of different environments from the sea to the interior. These environments are able to express vegetable populations that are related to the dynamic series of alliances *Ammophilion, Euphorbion peplis, Phragmition* and *Oleo-Ceratonion*, thus distributed:

- Dune formations (to reconstruct vegetation that populated this part of the beach in the past we have used the synthesis drafted by Sortino S., 2002). The phyto-ecological potential after the anthropic impact has ceased can express the full range of associations belonging to *Euphorbio-Ammophiletea arundinaceae* and *Helicrhryso-Crucianelletea maritimae*.
- Adlittoral plane. The vegetal cover, due to the lands' marginal nature, runs the gamut of a mosaic of aspects from the grassland populated by *Lygeum spartum* L. and the low maquis belonging to *Suaedo fruticosae-Salsoletum oppositifoliae.*
- Plateaus and slopes in the interior. The potential vegetation on deep and less steep lands should produce an *Oleo-Ceratonion* related maquis, enriched by elements member of *Euphorbietum dendroidis* on the gypsums. In more marginal and drier environments there is a paraclimax with *Hyparrhenia hirta (Hyparrhenietum hirto pubescensis)* and the garigue with a *Coridothymus capitatus (Coridothymetum capitati).*

1.3.2.2. ACTUAL NATURAL VEGETATION

Psammophylous vegetation features typical seriation of the Southern Sicily beach, constituted by *Salsalo kali-Cakiletum maritimae, Sporolobo arenarii-Agropyretum junceum* and *Echinophoro spinosae-Ammophiletum arenariae.* Among typically dunal vegetal species it is worth mentioning *Cakile maritima, Euphorbia paralias, Pancratium maritimum, Crucianella maritima.*

The retrodune vegetation population is related to *Centaureo-Ononidetum ramosissimae (Crucianellion maritimae)* which have reappeared after having been partially reduced by *Acacia cyanophylla, Pinus halepensisi, Mioporus insularis* and *Eucalyptus camaldulensis* reforestation measures.

Precious but, alas, extremely scarce in terms of covered surface is relict vegetation of the original coastal maquis, whose most important species is *Juniperus phoenicia* which populates noticeable spots in some marginal areas not reached by crops.

Towards the interior there are some vegetation spots populated by *Juniperus turbinata* subsp. *turbinata*, remains of a formerly large maquis which was rather widespread especially in the subcoastal belt of Southern Sicily. In some retrodunal sites with periodically submerged halomorphous lands some spots of *Juncetea maritimi* and *Sarcocornietea fruticosae* have been identified (Sortino S., 2002).

The depressions subject to swamping, with permanent stagnation often host large spots populated by *Phragmites australis (Phragmitetum communis)* while the margins often host a hygrophylous brush of *Tamericetum gallicae.*

Swamp vegetation with *Phragmites australis* and *Typha latifolia, Cirsium creticum, Arthrocnemum fruticosum* and *Halimonie portulacoides* is found in the Pantano depression, with *Tamaricetum* on the borders. Swamp vegetation's preservation status is critical.

Vegetation in the plateaus is a function of the pedolithological features of the substrata: the ravinelike scarps feature halonitrophilous vegetation with *Salsola verticillata (Suaedo-Salsoletum appositifoliae)*, while the gypseous-marly substrata, with rocks protruding upwards, feature different examples of maquis with *Euphorbia dendroides (Oleo-Euphorbietum dendrodes phlomidetosum fruticosae)*, garigues with *Coridothymus capitatus (Rosmarino-Thymetum capitati)* and grasslands with *Hyparrhenia hirta (Hyparrhenietum hirto-pubescentis).*

Among the most interesting species in these series there are *Lygeum spartum, Narcisus serotinus, Glycirrhiza glabra,* several *Orchis (collina, italica, lactea, oxyrrynchos, papillonacea, peculum)* and an endemic hollyhock, *Lavatera agrigentina.*

Wherever the soil is thick enough, land hosts a wide array of cultivation and farming uses. In this context, potentially related to *Oleo-Ceratonion* formations there are some elements of ruderal and synanthropic vegetation chiefly belonging to classes *Stellarietea mediae and Secaletea*.

It follows that vegetation types detected in the Torre Salsa area is representative of the edaphoclimatic potential of the Southern coast of Sicily, except for reforested areas. The significant amount of biotopes, in spite of the area's limited size, brings to light a wide variety of environments (beaches, ravines, trubi, gypsums, streams and marshes) which, should the anthropic disturbance cease, would generate a ecotonal continuum. Moreover, this environmental variety, despite anthropic effects, bestows upon Torre Salsa's vegetal resources an efficient "Homeostatic Plateau (Sortino S., 2002).

1.3.2.3. AGRICULTURAL-FOREST VEGETATION

The Land Usage Map for Torre Salsa area and nearby areas (amounting to about 2540 hectares) shows that pastureland, reforestation areas and non-productive non-cultivated land lots cover about 45% of the surface while the part suitable for cultivation (about 50% of the whole surface) is almost equally divided among vineyards (22.7%) and lots ready for sowing (20%).

LAND USAGE	HECTARES	PERCENTAGE
Pastureland	841	33.1
Vineyards	577	22.7
Sowing land	509	20.0
Tree farming	168	6.6
Woods	154	6.1
Productive non-cultivated	141	5.6
Non-productive non-cultivated	128	5.0
Orchards	22	0.9
Total	**2540**	**100**

1.3.3. HABITATS

Within Torre Salsa ORN the following Habitats of community importance have been identified and reported:

*	HABITATS DIRECTIVE CODE	CORINE CODE	NAME
*	2270	16.29x42.8	Dunes with *Pinus pinea* and/or *Pinus pinaster* woods
	2120	16.212	Mobile dunes of the sandbank with *Ammophila arenaria* (white dunes)
*	6220	34.5	Sub-steppe paths with graminaceous plants and therophytes (*Thero-Brachypodietea*)
	5330	32.22-32.26	Low euphorbia formations
	2195 (2190?)	16.31-16.35	Humid depressions in the dune system
	2110	16.211	Embryonic mobile dunes

*** :** Priority Habitat according to the Habitats Directives
Name : Name of the type of habitat as defined in the Habitats Directive.

2270 *Dunes with Pinus pinea and/or Pinus pinaster* woods

This habitat consists of coastal dunes with Mediterranean thermophilic pinewoods. These are natural formations more or less helped by human intervention to replace small bushes or sclerophyllous plants woods.

2120 Mobile dunes of the sandbank with *Ammophila arenaria* (white dunes)

This habitat consists of mobile dunes that form the dune bank overlooking the coast or the banks in the coasts' dune systems. The typical associated vegetation is *Ammophilion arenariae.*

Other vegetal species in the Torre Salsa ORN reserve, listed in the Habitats Interpretation Manual that can be traced back to this association are *Ammophila areanaria, Eryngium maritimum, Euphorbia paralias, Calystegia soldanella (non indicata), Echinophora spinosa, Cutandia maritima, Medicago marina, Cyperus capitatus, Oninis natrix subsp. ramosissima, Polygonum maritimum.*

6220 Sub-steppe paths with graminaceous plants and therophytes (*Thero-Brachypodietea*)

Xerophyle annual grasslands, rich with therophyte communities featuring typical habitats of Southern Italy and islands (*Thero-Brachypodietea, Poetea bulbosae, Lygeo-Stipetea)*. The species that can be traced back to this association in the Torre Salsa ORN are *Stipa capensis, Stipa ritorta, Stipa tortilis, Scorpiurus muricatus, Coronilla scorpioides, Trifolium campestre, Reichardia picroides, Linum strictum.*

5330 Low euphorbia formations

This habitat is typical of thermo-Mediterranean zones. It includes vegetal formations mostly indifferent to the nature of the substrate (siliceous or calcareous) that reach their maximum extension in

thermo-Mediterranean regions. Vegetal species typical of this habitat found in the Torre Salsa ORN and also listed in the Habitats Interpretation Manual are *Euphorbia dendroides, Ampelodesmos mauritanica, Chamaerops humilis.*

2195 (2190?) Humid depressions in the dune system

This habitat is generated by humid depressions in the dune systems. This habitat is extremely rich and specialised and also seriously endangered by the lowering of aquifers. Vegetal species typical of this habitat found in the Torre Salsa ORN and also listed in the Habitats Interpretation Manual can be traced back to the following associations Juncenion (*Juncus acutus, J. a. subsp megalocarpus, J. compressus, J. effusus, J. fontanesii) and* Gentiano-Erythraeetum littoralis *(Erithraea pulchella, E. ramosissima, E. spicata).*

2110 Embryonic mobile dunes

This habitat of community importance is formed by the coastal formations that represent the first stage of dune formation, consisting of sandy surfaces on the beach or heaps of sands stocking up at the feet of the permanent dunes. Vegetal species typical of this habitat found in the Torre Salsa ORN are *Agropyron junceum subsp mediterraneum, Sporobolus pungens, Euphorbia peplis, Otanthus maritimus, Medicago marina, Eryngium maritimum, Pancratium maritimum*. All of these species define the habitat of community interest and are described in the Habitats Interpretation Manual except for the subspecies *A. j. mediterraneum.*

1.3.3.1. HABITATS IN THE SITE OF COMMUNITY IMPORTANCE

Access to the Natura 2000 File ITA 040003 (see Annex 1A) has made it possible to systematise the information and identify the habitats according to the Habitats Interpretation Manual. The Region of Sicily has displayed the updating of the Natura 2000 File (see Annex 1B).

In the Site of Community Importance area the following six habitats of community importance (Annex I to Habitats Directive) have been identified and reported according to the Natura 2000 File and the Ministry of Environment Database:

Priority Habitat	%C	Habitats Directive Code	Corine Code	Name
*	30	2270	16.29x42.8	Dunes with *Pinus pinea* and/or *Pinus pinaster* woods
	30	2120	16.212	Mobile dunes of the sandbank with *Ammophila arenaria* (white dunes)
*	10	6220	34.5	Sub-steppe paths with graminaceous plants and therophytes (*Thero-Brachypodietea*)
	10	5330	32.22-32.26	Low euphorbia formations
	10	2195 (2190?)	16.31-16.35	Humid depressions in the dune system
	10	2110	16.211	Embryonic mobile dunes

* :Priority Habitat according to the *Habitats Directive* **%C**: Coverage percentage. **Corine Code**:*Corine* Code **Code** :Code used in the *Habitats Directive*. **Name** :Habitat type name according to the *Habitats Directive*.

1.3.3.2. SITE VALUE IN THE NATURA 2000 NETWORK

The Site of Community Importance of Natura 2000 network called "Foce del Magazzolo, Foce del Platani, Capo Bianco e Torre Salsa" is part of an extremely important landscape and naturalistic context as it engulfs one of the few areas in the Agrigento coast that so far has remained untouched.

From the representativeness point of view, the habitats located within the borders of the SCI "Foce del Magazzolo, Foce del Platani, Capo Bianco e Torre Salsa" show the following features (as stated in the Natura 2000 File):

Habitat	Coverage (%) and relative surface	Representativeness	Relative surface	Preservation status	Overall evaluation
2270	30% (470 ha)	C	C	C	C
2120	30% (470 ha)	C	C	C	C
6220	10% (157 ha)	C	C	C	C
5330	10% (157 ha)	C	C	C	C
2195	10% (157 ha)	C	C	C	C
2110	10% (157 ha)	C	C	C	C

The letters used in the table follow the recommendations of the Natura 2000 Files reading and writing guide, as follows:

REPRESENTATIVENESS = level of representativeness of the relevant habitat on the site. The Natura 2000 Form criteria have been used to define representativeness:

A: excellent representativeness
B: good representativeness
C: significant (adequate) representativeness

RELATIVE SURFACE = surface site covered by the relevant habitat with respect to overall surface covered by the same habitat in the Italian territory. The Natura 2000 Form criteria have been used to define relative surface:

A: 100 > = p > 15%
B: 15 > = p > 2%
C: 2 > = p > 0%

PRESERVATION STATUS = Preservation conditions of the structure and functions of the relevant type of natural habitat as well as possibility to restore it.

A: excellent preservation
B: good preservation
C: average or limited preservation

OVERALL EVALUATION = Overall evaluation of the relevant habitat's preservation and protection on the site.

A: excellent B: good C: significant

These recommendations prompt the need to adequately manage the SCI as a whole and the Torre Salsa ORN in particular for the purpose of protecting the natural habitats located within them.

According to Ministry of Environment's document "Manuale per la gestione dei siti Natura 2000" [Natura 2000 sites management handbook], produced during Project LIFE 99/NAT/IT/006279 "Verifica della Rete Natura 2000 In Italia e Modelli di Gestione" [Survey of Natura 2000 Network sites in Italy and Management Models] the SCI "Foce del Magazzolo, Foce del Platani, Capo Bianco e Torre Salsa" belongs to the category of sites featuring permanent dunes.

The reason for that is due to the fact that priority habitat 2270 "*Dunes with Pinus pinea and/or Pinus pinaster* woods" covers the largest surface (30%), in the priority habitat.

In addition to that, presence of other habitats like 2190 – Humid depressions in the dune system, 2120 – Mobile dunes of the sandbank with *Ammophila arenaria* (white dunes) and 2110 – Embryonic mobile dunes also supports classification of the site "Foce del Magazzolo, Foce del Platani, Capo Bianco e Torre Salsa" to the "permanent dunes" site type.

From the management point of view, the dunes with *Pinus pinea and/or Pinus pinaster* woods are threatened by the intrusion of the saline wedge and by the dwindling of the dune relicts that protect them from sea ingression. In order to preserve this habitat it is necessary to keep a balance between fresh and salt water levels.

1.3.4. FAUNA

As for the flora, the need to make further field studies that take into account more breeding seasons and the biological and ecological cycles of the species, is not only desirable thanks to the involvement of the university scientific divisions, but also suggested by the feasibility and applicability of the managing plan.

The limited, and mainly amateur, knowledge on fauna is a serious obstacle to the implementation of a preservation plan for the medium to long-term.

To fill this gap by studying in depth, inside the reserve and in the adjacent areas, the knowledge on the ecology and biologic needs of the species that actually live in the reserve, is the first necessary step towards the preservation of its fauna heritage.

To fill this gap the architect Franco Galia, director of Natural reserve (until his recent death) promoted an agreement between the managing organisation, WWF Italia and the *Dipartimento di Biologia Animale* -animal biology division- of the *Università di Palermo*, whose purpose is to make known the typical vertebrate fauna that characterize the protected area. The research is under way and will be finished by December 2007.

From the first results it is seems clear that there are different fauna peculiarities, some of which are taken into consideration by the present plan and will surely be worth special attention at the end of the research.

The territorial planning actions elaborated up to this moment will be dealt with in detail later. They are a first list of interventions that will be completed with the further actions that will emerge at the end of the research on the use of species space and biology, taking into account that the purpose of natural reserves is the preservation of biodiversity.

The most interesting zoocoenosis is that regarding the swamp as well as that of the areas adjacent the dunal and retro-dunal areas.

The Mammals

The number of mammals has been drastically reduced by human intervention (hunting, fishing, farming and pastoral activities), among the mammals of the area these should be remembered: The porcupine (*Hystrix cristata)* -a species protected by national laws and Community Directives-; the wild rabbit *(Oryctolagus cuniculus);* the weals (*Mustela nivalis boccamela*); the hedgehog (*Erinaceus europaeus*); the fox (*Vulpes vulpes*).

The presence of the wild rabbit is an elective trophic factor for the Bonelli's Eagle (*Hieraaetus fasciatus*), one of the most threatened European predatory species that, if still not present in the territory of the Torre Salsa ONR, has been seen nesting in the vicinity. This situation underlines the need for a numeric and sanitary control (mixomatosis and haemorrhagic hepatitis) on the population of this leporidae (Lo Valvo M., *personal note*). The presence of ill wild rabbits emerges from the preliminary studies carried out by Professor LoValvo M. of the Dipartimento di Biologia Animale of the *Università di Palermo.*

Among the chiropterans reports mentioned the presence of three species: two rhinolophus (*R. hipposideros* and a *R. ferrumequinum)* and the mouse-eared bat (*Myotis myotis*) (Galia F., *personal note*).

SPECIES	SCIENTIFIC NAME	PRESENCE	CONSERVATION STATUS
Lesser Horseshoe Bat	*Rhinolophus hipposideros*	Present	Threatened
Greater Horseshoe Bat	*R. ferrumequinum*	Present	Vulnerable
Mouse-Eared Bat	*Myotis myotis*	Present	Vulnerable
Hedgehog	*Erinaceous europaeus*	Present	Common
Etruscan Shrew	*Suncus etruscus*	Not verified	Common
Sicilian Shrew	*Crocidura sicula*	Not verified	Vulnerable
Wild Rabbit	*Oryctolagus cuniculus*	Present	Vulnerable
European Hare	*Lepus europaeus*	Present	In great danger
Savi's Pine Vole	*Microtus savii*	Not verified	Common
Wood Mouse	*Apodemus sylvaticus*	Not verified	Common
Norway Rat	*Rattus norvegicus*	Not verified	Common
Black Rat	*Rattus rattus*	Not verified	Common
Common Mouse	*Mus domesticus*	Present	Common
Porcupine	*Hystrix cristata*	Present	Vulnerable
Fox	*Vulpes vulpes*	Present	Vulnerable
Weals	*Mustela nivalis*	Present	Vulnerable

Table 1.3.1. List of mammals present (or not verified) in the Torre Salsa ONR (modified by: Galia F., 2002)

Birds

The species of birds that nest in the area are about thirty (Galia F., 2002). The most interesting ones are the Reed Warbler (*Acrocephalus scirpacens*), a trans-Saharan migratory species now confined to those few humid environments with thick riparian vegetation; the Nightingale (*Luscinia megarhynchos*) and the Cetti's Warbler (*Cettia cetti*).

Among the nest predators, no-nocturnal and nocturnal, the reported ones are the Peregrine Falcon (*Falco peregrinus*); the Kestrel (*Falco tinnunculus*); the Buzzard (*Buteo buteo*); the Little Owl (*Athene noctua*) and the Scops Owl (*Otus scops*). The Bonelli's Eagle (*Hieraaetus fasciatus*) is one of the most threatened European predatory species that, if still not present in the territory of the Torre Salsa ONR, has been seen nesting in the vicinity.

The avifauna, both resident and migrant, is more considerable, in particular: *Larus michahellis* (Yellow-legged gull); **Larus audouinii* (Audouin's gull, priority species as referred to in Directive EEC "Birds"); *Gelochelidon nilotica* (Gull-billed Tern); *Actitis hypoleucos* (Common sandpiper); *Tringa totanus* (Redshank), *Limosa limosa* (Blacktailed Godwit); *Himantopus himantopus* (Black-winged Stilt); *Recurvirostra avosetta* (Avocet), *Grus grus* (Crane); **Falco eleonorae* (Eleonora's Falcon, another priority species as referred to in the Directive "Birds"); *Pandion haliaetus* (Osprey); *Circus aeruginosus* (Marsh Harrier); *Circaetus gallicus* (Short-toed Eagle); *Milvus migrans* (Black Kite); *Pernis apivorus* (Honey buzzard); *Anas platyrhynchos* (Mallard); *Tadorna tadorna* (Shelduck); *Plegadis falcinellus* (Glossy Ibis); *Ciconia ciconia* (Stork); *Merops apiaster* (bee-eater); *Coracias garrulus* (Roller).

When the lake is full of water, some species of ducks stop there, most of all Pochards (*Aythia ferina*) than can spend the whole winter there. In the low cliffs, where the fish fauna is very abundant,

many Ardeidae stop there, among which the Grey Heron *(Ardea cinerea)*; the Purple Heron (*Ardea purpurea*); the Common Spoonbill (*Platalea leurorodia*) and the Little Egret (*Egretta garzetta*). On the beach, during the migrations, it is possible to see many waders, among which the Common Sandpiper (*Actitis hypoleucos*).

A recent avifauna checklist shows the presence of 115 species in the Torre Salsa ONR, most of which are migrant (Galia F., 2002).

Nevertheless, also in this case there are no up-to-date data regarding the exact ecology of the species, for this reason a more deep study is desirable to check the composition of the species both nesting and spending the winter.

Species	Scientific name	Conservation status
Moorhen	*Gallinula chloropus*	Common
Peregrine Falcon	*Peregrine Falcon*	Vulnerable
Kestrel	*Falco tinnunculus*	Common
Buzzard	*Buteo buteo*	Vulnerable
Little Owl	*Athene noctua*	Common
Scops Owl	*Otus scops*	Common
Wren	*Troglodytes troglodytes*	Common
Whinchat	*Saxicola rubetra*	Common
Blue Rock Thrush	*Monticola solitarius*	Common
Thekla Lark	*Galerida cristata*	Common
Blackbird	*Turdus merula*	Common
Nightingale	*Luscinia megarhynchos*	Common
Cetti's Warbler	*Cettia cetti*	Common
Fan-tailed Warbler	*Cisticola juncidis*	Common
Reed Warbler	*Acrocephalus scirpaceus*	Common
Sardinian Warbler	*Sylvia melanocephala*	Common
Blue Tit	*Parus caerulus*	Common
Great Tit	*Parus major*	Common
Short-toed Treecreeper	*Certhia brachydactyla*	Common
Tilting Train	*Remiz pendulinus*	Common
Jay	*Garrulus glandarius*	Common
Magpie	*Pica pica*	Common
Jackdaw	*Corvus monedula*	Common
Raven	*Corvus corax*	Lowest threat
Spanish Sparrow	*Passer hispaniolensis*	Common
Serin	*Serinus serinus*	Common
Goldfinch	*Carduelis carduelis*	Common
Twite	*Carduelis cannabina*	Common
Cirl Bunting	*Emberiza cirlus*	Common
Corn Bunting	*Miliaria calandra*	Common

Table 1.3.2. List of the bird species nesting in the Torre Salsa ONR (modified by: Galia F., 2002)

Reptiles

Among the reptiles to be noted the presence of the *Emys trinacris*, endemic species recently identificated. The species has been studied during a research commissioned by the WWF Italia and conduced by the Professor Mario Lo Valvo (Dipartimento di Biologia Animale dell'Università di Palermo). The preliminary results focus on the conservation status of the species *in situ.*

On the coastline it is still remarkable, also if rare, the presence of the sea turtle *Caretta caretta** for mating purposes.

Species	Scientific name	Presence	Conservation status
Sicilian pond turtle	*Emys trinacris*	Present	Vulnerable
Sea turtle	*Caretta caretta*	Present	In great danger
Mediterranean Gecko	*Hemidactylus turcicus*	Present	Common
Gecko	*Tarantola mauritanica*	Present	Common
Green Lizard	*Lacerta viridis*	Present	Common
Italian wall lizard	*Podarcis sicula*	Present	Common
Sicilian wall lizard	*Podarcis wagleriana*	Not verified	Common
Ocellated Skink	*Chalcides ocellatus*	Not verified	Common
Aesculapian Snake	*Elaphe longissima*	Not verified	Common
Western wip snake	*Coluber viridiflavus*	Present	Common
Ringed Snake	*Natrix natrix*	Present	Common
Aspic Viper	*Viper aspis*	Not verified	Common

Table 1.3.1. List of reptiles present (or not verified) in the Torre Salsa ONR (modified by: Galia F., 2002)

Amphibians

In the reserve area there are four species of amphibians: the common toad (*Bufo bufo*), the painted frog (*Discoglossus pictus*), the European green toad (*Bufo viridis*) and the water frog (Rana spp). It should be interesting to evaluate the exact taxonomic collocation of the latter species (Lo Valvo F & Longo A.M., 2001). It is interesting underline that 50% of the "new amphibian species" that is the European green toad and the painted frog have been found only recently (Lo Valvo M., personal note).

Invertebrates

Among the less frequent coastal fauna it is to be noted the *Cicindela trisignata (*var. *siciliana)* beetle, the *Pimelia bipunctata* and the local beetle *Polyphilla ragusai*. Among the lepidopterists there is the Spurge Hawk-moth (*Hyles euphorbiae*).

A specific research of the entomological fauna of the Torre Salsa ONR area is recommended.

1.3.5. FISHERIES RESOURCES

As far as the sea fauna is concerned, near the coast there is a predominance of the sandy sub littoral species and of the posidonia area, while in the higher part of the sub littoral and in the intertidal area there are characterized by the intertidal fauna.

Bone fish	***Mollusca***	***Crustacea***
Conger conger (L.)	*Acanthocardia tubercolata (L)*	*Squilla mantis (L.)*
Phycis phycis (L)	*Donax trunculus (L.)*	*Penaeus kerathurus (Forskal)*
Triopterus minutus capelanus (Lacepéde)	*Mylitus galloprovincialis (Lamarck)*	*Hommarius gammarus (L.)*
Aphia minuta mediterranea (De Buen)	*Ostrea edulis (L.)*	*Palinurus elephas (Fabricius)*
Gobius niger jozo (L.)	*Pecten jacobaeus (L.)*	*Nephrops norvegicus (L.)*
Coris julis (L.)	*Ensis minor (Chenu)*	*Palinurus elephans (Fabricius)*
Labrus bimaculatus (L.)	*Callista chione (L.)*	*Scyllarides latus (Latreille)*
Labrus viridis (L.)	*Chamalea gallina (L.)*	*S. arctus (L.)*
Symphodus tinca (L.)	*Venus verrucosa (L.)*	*Maja squinado (Herbst)*
Kyrichthys novacula (L.)	*Aporrhais pespelecani (L.)*	
Lophius piscatorius (L.)	*Nassarius mutabilis (L.)*	
L. budegassa (Spinola)	*Sepia elegans (Blainville)*	
Merluccius merluccius (L.)	*Sepia officinalis (L.)*	
Dicentrarchus labrax (L.)	*Sepietta oweniana (Orbigny)*	
Lepidorombus boscii (Risso)	*Eledone moschata (Lamarck)*	
Citharus linguatula (L.)	*Octopus vulgaris (Cuvier)*	
Cepola macrophtalma (L.)	*Pteroctopus tetracirrhus (Delle Chiaje)*	
Spicara flexuosa (Rafinesque)		
S. maena (L.)		
S. smaris (L.)		
Trachurus mediterraneus (Steindachner)		
T. picturatus (Bowdich)		
T trachurus (L.)		
Bothus podos podos (Delaroche)		
Argentina sphyraena (Valenciennes)		
Anguilla anguilla (L.)		
Gymnammotytes cicerelus (Rafinesque)		
Raja miraletus (L.)		

Bone fish	***Mollusca***	***Crustacea***
Raja clavata (L.)		
Raja asterias (Delaroche)		
Pagellus acarne (Risso)		
P. bogaraevo (Brunnich)		
P. erithrinus (L.)		
Pagrus pagrus pagrus (L.)		
Sparus auratus (L.)		
Trachinus draco (L.)		
Lepidotriglia cavillone (L.)		
Uranoscopus scaber (L.)		
Buglossidium luteum (Risso)		
Microchirus variegates (Donovan)		
Boops boops (L.)		
Dentex dentex (L.)		
Diplodus anularis (L.)		
D. puntazzo (Cetti)		
D. sargus sargus (L.)		
D. vulgaris (Geoffroy St.-Hilaire)		
Lithognatus mormyrus (L.)		
Obloda melanura (L.)		
Scorpaena notata (Rafinesque)		
S porcus (L.).		
S. scrofa (L.)		
Serranus cabrilla (L.)		
S. scriba (L.)		
Solea vulgaris (Quensel)		
Epinephelus aeneus (Geoffroy St.-Hilaire)		
E. marginatus (Lowe)		
Helicolenus dactylopterus (Delaroche)		
Seriola dumerilli (Risso)		
Mullus barbatus (L.)		
M. surmuletus (L.)		
Zeus faber (L.)		

Table 1.3.4. List of the sea species of Agrigento coast (Info: PMA di Miramare, Trieste, 2001)

1.3.6. ELEMENTS OF LANDSCAPE ECOLOGY

As for altimetry, the Torre Salsa ONR has a plano-altimetric configuration with a number of emerging elements that on the whole give birth to the fundamental "connection between shapes and landscape that characterize a scene". In fact, those who cross the area from the national road SS 115 to the sea, will take in a unite scenery with a glance, but at the same time this landscape is made up different aspects according to the variety of forms in a succession created by the territory morphology.

From above it is possible to make out the sea and a succession of shapes and colours that indicate the discontinuity of the territory, the different lithology and types of soil as well as the vegetal cover so highly differentiated thanks to its variety of forms that go from the meadowland to the brush and the garigue and the agro forestry vegetation that includes almost all the features of a cultivation area: afforestation, arboreal vegetation, vineyards and pastures.

Near the hedge of the cliff it is possible to appreciate one of the most beautiful littoral sceneries of the central southern Sicily coast. Comparing the extension of this cliff with that of the coastline to which it belongs, to define the former as a natural monument is not an exaggeration. The cliff slope gives to the Torre Salsa landscape the look of a succession of shapes ordered according to a perceptive hierarchy that goes from the coast evolutive dynamic aspects to the peculiarities of the gypsum-sulphur Sicily territory particularly evident in the central southern coasts. Sortino's analysis (2002) pointed out great limits to the intervisibility in depressions, which give births to humid environments, whereas, thanks to its physiographic and flora-vegetation features, the area between the plateau at the edge of the cliff and the relief delimited by the mountains *Monte dell'Eremita* (157.9 mt.); *Cupolone* (146.6 mt.); *Stella* (146 mt.), can be defined as a strategic area for the intervisibility of Torre Salsa landscape features.

1.4. SOCIO-ECONOMIC ASPECTS

1.4.1. GENERAL SOCIO-ECONOMIC ASPECTS

As far as the socio-economic sector is concerned, the main priority of the land use planning of the different municipalities located in the central and southern parts of Sicily should be the enhancement of the sea, considered as a resource, in the context of a well-balanced policy combining rural and recreational activities. This should lead to an overall standardization of the quality of life and of the economic and social factors in the different local areas (Sortino S., 2002).

The area of the Torre Salsa ONR has been a typical example of an area where private and public initiatives are rarely aimed at reaping the best results for society (Sortino, 2001). As a matter of fact, diseconomies of scale occurred owing to the irrational and non-coordinated spreading of small areas along the shores characterised by the combination of housing settlements and productive ones. These often led to interferences and contrasts among them and with the activities based on the enhancement and protection of the landscape and the natural environment. Suffice to think of the long-standing problems that still exist today which are linked to a large and spread lack of interest for environmental protection (arsons, poaching, irrational plans of land management etc) and to the necessity of implementing suitable urbanisation works for each local areas (sewing system etc.)

This situation inflicted irreversible damages to the local community (Sortino S., 2002) limiting the enjoyment of natural and landscape resources. This was due to the negative impact on the environment and on human health of the following factors:

- the lack of a comprehensive system of solid and liquid waste disposal
- the poor safety conditions of the road system and the transport network in general caused by heavy traffic congestion occurring especially in summer;
- the absence of suitable countervailing measures in the creation of network technological services.

The present biological resources of this area are the result of the cultivation policy which contributes to the creation of the landscape itself.

The agricultural exploitation reflects the geological, morphological and pedological characteristics on the one hand, and the economy, on the other. These resources determined:

- a discontinuous and partial exploitation of the soil with the enhancement of flat areas and of the natural dells in which a favourable amount of fertile debris was accumulated.
- the preservation of rather large rocky surfaces and of natural vegetation, used rationally for the cultivation of olive trees and almond trees or other fruit plants;
- serious obstacles to the mechanisation process and to the economic practice of agriculture.

The economic history and the different relationships between labour and land available determined:

- an intense work of conversion of the ancient grapevines cultivations, where this proved economically viable, combined with a progressive abandonment of a large portion of the cultivated soil due to the growing gap between costs (labour in particular) and profits;
- the preservation of loams as the only sowable land left. This is due to the fact that they are less subject to the action of the wind in areas of easier accessibility and suitability for

mechanization. These areas also present higher thickness and fertility of the cultivated layer.

- the presence of temporary fruit cultivations;
- pastureland use of abandoned cultivated land (sowable and planted with trees land)
- a subsequent process of degradation of the abandoned areas;
- the degradation of land and of the agrarian structures;
- the prevalence of invasive ruderals and nitrophilic weeds;
- the partial destruction of olive trees and other pre-existent species as a consequence of vineyard implantation and of fires;
- a considerable erosion of the soil

To sum up, the agrarian system is affected by an overall degradation caused by the transformation of the general economic system and the crisis of the productive model.

1.4.2. HISTORIC AND CULTURAL COMPONENTS

The portion of the shore occupied by the Torre Salsa ONR extends for approximately 15 km (6 of which occupied by the ONR) and it is characterised by low anthropization. However, the natural characteristics of the local areas were changed considerably during the last two centuries, especially during the "corn crises" of the 19th century.

This marginal portion of Sicily displays the most typical features of this region: landscapes characterised by rotating corn cultivations and fallows in scarcely inhabited areas, in which the human presence is shown only by ancient majestic farms once owned by barons. Such farms are surrounded by the modest houses of "jurnatari" (daily workers), by the small ever-present church and the stables.

This unique landscape is typical of Siculiana, a small village of tuff and gypsum houses clustered on a modest hill, dominated by an imposing church with a huge baroque dome that overlooks even the ancient feudal castle that was erected, for obvious reasons, on the highest part of the plateau. Montallegro is characterised by a similar landscape which may appear even more dramatic because of its history. In fact it is dominated by the spectral remains of the primitive settlement on the Cicaldo hill at the back.

Both villages are the symbol of a region that used to be the "barn of Italy" and which has been playing an important role for the whole country in the last few centuries. Here Sicily contributed to shape decisively the cultural and economic development of the community, until the recent land reforms and the assigning of lands to peasants. In this area an attentive visitor could definitely spot the secular marks of feudalism.

The uncultivated land, which used to be fallows, was abandoned by those peasants who did not manage to obtain the food that was necessary to feed their families thus being forced to migrate. Now the land is occupied only by different herbaceous species. Nowadays, the landscape surrounding Siculiana stretching towards Monte Grano Vecchio (whose name hints at the corn cultivation –Grano means corn in Italian) and the rocky faces of Roccia del Notaro is characterised by steppe and "garighe" (areas overgrown with bushes). The landscape appears in all its naturalness except for some artificial conic wells surrounded by some green areas which are scattered around on the gypsum ground characterizing the uneven mountainous areas. Although this land has been always extremely difficult to cultivate it has been ploughed and sown by generations of men. This spectacle of nature was

constituted by rises where white farms were built with gypsum which evoke memories of an ancient past. The sea is far away from here.

Although the landscape has been impoverished by anthropization, time seems to have stopped in the 1950's. Thus, the "Oriented Natural Reserve" of Torre Salsa, where along the hollow of the Pantano river, plots of dry sowable land beautifully decorated by wild untrimmed bushes alternating with stony and steppe ledges. The silence of these areas is interrupted only during summer days (from May to September), because of the vehicles of tourists heading for the beaches. The vehicular traffic provokes a cloud of white dust that whiten the steppe and the hedges of the fallows in the hollow of the Pantano river. The only signs of human presence are the small huts built with scrap materials which mark the cultivated crofts.

It is a landscape that seems to be lost in time and completely untouched despite the human signs mentioned above. During the feudal times only a few people lived in the countryside in small straw huts; most of people lived in the village "catoj" (very narrow rooms in which entire families used to live). Every day the "caporali" and "massari" recruited workers to till, sow, plough, harvest the gypsum lands owned by "marchesi" and "burgesi", the local aristocrats and leaders.

Siculiana and Montallegro were founded in Sicily during feudalism. The sea is two and five km far from the shore where the role of anthropization was really limited in the last two millennia. However, there are two exceptions: the Greek site of Eraclea Minoa and the "caricatore" (port of shipment of cereals) of Marina di Siculiana which was created in the modern era.

The ancient Eraclea, an ancient site that probably dates back to the Mycenaean age, became immediately a strategic centre for the city of Akragas (Agrigento) since it was located near the border with the Punic city of Selinunte; the border was marked by the Platani river (the city stands on the left bank) The historic documents (Herodotus, V, 46) that mentions the Punic origins of Eraclea were not confirmed by the archaeological activities carried out in the area (on the contrary a Punic settlement was found on the right shore). It is plausible to conclude that, de facto, Eraclea has been more a Punic city than a Greek one, even in the Roman age. As a matter of fact, the Roman fleet fought against the Punic fleet which had its own headquarters in the river port of Eraclea in 257 BC.

Subjugated by the Romans in 210 BC, the city did not last long and it was abandoned by its inhabitants within one century owing to the geological instability of the terrace on which it was built. The geomorphologic instability of the whole portion of shore stretching from Capo Bianco to Capo Russello has certainly hindered the creation of other cities in the following two thousand years.

Beside this natural obstacle, the Arab and Saracen incursions during the early Middle Ages also conditioned the creation of villages and cities at a considerable distance from the shore. The Arab city of Qal'at-Sugul (Siculiana) was founded at the air distance of 1 km from the sea; from its ashes at the end of the 14th century the feudal village that we mentioned before was created. The other surrounding villages such as Cattolica and Montallegro were created in the 17th century. The first one was a feudal agricultural village (the term Eraclea was added only in the 19th century because the ancient Greek site can be found at the border of the municipality). The second one, which was built a few decades earlier on the top of the Cicaldo hill, was very soon moved by its own inhabitants at the foot of the hill due to the instability of the area. Realmonte was also built at the end of the 17th century and it is distant more than 1 km, as the crow flies, from the sea.

The lack of safety of the Sicilian shores during the Middle Ages was already mentioned above. To defend the villages and farms of feudal agricultural production, a series of watch towers and defence towers were built at different historic times. In this area there are at least 7 towers: in Capo Bianco, Marinata, Sausc (or Sanso, nowadays called Salsa), Felice (or of Siculiana), Fiumarella, Monte

Rosso and Monte Rossello. The tower of monte Rosso is the only one which is still in good conditions; the others are in ruins (just like the one of salsa) or completely destroyed.

Thanks to this defence network on the shore the "caricatore" could flourish in the area of Marina di Siciliana, the only village built by the sea in the second half of the second millennium. At the beginning of the 20th century it was still "an aggregate of 90 warehouses and inhabited houses, with a small church and a precarious natural port which consisted simply of a set of rocks in the water"

As said before, the Capo Bianco cape is closely linked to the Greek site of Eraclea Minoa.

In Borgo Monsignore, 1-2 km as the crow flies from Eraclea, a Punic site was discovered. According to the experts it could be more ancient than the Greek site of Capo Bianco. The geographical configuration of the two sites and the geomorphologic characteristics that were described before make this chronology very likely. The Phoenician site, the most ancient, took advantage of the river port at the mouth of the Platani river which was 1 km north of the present position.

The political vicissitudes, linked to the Greek expansionism (of the city of Akragas), led to the abandonment of the Punic site of Borgo Bonsignore, after the creation of the new Greek city of Capo Bianco. In this respect, the experts know that the population of this city was constituted mainly of Punic people, even in the Roman age. The geomorphologic instability of the Greek site led to the decline of the area which was left abandoned until a few centuries ago.

The only exceptions were the few houses surrounding the modern "caricatore" of Capo Bianco at the mouth of the Platani river and the soldiers living in the Coast Guard tower that nowadays no longer exists. For more details about art and cultural estate and recent buildings see Annex 3, Torre Salsa Buildings Census.

1.4.3. ANTHROPIC ACTIVITIES AND USE OF THE AREA

According to recent studies (Sortino S., 2002), the area of the ONR Torre Salsa is *"a typical example of an area where private and public initiatives are rarely aimed at reaping the best results for society*".

The economic activities carried out in the reserve area are:

- Accommodation and facilities for tourists: there is a company managing the campers park, load/unload of goods, apartment rental. These activities are partly carried out in the A zone (vehicle parking in the area behind the coastal dune) thus infringing the rules of the Oriented Natural Reserve of Torre Salsa;
- Forest activities: these activities are carried out partly before the creation of the reserve and partly after receiving the necessary authorizations. These activities are developed exclusively with EU funds and the involved areas are in extremely bad conditions. The managing authority considers them as deteriorated areas to be recovered;
- Agricultural activities: these activities are characterised by the parcelling out of low-income properties with subsequent delay in the implementation of the enhancement strategies of local products;
- Sheep farming: there are 6 companies which introduce livestock in the reserve, on other people's land and only one of these has the permission of the managing authority; the other 5 are not in order.

This area, in particular, presents basically two different types of land:

- "unproductive" areas (in terms of cultivation) such as beaches, rocky shores, ditches and swamps.
- the terraces of the inland area and the sedimentary areas which are less steep or less integrated from a lithological point of view which were used in the last few centuries for agricultural purposes.

This portion of the shore is not affected by unauthorised building except for a few cases (an ancient farm which was restored on the coastal border between the mouth of the Pantano river and the Cannicella creek and two unauthorised buildings on the area neighbouring the WWF property on the slopes of the Monte Stella area).

Thanks to the opportune intervention of WWF the coast was not damaged and its landscape was preserved. In 1989 WWF bought 8.4 hectares of land on the Monte Stella area to stop the construction of a huge residential village. The project had been rejected by the regional Councillorship for Environment which had also decided to include the Torre Salsa area among the 78 regional reserves (D.A 970 del 10.6.1991).

The coast is presently used as a seaside resort, especially in the months of July and August.

The access to the shores is possible thanks to:

- a road belonging to the holiday farm called "Torre Salsa" (north of the area). Tourists and visitors (even if they are driving a camper) must pay a fee to the owners (in order to reach the area behind the coastal dune near Torre Salsa);
- a road connecting the different areas, which crosses the Pantano river to the mouth; this road is also used by cars and campers.

The actual surface of the area used for bathing purposes is very limited although it contributes significantly to the local economy in terms of profitability.

As far as the hinterland is concerned, the area is almost entirely used for cereal cultivations, vineyards and orchards. A portion of the agricultural land has been abandoned and it is used as grazing land together with the steppe area (the surface is approximately 300 hectares of the entire area). The remaining portion of the agricultural land is cultivated by using obsolete methods discarding all the advanced techniques which are currently available. The traditional cultivations of olive trees and almond trees is still practiced. In this area there are a few recent buildings whose architectural design leaves a lot to be desired and it is not well integrated with the other historic buildings of the area.

The crisis of the agricultural sector was also due the problems of the past decades which affected viticulture and olive growing as well as to the lack of infrastructure (inadequate irrigation network). This has affected the integrity of the trophic balance of natural ecosystems. In the future, agricultural development plans of the area could be decisive in the attempt to increase the "added value" of the land existing in this area.

The lack of deep changes of natural balance could thus facilitate the success of biological and biodynamic cultivations. Obviously, cultivation conversion requires a redevelopment of the agricultural building strategies according to the actions put forward in the attachment.

Reforestation interventions are also rather important in terms of relative surface which guarantee in some areas landscape integration, although it is not totally suitable for the endemic vegetation of the area.

The monitoring of building infrastructures is in the Annex 3, Torre Salsa Buildings Census.

1.4.4. STATE OF IMPLEMENTATION OF THE EXISTING PLANNING

On 19 June 2000, during the course of the Project LIFENAT/IT/6275, WWF Italy and the *Assessorato regionale al Territorio ed all'Ambiente* -the territory and environment Regional Department- signed in Palermo the concession agreement for the management of the Natural Oriented Reserve. The Natural Oriented Reserve "Torre Salsa" is part of the SCI southern area. The lifetime of the Agreement is seven years.

The initial deadline was 10 June 2007, but it has been extended until the end of 2007. The new Agreement is being drawing up.

The Regulation on the managing conditions and bans in force in the Reserve has been approved by the *Assessorato Regionale al Territorio ed all'Ambiente* in 1996.

It should be noted that this Reserve is called "oriented". Sicily regional regulation provides also for other kinds of natural reserve: the "totally protected"; "special" and "genetic" ones. Pursuant to the Regional Law No 98 of 6 May 1981, the aim of natural oriented reserves is to preserve the environment. Cultivation and agro-sylvo-pastoral activities are allowed as long as they do not put at risk the environment.

The Torre Salsa ONR has a total area of 740.9 hectares and is divided into two areas with different protective measures according to the following typologies:

The area called "A" is a reserve of 364.1 ha;
The area called "B" is a pre-reserve of 376.8 ha;

The reserve is within the municipality of Siculiana (2006 Progress Report, on the initiative of the WWF which is the managing organization).

In 2003, the port authority of Porto Empedocle (AG) issued an order that preserves and regulates the stretches of water in front of the reserve, extending the protection to the strip of sea that borders the reserve.

The use of the ONR is in line with the town plans of the competent local authorities, which establish the suitable use of the territory according to the ONR and Eraclea archaeological site characteristics (*Soprintendenza ai Beni Culturali di Agrigento*, the agency responsible for Agrigento artistic heritage).

The province of Agrigento is an area subject to land use restrictions on hydrogeological grounds and wooded areas referred to in the R.D. 3267/1923.

At a local level, risk maps and reports on the environmental upheaval of the province of Agrigento have been drawn up according to the A.O. 298/41.

The data regarding the territory of the province of Agrigento, which include the ONR, are centralized at a local level by the Land Information System (LIS). The LIS covers the following fields of investigation: basic cartography; spatial planning; environment; public infrastructures and social services.

1.4.5. ANTHROPIC ACTIVITIES REGULATION

With the Decree 23 June 2000, which founds the Torre Salsa natural reserve on the territories of Siculiana and Montallegro municipalities (province of Agrigento), came effective the regulation on the managing conditions and bans in force in the Torre Salsa ONR.

REGULATION IN AREA "A"

Art.1 – Allowed activities

1.1 Without prejudice to the rules laid down in art. 3, in the reserve it is allowed to:

a) carry out repair works on the real estates as referred to in art. 20, letters a); b); c) and d) of Regional Law No 71/78. The interventions set out in letters b) and c) are submitted to the authorization of the managing organization. The interventions set out in letter d) are allowed only for reasons concerning the reserve managing and fruition and are subject to prior authorization of the Assessorato regionale al Territorio ed all'Ambiente, *after consulting with the* Consiglio regionale per la protezione del patrimonio naturale (C.R.P.P.N.), *the regional council for the preservation of the natural heritage. Restoration and preventive works are allowed for already existing and registered buildings and for those registered ruins which can supply with regular documentation;*

b) change the purpose of real estates involved in the above-mentioned repair works only when closely necessary to the prosecution of allowed activities or to the reserve managing activity, with prior authorization of the managing organization;

c) carry out routine and extraordinary maintenance on roads, mule tracks and paths in accordance with the planimetric, altimetric, typological and formal configuration, with prior authorization of the managing organization;

d) carry out routine and extraordinary maintenance on existing distribution network installations, with prior authorization of the managing organization, with the obligation to restore the site using renaturation techniques;

e) build movable structures in wood or other natural material only for managing purposes in case the reserve does not have any building that could serve this purpose, with prior authorization for the Assessorato*, after consulting with the C.R.P.P.N.;*

f) carry out the existing livestock and farm activities (as long as they are small agricultural holdings with human settlements as referred to in the antipollution regulation) and replace the existing crops with others among the local ones, taking into account the crop rotation. Any other possible transformation that could modify the typical farm landscape or involve earth displacements has to be subjected to prior authorization of the managing organization.

Depending on the natural management actions, pasturage is allowed within the limits necessary to ensure the preservation and/or re-growth of the vegetation cover and the natural renewal process.

Pasturage is always subject to the authorization of the managing organization that will set time and area limits as well as limits regarding the quantity of livestock according to the spices;

g) carry out structural and land improvements, without prejudice of the bans referred to in the following art.3, after receiving the opinion of the C.R.P.P.N. Before granting the authorization, the council will assess the acceptability of the actions to be taken on the basis of the size and potential and Assessorato *output of the plot of land as well as their compatibility with the reserve purposes. Requests*

must be submitted to the Assessorato *through the managing organization, which has the burden of expressing its opinion on the actions submitted;*

h) take action to protect forest covers for naturalistic purposes and create fire protection areas, without prejudice to the ban on opening new access tracks and on making preventive structural interventions.

The implementation of the vegetation cover should also comply with naturalistic criteria, encouraging the preservation and growth of brush and woodland features.

Any intervention is subject to the authorization of the managing organization;

i) carry out renaturation and environment restoration actions according to naturalistic criteria, with prior authorization of the managing organization;

l) go hiking. Hiking is not limited. There are horse trails with possible limitations on the frequency to avoid making environmental damages and disturbing the fauna. The managing organization has the power to regulate and extend the limits to the reserve activities in such a way as to preclude completely the visit to some areas for scientific research or environmental preservation purposes;

m) fence one's own properties only with hedgerows and/or fences made with natural materials, according to the local practice and with autochthonous species;

n) drive motor vehicles on the existing road network, except for mule tracks and paths and to have access with motor vehicles to the plots of land in order to run the allowed activities. The managing organization can regulate or forbid entrance to any non-connecting major route in case of particular managing needs or for preservation purposes.

Art. 2- Prohibitions

2.1 Without prejudice of the prohibitions referred to in the national and regional law in force on the preservation of cultural and environmental heritage as well as soil, water and air from pollution, on afforestation, forest wardens, hunting and on the prohibitions referred to in art.17 of Regional Law No 98 of 6 May 1981 as subsequently amended, it is prohibited to:

a) build any new construction and carry out any activity involving the change of the urban assets or any other building activity such as: the opening of new roads or tracks, formal or typological plano-altimetric changes as well as the building of power transmission systems, aqueducts, telephone lines and technology net-connected systems. the building of power transmission systems, aqueducts, telephone lines and technology net-connected dug trenches systems on existing roads can be allowed by the Assessorato regionale del territorio e dell'ambiente*, after consulting with the C.R.P.P.N. with the obligation to restore the site. The creation of new paths with the only purpose of improving the fruition of the reserve can be included in the restoration plan.*

b) demolish and rebuild existing real estates, except for unstable buildings, maintain the same cubage and purpose of the estate according to the typological and formal local features, with prior authorization of the Assessorato del territorio e dell'ambiente*, after consulting with the C.R.P.P.N.;*

c) place prefabricated buildings or even movable structures or caravans, except for what referred to in art.2, letter g). Derogation of the rules is possible only for the managing organization and for managing purposes when no existing building can be used and with prior authorization of the Assessorato del territorio e dell'ambiente, *after consulting with the C.R.P.P.N.;*

d) damage or close swallow-holes and natural cavities and interrupt, even only partially, possible fluid or gaseous emissions;

e) open quarries or mines and carry out extracting activities, as well as remove any material or dig wells, draw and distribute water, build cisterns, except in case these serve the existing houses in the A area for farm purposes, with prior authorization of the managing organization;

f) have any industrial activity;

g) build dumps and any other refuse disposal facility as well as unload earth or any other solid or liquid substance;

h) move earth, except for purposes concerning the activities allowed by this regulation. Digging or underground activities have to be examined by the managing organization in order to check the integrity of the area below;

i) remove or damage rocks, minerals, fossils and finds of any kind, even when in superficial loose fragments, except for purposes concerning scientific research and for the researchers specifically authorised by the managing organization;

l) introduce hunting firearms, explosives and any other instrument for the hunt and damage of animals;

m) hunt and bird-catching and to disturb wildlife in any way, bother or catch vertebrates and invertebrates, to pick up, disturb or destroy nests, eggs, lairs and beddings, except for purposes concerning the activities allowed by this regulation, with prior authorization of the managing organization;

n) destroy, damage or remove spontaneous covers of any spices and kind or parts of them, except for those concerning the carry out of the activities allowed by this regulation, with prior authorization of the managing organization. The collection of spontaneous edible vegetables can be regulated by the managing organization as for seasons, quantities and species;

o) modify the balance of natural biological communities through the introduction of species that are not part of the autochthonous flora and fauna. The possible reintroduction of extinct species has to be authorised by the Assessorato del territorio e dell'ambiente*, after consulting with the C.R.P.P.N.;*

p) build glasshouses or equivalent structures to carry out farm activities in a protected areas;

q) introduce and use any mean of destruction or modification of the biogeochemical cycles;

r) leave rubbish outside the specially provided containers;

s) leave the specially created tracks;

t) go camping or build a campfire;

u) light fires in the open air, except for those necessary to the agro-sylvo-pastoral activities, without the authorization of the managing organization;

v) advertise, mount folkloristic and sport events without the authorization of the managing organization;

z) over fly with non authorised aircrafts, except in the cases referred to in flight control regulation for rescue and monitoring reasons;

aa) carry out sport activities that could endanger the environmental integrity and the quiet of the site, such as motoring, trials, motorcycling, motocross, hang-gliding, etc.;

bb) use sound reproducing machines, except when wearing headphones or in case of scientific researches, service, monitoring and rescue activities;

cc) transport arms of any kind, when not unloaded and closed in their special cases. Except for personal defence and with the specific licence of the Authority for Public Security;

dd) carry out any fishing activity, aquaculture or any activity with the purpose of increasing fish resources;

ee) carry out any activity that could modify the regime, the course or the composition of water, except for farm activities needs and after having received the authorization from the managing organization as well as for fire-fighting purposes.

Derogations of the rules have to be allowed by the managing organization pursuant to this article and have to be specific, personal and limited in time.

TITLE II
REGULATION IN AREA "B"

Art. 3 – Allowed activities

1.1 The new buildings within the protected area of the reserve (pre-reserve) have to be dedicated only to the fruition of the reserve or to managing activities.

1.2 Without prejudice to the rules referred to in the following art. 4, within the protected area of the reserve (pre-reserve), it is allowed to:

a) carry out the existing livestock and farm activities (as long as they are small agricultural holdings with human settlements as referred to in the antipollution regulation) and replace the existing crops with others among the local ones, taking into account the crop rotation. Any other possible transformation that could modify the typical landscape or involve earth displacements has to be subjected to prior authorization of the managing organization. Depending on the natural management actions, pasturage is allowed within the limits necessary to ensure the preservation and/or re-growth of the vegetation cover and the natural renewal process. Pasturage is always subject to the authorization of the managing organization that will set time and area limits as well as limits regarding the quantity of livestock according to the spices;

b) carry out structural and land improvements with prior authorization of the Assessorato del territorio e dell'ambiente, after consulting with the C.R.P.P.N. Before granting the authorization, the council assesses the acceptability of the actions to be taken on the basis of the size and potential and current output of the plot of land as well as their compatibility with the reserve purposes. Requests must be submitted to the Assessorato *through the managing organization, which has have the burden of expressing its opinion on the actions submitted;*

c) light fires in the open air for the agro-sylvo-pastoral activities;

d) carry out forestry activities and fire-prevention interventions, with prior authorization of the managing authority;

e) Within the obligations set in the Art. 22 of Regional Law No 98/81 as subsequently amended:

1) carry out repair works on the real estates as referred to in Art. 20, letters a); b); c) and d) of Regional Law No 71/78. The interventions set out in letter d) are allowed only for reasons concerning the reserve managing and fruition and are subject to prior authorization of the Assessorato regionale al Territorio ed all'Ambiente, *after consulting with the C.R.P.P.N. Restoration and preventive work are allowed for already existing and registered buildings and for those registered ruins which can supply with regular documentation;*

2) change the purpose of real estates involved in the above-mentioned repair works only when closely necessary to the prosecution of allowed activities or to the reserve managing activity, with prior authorization of the managing organization;

3) carry out routine and extraordinary maintenance on roads, mule tracks and paths in accordance with the planimetric, altimetric, typological and formal configuration, with prior authorization of the managing organization;

4) *Build distribution network installations for water, electricity, communications, gas, etc. with prior authorization of the* Assessorato regionale al Territorio ed all'Ambiente*, after consulting with the C.R.P.P.N. with the obligation to restore the site, using for this purpose renaturation techniques;*
5) *fence one's own properties only with hedgerows and/or fences made with natural materials, according to the local practice and with autochthonous species;*

Art. 4 - Prohibitions

4.1 Without prejudice of the prohibitions referred to in the national and regional law in force on the preservation of cultural and environmental heritage as well as soil, water and air from pollution, on afforestation, forest wardens, hunting and on the prohibitions referred to in Art.17 of Regional Law No 98 of 6 May 1981 as subsequently amended, it is prohibited to:

a) demolish and rebuild existing real estates, except for unstable buildings, maintain the same cubage and purpose of the estate according to the typological and formal local features, with prior authorization of the Assessorato del territorio e dell'ambiente*, after consulting with the C.R.P.P.N. Moreover it is prohibited to build any new construction as well as place prefabricated buildings, even in case of movable structures or caravans, except for the derogations referred to in Art. 4.1 and 4.2, letter b), with prior authorization of the* Assessorato regionale al Territorio ed all'Ambiente*, after consulting with the C.R.P.P.N.;*
b) build glasshouses or equivalent structures to carry out farm activities in a protected areas;
c) have any industrial activity;
d) build dumps and any other refuse disposal facility;
e) damage or close swallow-holes, natural cavities and springs;
f) unload earth or any other solid or liquid substance;
g) remove or damage rocks, minerals, fossils and finds of any kind, even when in superficial loose fragments;
h) remove sand, earth or any other material;
i) leave rubbish outside the specially provided containers;
l) go camping or build a campfire outside the service areas;
m) carry out sport activities that could endanger the environmental integrity and the quiet of the site, such as motoring, trials, motorcycling, motocross, hang-gliding, etc.;
n) hunt and bird-catching and to disturb wildlife in any way, bother or catch vertebrates and invertebrates, to pick up, disturb or destroy nests, eggs, lairs and beddings, except for purposes concerning this regulation, with prior authorization of the managing organization;
o) destroy, damage or remove spontaneous covers of any spices and kind, parts of them, except for those concerning the carry out of the activities allowed by this regulation, with prior authorization of the managing organization. The collection of spontaneous edible vegetables can be regulated by the managing organization as for seasons, quantities and species;
p) modify the balance of the biological communities through the introduction of species that are not part of the autochthonous flora and fauna. The possible reintroduction of extinct species has to be authorised by the Assessorato del territorio e dell'ambiente*, after consulting with the C.R.P.P.N.;*
q) over fly with non authorised aircrafts, except in the cases referred to in flight control regulation for rescue and monitoring reasons.

TITLE III
COMMON RULES

Art. 5 - Scientific research activities

5.1 On the whole protected area, qualified bodies authorized by the managing organization are allowed to conduct scientific researches. Only for this purposes the organization can give derogations of the rules that have to be specific, personal and limited in time. The results and copies of the researches carried out have to be communicated and handed over to the managing organization and to the Assessorato del territorio e dell'ambiente.

Art. 6 – Organic farming

6.1 The preservation of traditional cultivations, the use of organic techniques as well as the conversion of actually used agricultural and cultivation techniques into organic ones are fostered, pursuant to Community Regulation No 2092/91 of 24 June 1991, 2328/91 of 15 July 1991, 2078/92 of 30 June 1992 as subsequently amended.

6.2 The owners or tenant of the lands cultivated with organic techniques can apply for a contribution to the managing organization presenting the relevant documentation with the title deed and/or the tenancy deed, the register of the plots of land and the certification of the authorised professional control body, are referred to in the existing law.

6.3 the managing organization communicate to the Assessorato del territorio e dell'ambiente *the application for assistance together with the programmatic report, after having verified that they posses the necessary qualifications for it.*

Art. 7 - Local Fauna

7.1 There are contributions to the preservation of local races living in the protected area that have historical and cultural importance and are in danger of extinction.

7.2 The distributional area of these local races has to be part of the territory of the protected area. Breeding has to be pure, no stall housing is allowed.

7.3 The managing organization passes on to the Assessorato del territorio e dell'ambiente *the applications for assistance together with the programmatic report, after having verified that they possess the necessary qualifications for it.*

Art. 8 - Compensation

8.1 In case the pursuit of institutional purposes of the reserve causes reductions of the agro-sylvo-pastoral benefits, the managing organization, to which the provided claim forms have to be submitted, will give compensation.

8.2 The managing organization will also give compensation for the damages caused inside the protected wildlife area, according to the referred to in Art. 22 of Regional Law No 14/88.

Art. 9 - Wildlife management

9.1 Within the protected area it is allowed to carry out interventions regarding fauna managing which purposes and limits are referred to in the following paragraphs, after receiving the opinion of the Assessorato del territorio e dell'ambiente *and the C.R.P.P.N.*
9.2 It is not allowed to found and manage restocking areas, public and private breeding centres, dog training or competition areas, faunal-hunting farms, tourist agro-hunting farms and any other institution based on the catching and/or killing of wildlife or bred animals, as referred to in the faunal-hunting regulation.
9.3 The managing organization can arrange catching and/or killing plans in case single wild species or feral domestic animals grow excessively in a way as to endanger the ecological balance and to be a threat to man and a serious damage for agro-sylvo-pastoral activities. Possible fauna catching and selective killing must be limited to the quantity necessary to restore the ecological balance established by the managing organization. Captures and selective killing must be allowed by and under the responsibility and monitoring of the managing organization and must be carried out by the organization staff.
Killings in case of excessive growth of single wild species must be carried out by qualified personnel authorised by the managing organization itself following an indication from the relevant local authorities for hunting.
Single killings must be carried out under the responsibility and monitoring of the managing organization staff.
9.4 The aim of any intervention on the balance of the trophic chain is first of all to try to restore the prey-predator balance. The biological control will be carried out, when necessary, verifying its effects also on other species.
9.5 The managing organization, in agreement with the relevant regional authorities, will elaborate a plan for the faunal management on the basis of detailed researches on fauna coming from different ecosystems and their main trophic chains. The possible reintroduction of species that had once lived in that territory and that are nowadays extinguished has to be preceded by researches that take into account the positive and/or negative effects on the present ecosystems balance. Similar researches have to be carried out to decide on the possibility to restock certain areas. At any rate, the restocking has to be carried out starting from autochthonous populations in order to ensure the native gene pool maintenance.

Art. 10 - Special Measures

10.1 After the corroboration of the existence in the area, even if irregular, of protected animal species as referred to in the FFH Directive No 92/43 as subsequently amended, the managing organization has the burden of implementing special preservation measures to ensure the habitat integrity and forbid any activity that may disturb or interfere with reproduction.
10.2 Moreover, the managing organization will accept and localize priority vegetal species and habitats as referred to in the above mentioned Directive and implement the signalling measures needed to protect these species.

Art. 11 - Safeguard regulation for the sea areas that border with the reserve

11.1 In order safeguard properly the sea and coast ecosystem, in the sea area that borders the reserve, the sea activities have to comply with the restrictions established by the appropriate shipping authority. The managing organization will agree with the shipping authority on the most suitable measures to safeguard the environment, within the framework of the relevant directives of the Assessorato del territorio e dell'ambiente.

Art. 12 - Monitoring activity and sanctions

12.1 Grants or authorizations have to be imparted promptly by the relevant authorities to the managing organization and the proper forester body in order to take up monitoring activities.
*12.2 The break of the limits and prohibitions provided for by this regulation are punished in accordance with Art. 23 of Regional Law No 98/81 as replaced by Art.28, paragraph 9 of the Regional Law 24 April 1999 (*Gazzetta ufficiale della Regione Siciliana, *Official Journal of the Region of Sicily No 20 on 30 April 1999).*
12.3 The corroboration and the notification of the breaking of the above-mentioned prohibitions imply at any rate the immediate termination of the forbidden activity and the obligation to restore the site at offender's expenses as well as the restitution of what has been possibly removed.
12.4 The managing organization enjoins the offender the restoration of the site referred to in the previous paragraph, within a set time limit that must not be inferior to 30 days, pursuant to prescriptions of the organization itself that has the responsibility to regulate its implementation.

Art. 13 - Final Regulation

In the reserve it is prohibited to carry out any activity that could endanger the preservation of landscape, natural elements, vegetation and fauna.

2. TERRITORY INTERPRETATION

The common methodology elaborated in the Lansible project allows to estimate objectively also scale landscapes, most of all when working in areas where the natural residuality/marginality is marked as for the Torre Salsa ONR, a natural relict of great value embedded in the Agrigento coast.

From the above-mentioned researches on the area (the naturalistic system, the anthropic system, etc.), it is evident that the area is peculiar both under the geomorphic and landscape point of view, as well as for the biologic one that makes it different from the territory context of the central southern Sicily coast so greatly anthropized.

As underlined by Sortino S. (2001), the reserve is so peculiar mainly thanks to the presence of a substantial number areas characterized, from the very low altitudes to the higher ones, by dunes and, in many cases, by quite wide retro-dunal areas connected through a cliff to the upper terraces. These terraces, in turn, are a barrier for the mountains over the national road SS 115.

These differences create a vegetation cover that includes vegetal psmannophile and hydro-psammophile forms and many aspects of the Oleo-Ceratonion evolution series.

Moreover, slope study and geopedology play a crucial role in the natural features analyzed, as it is possible to notice in every permanently inhabited geographical area like the Sicily coasts.

The limited anthropization of the area is due to the geo-morpho-pedological marginality also of less sloping sites which soils are scarcely deep and rocky. This situation is worsened by the dry climate and the exposure to salty winds.

Morphology, slope study, pedology and meteo climatology are basic parameters to take into account when establish similarities among different areas, but the peculiarities of Torre Salsa, within the context of the central southern Sicily coast, are also due to its morphological configuration that creates one of the most beautiful landscapes of this coastline. Thanks to its configuration it has been possible to preserve almost intact many natural resources both litologic, biologic and ecologic.

The conclusions, in line with the previous researches (Sortino S., 2002) on the abiotic components of the area, clearly underline the very limited vocations as for their value. Nevertheless, as this value causes a limited anthropic impact on the area, it allows preserving landscape aspects characterised by valuable resources.

As for the biotic components (flora, vegetation, habitat, fauna), the study focused on the area naturalistic value. To check the environment health status, ecological successions have been analysed as though the study of the vegetation evolutive dynamic (potential and real) it is possible to understand the progression or regression stage of the present situation that is an aspect of the anthropic impact duration and weight.

The existing vegetation series are characterised by a vegetation dynamism heavily marked by more and more mature features. These data can be deduced by the presence of vegetal populations that represent both the "pedoclimax", like in the psammonic series and the evergreen sclerophyllous marl-limestone series, and the "paraclimax" like in the argillaceous gully substrates.

In the Torre Salsa area, the presence of many subclimacic shrubs due to the reafforestation of post-dunal areas and to plateau with allochthonous plants, underline that the preservation against the anthropic impact is crucial to make this area "natural".

The spatial order, that can be deduced by the number of vegetation typologies on the territory, their spread and most of all by their distribution on the area, allowed to understand the correlations between an horizontal structure of the vegetation cover and the environmental conditions. The results underline that, in spite of the limited extension, as for the horizontal structure, the area has a

considerable diversification of the vegetation cover which is a sign of the diversity of the soils (psammonic, marl-calcareous, gypseous, marsh, etc.) and the anthropic pression (reafforestation with allochthonous plants, cultivations, untended fields, quarries, etc.). From the integration of the information coming from the natural potential and real vegetation study, it is possible to deduce that Torre Salsa is an area characterised by a mosaic of natural vegetation and agro forestry forms, which are representative of the physiognomic and structural peculiarities of the present vegetal landscape of the southern Sicily cast.

VEGETATION TYPOLOGIES	EXTENSION (HECTARE)	PERCENTAGE %
Garigue formations	697.11	27.4
Vineyards	577.38	22.7
Arable land	50912	20.0
Arboreal vegetation	167.77	6.6
Reafforestation	141.58	5.6
Fallow	104.86	4.1
Tamarix forests	93.88	3.7
Cane thickets	76.24	3.0
Psammonic vegetation	51.85	2.0
Scrub	49.54	1.9
Soil tare	36.97	1.5
Orchards	22.10	0.9
Hedgerows	13.12	0.5
Tot	2541.88	100

Table 2.1 Division of natural and agro forestry vegetation in the ONR Torre Salsa and adjacent areas

Comparing real and potential vegetation it becomes clear that potential natural vegetal forms are the 38% of the total. This rate underlines that the natural and landscape value of the vegetation cover is within a range from modest to high according to the vegetation typologies and their distribution on the territory. Using also for agro forestry vegetation some of the flora and vegetation markers such as the division and dynamic of the cultivations, the ecologic value of the species cultivated, the spatial order of the cultivations, connectivity, circling and cultivation techniques (Forman and Godrom, 1986) it is possible to integrate this division with the knowledge necessary to understand the structural agro system features. From the data integration it is evident that culture division and dynamic are influenced by the territory economic history and by the climate and soil features.

The lack of water resources (as shown by the 0.9% of orchards) that could be a good way to compensate for the dry climate, is another crucial limit to the riconversion of the current cultural situation into intensive cultivation models. The current spatial planning of the cultivation areas is due to an unsteady exploitation of the soil for vineyards and olive groves and in part for almond trees cultivation in the most inaccessible areas or among the crags and on the most marginal pastures. Having indulged in the crop suitability of the soils has determined a spatial order of the cultivations which maintained unaltered wide rocky areas with many positive effects both on the aesthetic and landscape aspects, and on the biological ones thanks to the presence of the olive tree and other spontaneous plants. The ecological value of the cultivated species can be considered high as these

cultivations are characteristic of the agricultural landscape of the western Mediterranean basin. It has to be noted that the quality and agricultural fruition intensity of the soil of Torre Salsa and other adjacent areas strengthen its positive value as they preserved important aspects of the natural vegetation cover typical of the Mediterranean inalterated coastlines, together with landscape aspects full of naturalistic features (Sortino S., 2002).

The preservation of the environment and its natural resources has a traditional meaning in areas with local agriculture in which, to preserve the biological resources, it is not necessary to use significant external energy inputs and to shoulder the heavy financial responsibilities that intensive agriculture needs. To adopt productive agro-ecological models on this territory only reorganization actions are needed in order to optimize the present model marked by the respect of the environment balance thanks to the implementation of eco-technologies in line with the traditional ones. The comparison between the present cultural division and the natural vegetation potentially suitable to be introduced in the different areas confirms that the anthropization level of the area has to be considered in a range between weak and medium according to the significant presence of scrub, garigue formations, hydrophilous swamp vegetation, hygrophilous riparian psammonic brush that balance the artificiality levels due to arable lands and vineyards. It has to be added that the limited presence of human settlements, transport infrastructures and network technology services do not endanger the connectivity and circling referred to as efficiency in functional exchanges within agro system.

These markers show moderate values due to the presence of junctions and passages between the cultivated and the semi-natural areas and also due to a wide windbreak hedgerow network. The semi-extensive organization of the land involves the use of cultivation techniques that do not endanger the ecological balance because of its limited nutrient and pesticides input and because of the use of machining which does not prejudice the morpho-pedological features of soils and does not cause significant impacts on the trophic networks. As a consequence, the present agro system situation does not prejudice the preservation of wild flora and fauna.

Level	Anthropic action	Vegetal forms
0	Absent	Woodland, shrubs or herbaceous plants that represent the maximum stable biological activity called pedoclimax. Rational usage.
I	Weak	Copses, high forests, meadowlands, chestnut woods in hardwood forests, hygrophilous riparian and lotic vegetation.
II	Medium	Decayed woods, open woods, garigues, pseudo-garigues and meadows with bushes degenerating or evolving into a climax formation.
III	Strong	Transformation of the ecosystem vegetation into crops: Hay meadows, orchards, untended fields.
IV	Very strong	Dry and not well-watered arable lands, specialized crops.

Table 2.2 Anthropization levels (Sortino S., 2002)

As far as the socio-economic aspects are concerned, the present situation suggests that the technical intervention regulation should act according to two different but complementary guidelines: from the one hand promoting to the utmost the implementation of all those actions connected to the strengthening of synergies between ecological activities and tourism, from the other hand promoting all the resources that have a naturalistic, landscape and socio-cultural importance.

In this context, the preservation of rural building and the selection of planning criteria that could economically promote the area with the purpose of implementing modern sustainable tourist facilities have a special meaning.

The safeguard of the habitats of Torre Salsa marginal and residual rocky areas can be implemented by allowing farm activities compatible with the vulnerability of the sites.

As far as the value of the areas is concerned, the tourist nature of the area due to the beautiful landscape and resources is of course territory a value that promotes active economic flows for the whole community as a substitute for the decayed and inactive agricultural activities.

The tourist activity is considered important in order to evaluate the socio-economic situation and a compare the territory potentialities and the expectations of the population as regards the recreational and scientific purposes.

3. TERRITORY EVALUATION

The multidimensional line of action espoused by the Landsible project for the assessment of the environmental status of anthropized areas is not consistent with previous analysis on the Torre Salsa ONR.

The table hereinafter shows a flexible methodological route (for example, the inclusion of further entries -like fauna- would be desirable).

Compartments, components and environmental factors			
Level 0	**ENVIRONMENT**		
Level I	**ABIOTIC COMPARTMENT**	**BIOTIC COMPARTMENT**	**SOCIO-ECONOMIC COMPARTMENT**
Level II	Morphology	Flora	Agro forestry vegetation
	Landscape	Vegetation	Facilities
		Habitat/Climax	Development
Level III	**MORPHOLOGY**	**FLORA**	**AGROFORESTRY VEGETATION**
	Slope study	Autochthonous	Arboreal vegetation
	Geology	Forest	Vineyards
	Pedology	Agricultural	Arable land
		Allochthonous	Pastures
			Reafforestation
	LANDSCAPE	**VEGETATION**	**FACILITIES**
	Landscape values	Brush	Road network
	Monumental natural values	Garigue	Technology services and network
		Meadowland	System of trenches
		Beach vegetation	Rural building
		Moist environment vegetation	
		HABITAT	**DEVELOPMENT**
		Trophic chain (trophic network)	Economic activities
		Biodiversity	Recreational activities
		Connectivity	Cultural activities
		Circling	

Table 3.1 Methodology table for territory evaluation

This distribution in subordinate groups recently enabled to carry out a very uniform evaluation of the Torre Salsa environment quality (Sortino S., 2002) as the values regarding the resources both independent and dependent on the use of any of these groups, have been indexed according to their significance in portraying their higher membership group.

The index of the resources values is shown in Table 3.2. Table 3.3 summarizes the results of the evaluations (Sortino S., 2002) and underlines the percentages of the most distinguishing components and factors.

MORPHOLOGY						**LANDSCAPE**	
Slope study		**Geology**		**Pedology**			
0-5%	9	Sea terraces	8	Regosols – Brown soils	7	Landscape values	9-1
5-10%	7	Argillaceous formations	6	Brown soils - calcareous brown soils	5	Monumental values	9-1
10-15%	4	Alluvial	6	Regosols - Lithosol	2		
15-25%	2	Montallegro	5	Hydromorthic soils	2		
25-<35%	1	Cattolica gypsum karst	4	Dunes	1		
		Arenazzolo	3				
		Pasquasia gypsum karst	3				
		Trubi	2				
		Dunes	1				
FLORA		**NATURAL VEGETATION**		**Habitat/Climax**		**AGRO-HORTICULTURE VEGETATION**	
Autochthonous/others		Brush	9	Food chain	1-9	Well-watered arboreal vegetation	9
		Garigue	7	Biodiversity	1-9	Vineyards	5
		Sand vegetation	8	Connectivity	1-4	Arboreal vegetation	2
		Moist environment vegetation	8	Circling	1-4	Wood	2
		Pastures	5			Arable land	2
						Pastures	1
FACILITIES				**DEVELOPMENT**			
Road network		1-6		Economic activities		1-9	
Commercial facilities		1-6		Recreational activities		1-9	
Irrigation		1-4		Cultural activities		1-9	
Rural building		1-7					
Network technology services		1-4					

Table 3.2 Resources value index (Sortino S., 2002)

In conclusion, the reasons why the territory analyzed needs protective measures can be ascribed to these points:

- **Reasons of general interest.** For the limited antrophic influence so far as concerns the territory information about the soil use, services, environmental constraints in force and the limited agronomic value of the area.
- **Reasons of scientific, aesthetic and educational interest.** The Torre Salsa vegetation is a significant example of the widespread scrubland and psammonic vegetation that had characterized in the past the central southern Sicily coastline.

ENVIRONMENT = 1000					
ABIOTIC	**313,6**	**BIOTIC**	**423,7**	**SOCIO-ECONOMIC**	**262,7**
MORPHOLOGY	**146,6**	**FLORA**	**200,3**	**AGROFORESTRY VEGETATION**	**92,2**
Slope study	**165,4**	**Autochthonous**		**Well-watered arboreal vegetation**	**4,3**
Geology	**146,7**	**Forest**		**Vineyards**	**50.4**
Pedology	**127,6**	**Agricultural**		**Dry arboreal**	**4,7**
		Allochthonous		**Wood**	**4,7**
				Arable land	**26,0**
				Pastures	**2.1**
LANDSCAPE	**167**	**VEG. NAT.**	**994**	**FACILITIES**	**16.6**
Landscape values	**181**	**Brush**	**5.3**	**Road network**	**10.1**
Natural monumental value	**153**	**Garigue**	**62.6**	**Commercial facilities**	**0.2**
		Meadowland	**5.9**	**Network technology services**	**0.1**
		Psammonic vegetation	**20.0**	**System of trenches**	**0.4**
		Hygrophilous vegetation	**5.87**	**Rural building**	**5.8**
		Habitat/Climax	**124**	**DEVELOPMENT**	**153.9**
		Food chain	**168**	**Economic recreational activities**	**100.9**
		Biodiversity	**167**	**Cultural activities**	**53**
		Connectivity	**84**		
		Circling	**76**		

Table 3.3 Percentage values of the components and environmental factors (Sortino S., 2002).

4. POSSIBLE IMPACTS ON THE SITE

4.1. POTENTIAL IMPACT OF SWIMMING

Thanks to its good conservation status, the dune area adjacent the sea is a crucial factor of the local tourist activity. Moreover, in the last few years, it is popular among tourists coming from other provinces of Sicily. Nonetheless, the national and international tourism flow is still limited. The site is frequented by bathers during the summertime, most of all the access areas with their unpaved roads and crossing cattle-tracks that lead to the sea. In the Torre Salsa Natural Oriented Reserve, it has been noticed that along the dusty cattle-track that crosses the area called Pantano -used to get to the beach- the vehicle traffic produces an excessive sedimentation on halocnemum strobilaceum vegetation endangering its existence. A similar phenomenon can be observed along the track that goes from the holiday farm "Torre Salsa" to the coast where, during the summertime, there is an excessive presence of caravans, campers and motor vehicles right in the retro-dunal area. In some point in this area, the road has modified the natural water drainage with effects on the retro-dunal and supralittoral vegetation. There is a similar presence of parked motor vehicles near the mouth of the torrent Pantano, which safeguard is crucial to the preservation of the Sicilian marsh turtle (*Emys trinacris).*

The presence of a great number of bathers during the summertime is the plausible cause of disturbance of the sea Turtle (*Caretta caretta)* egg deposition. For this purpose it is desirable to increase the daily monitoring in the early morning during the mating season, in order to estimate the importance of the tracks left by the animals on the beach and the possible presence of nests. The monitoring activities could be integrated by volunteer and research services through agreements with NGOs and research agencies.

The straying control needs *ad hoc* analysis.

Also an information campaign addressed to residents, tourists, bathers as well as an environmental education course addressed to local schools of any level are to be considered crucial factors against the threats.

4.2. POTENTIAL IMPACT OF CULTIVATIONS

A quite usual phenomenon in the Mediterranean area is the abandoning of traditional cultivations as the crop rotation of leguminous and graminaceous plants, olive, almond and carob trees due to their limited profitability. The abandoning of this kind of cultivation could pose serious risks for the integrity of the trophic balance of natural ecosystems threatening it with the introduction of new growing and fertilizing techniques.

4.3. POTENTIAL IMPACT OF FIRES

The Agrigento area is characterized by the presence of pasture activities (ovine and goats) most of all in the retro-dunal areas of the whole coast which put at risk the flora composition of this sites.

In the Torre Salsa ONR the awareness-raising and direct participation activities addressed to local shepherds, promoted by the Project *LIFE Natura* led to important results from a strictly environmental point of view (preservation of the habitat extension): nonetheless, fires are still a real threat. The creation of a pen especially arranged to reduce pastures in the dunal zones and in the

Pantano area, proved to be a necessary line of intervention, but does not prevent the shepherds from setting on fire the pastures at the and of the season.

Fire control is considered crucial in order to preserve the Sicilian pond turtle *(Emys trinacris).*

The establishment of a monitoring service and the future implementation of fire prevention watch towers are the first positive actions towards the resolution of this problem.

As specified in the ONR Regulation of Torre Salsa, it is desirable that the implementation of a fire prevention plan in accordance with the relevant authorities (first of all the Regional Forestry Corps) does not only take into account the monitoring, but also possible preventive actions in order to preserve the relictual habitats within the Torre Salsa ONR and the adjacent areas.

Moreover, the disturbance caused by the fires serves as a front for illegal poaching (most of all for wild rabbits) and at the same time is a source of stress for wild species, such as the increase of the illnesses suffered by wild rabbits.

5. MANAGEMENT PURPOSES

Careful and deep analysis, aimed at good management choices, have been carried out on the Torre Salsa ONR even before its creation.

Sortino (2001), considering the vulnerability of the different Torre Salsa ONR sites, indicated that all the management actions should aim at:

- redirecting and reconverting potential production through the integration of new and traditional technologies;
- boosting both the non food production and the sustainable forestry development;
- diversifying the activities in order to develop complementary activities;
- maintaining and enhancing the social fabric crucial for the whole reserve area;
- improving the working and living conditions;
- maintaining and promoting agricultural systems with low intermediate consumption;
- defending and promoting a high environmental value and a sustainable agriculture respecting environmental needs.

The Sortino's analysis (2001) contained the proposal of focusing the Torre Salsa ONR management on one hand on the "*total protection of all the sites that for different evident reasons must be preserved in their entirety and, on the other hand, on the destination of the remaining part of the territory on productive models aimed at an endogenous economic development as referred to in Art. 29 of the Regional Law 14/88*".

5.1. GENERAL PURPOSE

The general purpose of this Management Plan is inspired by the European Landscape Convention and by the Community Directives no. 92/43/EEC (Habitats) and No 79/409/EEC (Birds), by the EU to sustain and promote the environmental policies aimed at the creation of the Natura 2000 Network.

In particular, this Management Plan followed the indications contained in:

the Natura 2000 sites management Guidelines (Official Journal No 224 of 24 September 2002, Decree of 3 September 2002 of the *Ministero dell'ambiente e della tutela del territorio* -Italian ministry of environment and land protection-);

the Natura 2000 sites management Manual, produced in the context of the LIFE project 99/NAT/IT/006279 "Verifica della Rete Natura 2000 In Italia e Modelli di Gestione" (Verification of the Natura 2000 Network in Italy and Management Models) according to which the Nature Protection Direction of the Ministry of Environment is the beneficiary and WWF Italia ONLUS is the subcontractor responsible for the drawing of this Plan;

The general purpose of the Torre Salsa ONR Management Plan is that of ensuring the protection of both the habitats and those vegetal and animal species with communitarian interest, whatever their level of priority, according to the Habitats Directive (92/43/EEC) and the national and regional interest. This purpose is to be pursued by due management actions focused on the maintenance and/or the restoration of the ecological balance of those habitats and species so essential for their protection.

The preservation and promotion of cultivations preserving and maintaining the environmental features of the area make part of the general purpose.

To reach the purpose it is necessary for the human activities affecting directly and indirectly the preservation status of Torre Salsa ONR habitats and species to be consistent with the purpose itself.

The Management Plan elaborates strategies and promotes eco-compatible economic activities linked to a sustainable management of the natural environment and of its resources in order to boost the economic development of the interested area. All this is done with the aim of reorganizing the human activities of the Torre Salsa ONR safeguarding the biodiversity.

The mentioned actions have been included in the Management Plan according to the results of the analysis of the basic data. These studies have been the bases of the proposal phase of the Management Plan; this phase's aim was that of spotting the best operative strategies and the actions to take in the Torre Salsa ONR management.

The strategy pursued in the process of identification of the actions necessary for the Plan has been that of reducing the impact of those elements that presently do not respect the best conditions of biodiversity and of those that constitute a potential threat to species and habitats. Ecologically, socially and economically sustainable management of human activities has been pursued to achieve this result both inside the Torre Salsa ONR and in the surrounding areas: in the first case through an appropriate setting of the human activities modalities; in the second case through the identification of appropriate guidelines for the different categories of land use addressed at the local authorities in consistence with the planning tools in force.

The mentioned general objectives have to be considered as guidelines for the preservation of the natural and semi-natural heritage of the area.

5.2. OPERATIVE OBJECTIVES OF ECOLOGICAL SUSTAINABILITY (see ANNEX 4A-E)

For a correct management of the Torre Salsa ONR, it is necessary to define and implementation of appropriate preservation actions aimed at:

- maintaining and preserving the biodiversity;
- the sustainable use of its components;
- reducing the causes of decay and decline of species and habitats.

In the socio-economic context the management strategy for the environmental preservation of the Torre Salsa ONR must primary aim at:

- reducing the risks of altering traditional agricultural landscape and natural biotopes (and in particular those related to the dune system);
- making the ONR a fundamental instrument for implementing and stimulating valid and incisive actions of economic development whose results have to be achieved in a relatively short time and must contribute to the increase of the employment stability (with employment period not shorter then one year);
- improving the preservation of the coastal biotopes;
- increasing the biodiversity of the coastal woods;
- to link the enjoyment of the natural goods with that of the archaeological ones of the Eraclea Minoa area, by creating a connection between the Siciliana and Montallegro municipalities.

From a more general analysis of the socio-economic system emerged suggestions and expectations that have been addressed by the Management Plan.

The protection of the natural resources and of the ecological integrity inside the Torre Salsa ONR implies:

- the maintenance and improvement of the habitats and species biodiversity, of the landscape and of all the values that made this area a Natural Oriented Reserve;
- the maintenance and restoration of the biological balances founding the natural processes (both ecological and evolutionary);
- the reduction of the causes of rare or menaced species decrease and the reduction of those factors causing the loss or fragmentation of habitats inside the site and in the surrounding areas;
- the control and limitation of those activities affecting the ecological integrity of the ecosystem;
- the reconciliation of plans and projects made in the interested territory;
- the identification and implementation of the processes necessary to promote economic activities eco-compatible with the preservation objectives of the area;
- the implementation of socio-political and administrative procedures necessary to manage actively and consistently the Torre Salsa ONR.

The consequence of this is that the operative objectives of ecological sustainability are directly or indirectly concerned with socio-economic and human activities related aspects.

That is why in the drawing phase of the Management Plan was necessary to set socio-economic sustainability objectives functional to the ecological sustainability ones.

5.2.1. OPERATIVE OBJECTIVES IN THE SHORT AND MEDIUM TERM

The objectives to be reached through the Management Plan of the Torre Salsa ONR in the short and medium term are the following:

- Preserving habitats with high priority interest (according to the Directive 92/43/EEC) and the typical species of the area with particular interest to the high priority ones;
- protecting the fresh water environments and their typical species;
- maintaining and preservation of the ecological values by a gradual reduction of the anthropic activities inconsistent with the protection objectives;

5.2.2. OPERATIVE OBJECTIVES IN THE LONG TERM

The operative objectives related to the ecological sustainability to be reached in the long term are:

- involving the local communities (above all farmers and shepherds) in the protection and preservation of the environment and of the natural heritage of the area (fresh water environments, Halocnemum strobilaceum grooves, pond turtles, sea turtles, etc.);
- involving the local authorities in the improvement of the Torre Salsa ONR for tourist and preservation purposes;
- managing in an eco-compatible way the agricultural and pastoral activities of the internal and external areas of the Torre Salsa ONR;

- safeguarding the biological connection of the Torre Salsa ONR with other natural areas (even if not protected) enhancing the maintenance of ecological networks;
- regulating the use of the Torre Salsa ONR area in accordance with the preservation emergencies identified on the territory.

5.3. OPERATIVE OBJECTIVES OF SOCIO-ECONOMIC SUSTAINABILITY

The protection of the biodiversity of a certain territory is possible only if all the public and private actors of that territory share the protection objectives. This is particularly true in those areas where do not exist specific limits and regulations for the biodiversity protection as in parks and reserves, but where the protection can be achieved through appropriate management activities of all the interested parties.

To identify the management criteria for achieving the ecological sustainability objectives some change of the previous adopted management practices is often necessary. These new practices need to be accepted and sheared by everyone acting on the territory. To this purpose it is possible to identify operative objectives of socio-economic sustainability functional to those of ecological sustainability such as those linked to the development of local products or tourist activities capable of creating income for the local actors.

Successful environment preservation, resource renewability and durable development will depend on a correct implementation of the planning and area management tools.

In this context policies of active preservation of the area and surrounding territories will have positive effects both from an economic and an occupational point of view. The protection of the environment and the landscape, in fact, can be the main resource for the environmental heritage and this is a source of direct and indirect economical benefits for the local population using that heritage and having a shared preservation awareness.

5.3.1. OPERATIVE OBJECTIVES IN THE SHORT AND MEDIUM TERM

The following short and medium term socio-economic sustainability objectives have been identified:

- promotion of quality tourism through the insertion of the Torre Salsa ONR in the list of valuable sites of the Province of Agrigento;
- a sectoral and general information campaign on the Torre Salsa ONR, its purposes and its socio-economic benefits;
- promotion of synergies with other local initiatives for the improvement of the naturalistic and archaeological resources of the area;
- creation of cooperatives and consortia among farmers to emphasize traditional products (creation of a logo for the agricultural products of "Torre Salsa") and/or the traditional farming activities with an emphasis on the biological (yet existing) biodynamic technique; assisting the agricultural operators in implementing conservative and innovative actions;
- improvement of the area visibility both at national and international level;
- diversification and implementation of a controlled use of the site;
- production of information and guidelines on the use in order to increase a sustainable tourism and limit the dangerous behaviours;

- promotion of socio-economic sustainable initiatives both inside the area and in the adjacent territories in cooperation with local communities and properties;
- promotion of traditional and biological farm productions (such as olive oil and table grapes);
- the implementation of an information campaign aimed at the owners of disharmonious or abandoned rural buildings explaining the available restoration opportunities and the planning, together with the local authorities, of the allowable types of decorative and functional changes;
- the planning, together with the local authorities and the productive categories (of the farm and tourist sectors), of actions (compatible with the Torre Salsa ONR) aimed at the population and above all at the young for the improvement of the occupational situation.
- the creation, in cooperation with local authorities and organizations (such as cooperatives, semi-public companies, etc.), of facilities (information centres, museums, paths, didactic centres, etc.) improving the use of the natural, historic and cultural environment of the area;
- the enhancing of the tourist use of the area with emphasis on agritourism activities among the farm operators of the area as a form of complementary income;
- the creation of cooperatives of young people for managing and developing new forms of sport and naturalistic tourism;
- the enhancing of the services sector for the improvement of the local natural heritage (possible services: support for eco-tourists, naturalistic guides, bird-watching facilities, path and bicycle paths maintenance, etc.)
- the enhancing of traditional cultivations conservation (in order to reduce the countryside decay);
- the enhancing of biological and biodynamic cultivations (for agricultural firms in difficulty);
- the conversion (even if done without abandoning traditional farm activities) of applying firms into agritourism farms;
- identification of macroactions to achieve better economic results at a local level through sustainable tourism activities;
- elaboration of guidelines for a correct use of the naturalistic heritage and of the landscape (sustainable tourism).

5.3.2. OPERATIVE OBJECTIVES IN THE LONG TERM

The long term operative objectives of the Management Plan of Torre Salsa ONR are aimed at:

- a sustainable management of the site territory through the sharing and cooperation of the surrounding areas;
- improving the Torre Salsa ONR area and making it a booster for new forms of economic and social development in consistence with the biodiversity and the natural, historic-archaeological and cultural resources protection;
- creating a local community awareness of the Torre Salsa ONR protection through the economic benefits coming from a correct use of the site.

5.4. ZONING

The division into an A zone (reserve) and B zone (pre-reserve) is determined by the Regulation in force and it is illustrated in the map. The maps show also the new area definition proposed by the Agrigento Provincial Authority in accordance with the managing organization, the CPS (the Provincial Scientific Council), the Sicily Regional Authority and still in discussion.

6 THE MANAGEMENT STRATEGY

6.1. STRATEGY FOR ENVIRONMENTAL SUSTAINABLITY

As illustrated in the previous chapter, having identified the general objective of the Management Plan, the specific operational objectives were defined for the ONR of Torre Salsa, divided according to the time necessary to achieve them (in the short/medium term, in the long term).

Defining these objectives serves to define the management strategies to adopt, depending on the threats which have been discovered and illustrated in the previous paragraphs.

Within this framework, the management strategy must be essentially aimed at maintaining and improving biodiversity (general objective) by preserving the habitats and species of naturalistic interest found in the area of the ONR of Torre Salsa. The general objective can plausibly be reached through the specific operational objectives.

The following is a description of those strategies aimed at promoting activities that are compatible with the need to preserve the site which, favouring the employment development in the area, would not jeopardise its naturalistic value and the environmental assets found there. More specifically, consideration was given to the economic sectors related to agriculture, pasture activities and the tertiary sector.

As regards the sector related to agricultural activities, the following strategic lines were outlined:

- Reassuring farmers that traditional crops will be maintained;
- Foster the dissemination of widespread forms of farmhouse holidays among managers operating in the area of the ONR of Torre Salsa.
- Encourage the creation of quality brands for agricultural products from the area of the ONR of Torre Salsa;

As regards the sector related to pasturing activities, the following strategic lines have emerged:

- Prepare incentive measures to keep pasturing activities and encourage the preservation of the local fauna which is at risk of extinction.

As regards the tertiary sector, the following strategic lines have emerged:

- Foster the creation of companies with a mixed public-private capital or private cooperative companies for the management of activities related to naturalistic tourism, for example:
    - land excursions;
    - support to farmhouse holiday activities;
    - sport activities suitable for protected areas;
    - didactic, educational and training activities (not necessarily of a strictly environmental nature)
- Encourage local communities to create widespread forms of tourism activities and accommodation, such as the "hotel village", which do not require a large investment or complex alteration of soils and environment but recover the living habitat already existing in the territory under examination.

- Encourage the creation of special transport companies for users of the ONR of Tore Salsa by land, rental companies for individual transport equipment (such as bicycles) and for horse tourism.
- Improve the regulated usability of the coast for tourism-bathing purposes.
- Create training mechanisms for local staff in order to give value to the available naturalistic elements: from the "didactic gym" to professional training course to the employment of actual professional figures related to the management of environmental assets.

With particular reference to the relevant habitats and species, the management strategies have been analyzed with a view to reaching the specific operational objectives.

6.1.1. MANAGEMENT STRATEGY FOR NATURALISTIC ASSETS

The strategy to manage the habitats with a valuable vegetation cover which will be pursued in order to protect and increase the consolidation of ecological communities is based on:

- favouring and maintaining the high specific biodiversity of these environments:
    - by regulating the pasturing activities in the occupied areas of the habitat;
    - maintaining and fostering agricultural practices which are compatible with the protection of biodiversity both in the area of the ONR of Torre Salsa, and in neighbouring areas (capable of affecting the environmental qualities of the site).
    - avoid the total abandonment of the pasture to limit the restarting of subsequent dynamics which would lead to the disappearance of existing habitats.

As regards the fresh and salt water environments, the management strategies which will be pursued in order to protect and increase the value of these natural environments consist in:

- avoiding the excessive anthropication of the riparian environment which causes a further reduction of the hydric vegetation strip, as well as the alteration of its structure and functionality;
- limit the presence of solid waste;
- keep a good chemical-physical and biological quality of the water, checking and monitoring the introduction of wastewater;
- keep a high level of fire prevention surveillance.

6.1.2. MANAGEMENT STRATEGY AGAINST ANTHROPIC DAMAGE

To reduce the anthropic damage in the area of the ONR of Torre Salsa it is necessary to:

- regulate anthropic access, in particular to the most sensitive areas;
- promote more control and surveillance to avoid harmful behaviours (fires) and illegal activities (poaching) within the ONR of Torre Salsa.

6.1.3. STRATEGIES FOR THE ECO-COMPATIBLE MANAGEMENT OF AGRICULTURE AND PASTURING

The management strategies for agricultural and pasturing activities are aimed at keeping and fostering practices which are compatible with the protection of biodiversity, both in the area of the

ONR of Torre Salsa and in neighbouring areas (affecting the environmental qualities of the site). Special attention, however, should be paid to the actual presence of cattle grazing both on the grass and riparian habitats, as well as to fresh and salt water environments.

The suggested strategies are based on the development of agricultural and pasturing practices of the "extensive" type, which enable to correctly manage the resources (soil, water, etc.), adequate pressure of the pasture, a limited use of chemical substances.

More specifically, the strategies which need to be adopted to keep or encourage the eco-compatible management of agriculture and pasturing are:

- favour multi-specific crop systems in order not to hinder biodiversity: this means avoiding modern single-crop agricultural practices;
- limit the use of pesticides, fertilisers and chemical substances in general, which are harmful for animal species all along the food chain;
- carry out collection operation of agricultural production using techniques, method and timing which, although they are compatible with strictly economic assessments, reduce the negative impact on the fauna; more specifically it is necessary to limit the ploughing of the fields with mechanical means which interfere with the nesting of numerous bird species present in the fields;
- avoid drastically changing the landscape (building greenhouses, fences, etc.) which lead to a fragmentation of the habitats with negative consequences both on the animal populations and on the vegetation;
- prevent excessive pasturing to avoid the selection of nitrophile plant species which are less appetising for the cattle, damaging biodiversity, and to avoid excessive compacting of the soil which could lead to erosion phenomena.

6.2. STRATEGIES FOR SOCIO-ECONOMICAL SUSTAINABILITY

The definition of the methods for the use of a sustainable tourism environment must necessarily take into account the operations structure Plan for the ONR of Torre Salsa, namely that:

- in A areas the anthropic presence must be limited;
- in B areas anthropic activities must be strictly controlled.

We wish to stress that the perimeters of Reserve Area (A) and Pre-reserve Area (B) are already defined by the regional standards in force.

Taking into account these essential pre-requisites for the correct safeguard of delicate natural balances, the possible uses can be mainly divided into four categories:

- individual tourism without own vehicles;
- collective tourism without own vehicles;
- individual tourism with own vehicles;
- collective tourism with own vehicles.

The actions presented in this Management Plan therefore serve to make all these types of tourism possible. Indeed the creation of service centres may serve as a basis for individual/collective users without vehicles, where they have a possibility of renting bicycles and horses to cross and visit the perimeter of the ONR of Torre Salsa, or they can use special means of collective transport which allow

individuals or groups to reach the relevant starting points for the expected "coastal, botanic and geological routes".

A similar transport service may connect, following specific routes, the different holiday farmhouses present in the area.

On the contrary, as regards users with their own vehicles (both individual and collective) it is necessary to strictly define the parking lots where these can be left and from which users will be able access individual rented or collected means of transport.

To these parking areas, one can also add the private lots, for example the one which is part of the Torre Salsa holiday farmhouse area.

Of course, among the topics for discussion which can be agreed with the administrations of Siculiana and Montallegro one should also consider the creation of equipped parking areas near the historic centres of the two boroughs in order to integrate naturalistic tourism with cultural, gastronomic, ethnographic aspects, etc. In any case, the historic centres of the two villages could act as centres of balance for new forms of tourism, such as the "hotel village" mentioned above or the "widespread hotel", that is to say tourist accommodation in houses that are not used very much or made available by the inhabitants themselves as "bed and breakfast" or small hotel (suitably restructured for the purpose). This should be done in order to avoid an increase in the volume of built-up sections in the area in question and to allow for a division of the income derived from the tourism activity among substantial sections of the resident population.

In line with the general objectives of the Management Plan and with a view to harmonising and integrating the activities related to the management and use of the area with measures and interventions aimed at safeguarding the habitats and species, the following strategic lines have been defined:

- Use;
- Control and surveillance;
- Communication and awareness raising;
- Management of pre-existing infrastructures;
- Production activities

USE

The use of the ONR area of Torre Salsa is already regulated by a specific provision(Decree of 23 June 2000 of the Sicilian Regional Government).

The area of the ONR Torre Salsa, even though it is well-known on an international level, especially because of the WWF activity, is not very well known for its belonging to the Network Natura 2000 and for the naturalistic assets of a European value it contains. It is therefore necessary to activate public awareness-raising strategies aimed at increasing the use/knowledge of the area, respecting the acceptable tourism load. Specific attention will have to be paid to the assessment of the maximum load of visitors which the environmental components might support.

The Management Plan suggests that this result, necessary for better knowledge and use of the area and therefore increased sharing and dissemination (in the long term) on environmental protection objectives, can be achieved through:

- extension of the promotion of the ONR of Torre Salsa also as Community-Relevant Site (SIC) and of its belonging to the Network 2000 in schools, local government bodies, tourism agencies present in neighbouring areas;

- increase of the national and international renown of the area and its introduction, with all due care, as part of sustainable eco-tourism initiatives;
- improvement and diversification of the ways to use the area.

CONTROL AND SURVEILLANCE

In the area there is a surveillance service consisting of four operational units which carry out activities aimed at complying with the regulation in force.

As regards perimeter surveillance, this is agreed upon with the Corpo Forestale Regionale, the Arma dei Carabinieri, and other authorities with a view to setting up suitable synergies to increase surveillance of the ONR of Torre Salsa and neighbouring areas.

COMMUNICATION AND AWARENESS-RAISING

The tools for the communication and activation of synergies with local bodies and actors are particularly important elements which, in the long term, can lead to effective protection action of the ONR of Torre Salsa.

Communication, indeed, disseminates knowledge, awareness, consensus and support (also economically) to protect the area in question.

Among communication tools, mention should be made of:

- an executive project for notice boards and didactic panels in the area with a view to raising awareness among the general public as regards conservation issues;
- the implementation and allocation of notice boards and didactic panels;
- the regular updating of the website about the reserve: www.wwftorresalsa.it
- the publishing of an information brochure
- the drafting of a strategic communication plan for local involvement and, more specifically, for the involvement of the social categories affected.

The objectives which the communication Plan should achieve in this respect are:

- Improvement and integration of communication;
- Promotion of concertation forms.

The communication is targeted both to visitors to the area, individuals or groups who intend to visit it, and to bodies, institutions and association with which common programmes and action can be starter with a view to giving value to the resources and sustainable development of the ONR of Torre Salsa and the surrounding territory.

As regards the synergy actions to be promoted and started, on-going concertation is essential with the different operators in the area. It will therefore be necessary to encourage and/or strengthen:

- synergies centred around eco-tourism activities, farmhouse holidays, giving value and promoting local cultural assets;
- strategies aimed at protecting and giving value to resources in cooperation with cultural bodies, research institutes, local government authorities, etc, in order to create integrated routes of a naturalistic-historic-cultural type.

MANAGEMENT OF PRE-EXISTING INFRASTRUCTURES

As regards accessibility and internal transport within the area of the ONR of Torre Salsa, the management shall have to be based on the following criteria:

- differentiation of the routes by type (free access, guided tours, etc.), area of interest, optimal period for use, through appropriate signposting;
- re-qualification of current paths in some section, to obtain greater diversification routes and habitats crosses, better accessibility for the disabled and a reduced impact on species and habitats;
- differentiation of the routes for surveillance, management and maintenance activities of paths and structures, scientific research.

PRODUCTION ACTIVITIES

In the long run, by encouraging agricultural activities present in the area which is part of the ONR of Torre Salsa, both in the reserve and pre-reserve area, it will be necessary to propose, through suitable information campaigns among professionals in the sector, the shift to cultivation methods which are more respectful of natural trends (organic farming, etc.)..

Also the reduction in the use of chemical fertilisers and weed-killers should hopefully contribute to having an organic farming which does not damage the habitats it comes into contact with. Such policy should be pursued by means of a suitable awareness-raising and information campaign, as well as with a system of incentives and/or indemnification by the bodies in charge.

These initiatives could also result from the marketing, within the area of the ONR of Torre Salsa, of organic products with protected or controlled denomination of origin (PDO or CDO).

Local producers, following letters of intent with institutions and managers in the area, could also be involved in supra-regional initiatives such as the "Fattorie del Panda" and "Valore Natura".

7. ACTIONS AND INTERVENTIONS

The on-going actions at the ONR of Torre Salsa, carried out by the Management Body as regards routine management, involve the following fields of action:

- Conservation
- Surveillance
- Environmental education
- Use
- Promotion
- Scientific research
- Cleaning, waste collection and disposal

On 20 January 2006, the President of the Sicilian Regional Government, the General Manager of DTA, the Inspector General of the Azienda Foreste Demaniali, the President of the Messina Provincial Government, the legal representative of LIPU and the legal representative of WWF, undersigned the PIR RES Programme Agreement for the "Marine-Coastal" Integrated Natural System with a view to setting up infrastructures for the environment and re-functionalisation of the widespread social heritage "mentioned in Measure 1.11 of the Complemento di Programmazione POR Sicilia 2000-2006.

Subsequently WWF Italia, for the implementation of the actions approved and financed, undersigned agreements with the Agrigento Provincial Government, the Municipality of Siciliana and the Azienda Foreste Demaniali.

Among the projects to be implemented, the following activities are being assessed and discussed as part of the use of PIR financing for an overall amount of about € 460,000 for the descript actions:

- With the Agrigento Provincial Government:

- "Acquisitions" which involve the acquisitions by the regional government of the dune habitat, of the juniper habitat, of dismissed quarries and of the area related to the visitor centre "casello Omomorto" (estimated cost: € 110,000)
- "Visitor centre casello Omomorto" which involves the maintenance of the structure and of the related areas as well as internal furnishing (estimated cost € 50,000);
- "Roccioteca" which involves the finding of emerging lithologies, their macroscopic and microscopic analysis, the design and planning of didactic-description board to be placed inside the visitor centre and along the nature trail of the reserve, as well as the setting up along the nature trail of an exhibition displaying the most significant rock samples (estimated cost: € 50,000);
- "Geosite valorisation" which involves the geological and geomorphologic measurement of the reserve territory (estimated cost: € 20,000).

- With the Municipality of Siculiana:

- "Tower and Pantano" recovery which involves the acquisition of the wetland area included between the Salso stream and the road between the fields which leads to the sea, the cleaning of the riverbed, the repair (extraordinary maintenance) of what is now a dirt-road which limits the wetland section of the cultivated land, the construction of a fence along the road, with wooden

poles to section off and protect the wetland, the construction of a small plant treatment system in the section of the stream near the entrance to the reserve (estimated cost: € 160,000).

- "New nature path" which involves the extraordinary maintenance of the path which goes from Monte Cupolone to the Cannicella road, the repair of an existing wall section, partly demolished, and the repair of a retention wall section of a gypsum "Calcarella", the installation of didactic-information boards (estimated cost: € 30,000);

- With the Azienda Foreste Demaniali for the implementation of the following projects:

- "Fire-control tower" which involves the acquisition by voluntary transfer, of the area where the intention is to build a pre-fabricated fire-prevention tower made of wood, the toilets and wooden staircase to reach the site (estimated cost: € 50.000)
- "Autochthonous species greenhouse" which involves finding the species for reproduction, the collection of seeds and cuttings in the area of the reserve, their reproduction in the greenhouse of the Azienda Foreste Demaniali in Borgo Monsignore and all the necessary greenhouse species (estimated cost: € 30,000).

The implementation of these projects, which are pending the necessary authorisations will allow the reserve to make substantial progress in the direction of conservation and strengthening of the infrastructures necessary for its use.

The three separate summary tables illustrate interventions in the short, medium and long term.

The short-term interventions refer to the Programme Report for the year 2007 presented by the Management Body, WWF Italia, to the Agrigento Provincial Government.

The medium-term interventions refer to the list of planned expenses for strategic actions which the Management Body has suggested to the regional and provincial bodies in charge.

As regards the summary table related to medium-term interventions, this Management Plan outlines a series of suggestions along the lines of those presented during the international conference "Policies and instruments for landscape management and sustainable development" held in Agrigento on 12-13 July 2007. These include:

- Re-activation of the railway route in front of the ONR of Torre Salsa to give value to the area;
- Activation of a shuttle service from Montallegro and Siculiana;
- An agreement protocol between the Agrigento Provincial Government, Provveditorato degli Studi di Agrigento, University of Palermo and Management Body of the ONR of Torre Salsa for university and pre-university training (credits);
- The setting up of a buoy park in front of the coastline, in agreement with the Capitaneria di Porto di Porto Empedocle (AG);
- The purchase of a boat (dinghy) with an electric motor to be used in the area in front of the water at the ONR of Torre Salsa;
- The setting up of a picnic area in the pre-reserve section
- The provision of toilets for the Oasi structure (for men/women/disabled)

7.1. ACTIONS RELATED TO CONSERVATION

- Continuing the activity aimed at defining priority areas for the recovery of the dune system through fencing with a view to reducing the damage caused by sheep grazing (pilot action activated through LIFE 99/NAT/IT/6275)
- Activate an organic and integrated management among all local actors in charge of safeguarding the wetland systems (pilot action started through LIFE 99/NAT/IT/6275)
- Re-qualify the vegetation strips casmophyte and psammophyte
- Gradually eliminate exotic species (eucalyptus, etc.).
- Give value and maintain traditional agricultural practices in order to preserve semi-natural environments
- Work for the fine-tuning of a fire-prevention vigilance system
- Look for funds for beach reclamation and for pre-summer cleaning of the latter, excluding mechanical removal interventions.
- *Activate widespread information initiatives* in the area to give value to the natural heritage within a European perspective (Natura 2000, new CAP, Structural Funds, POR 2007-2013).
- An agreement protocol between research institutes and the Management Body to start monitoring the conservation of the habitats and Community-, nationally and regionally relevant species (*Caretta caretta*, etc.) found in the area.

7.2. ACTIONS TARGETED TOWARDS THE SAFETY OF VISITORS AND RESIDENTS

- *Fence off* and suitably signpost, informing about the potential danger, the coastal strip to the west and east of the *Monte Stella landslide*;
- *Prohibit transit along the cart road on the eastern side of M. Eremita* until the work has been completed for the laying of a protection net against sliding of the slopes above.

7.3. ACTIONS AIMED AT SOCIO-ECONOMIC PROMOTION

- *Search for* possibilities to access *Community, national and regional funds* for the implementation of conservation and development objectives in agreement with municipal and provincial councils;
- *Set up a management committee ("forum")* with the municipal councils of Siculiana and Montallegro, as well as with the Agrigento Provincial Government to draft projects and preparatory actions for socio-economic development compatible with the preservation of the natural environment; similar forum with business associations in the agricultural and tourism sector;
- *Search for methods and times to acquire buildings to be used to host the various centres of the Management Body*, carrying out project, financing and tender procedures.

7.4. ACTIONS AIMED AT REMOVING NON-COMPATIBLE ANTHROPIC ACTIONS

Among the most valuable action in terms of conservation, specifically to maintain the reason for the site's existence, mention should be made of:

- Outlining priority areas for the recovery of the dune system through fencing (action partly carried out through LIFE 99/NAT/IT/6275)
- the restoring and organic management of the wetland systems (Pantano area) (action partly carried out through LIFE 99/NAT/IT/6275)
- re-qualification of the casmophyte and psammophyte vegetation strips
- gradual elimination of exotic species (eucalyptus, etc.) and control of invasive plant species.
- Vegetation uprooting and replacement activity
- Giving value to and preserving eco-compatible activities
- Fine-tuning a fire-prevention system through a surveillance service and the installation of fire-control towers
- drafting and starting of a Fire Prevention plan (in collaboration with the Corpo Forestale Regionale)
- the reclamation of the beach and pre-summer cleaning of the latter, excluding mechanical removal interventions
- analytic elaboration of the hydro-geological structure of the ONR of Torre Salsa with a view to preventing any hydro-geological unbalances in the area.
- Information activities on protected area rule;
- Sensibilization activities on the importance of the site.

8. ACTION PLANNING AND COST ASSESSMENT

8.1. OPERATION AND ROUTINE MANAGEMENT EXPENSES

Expenditure items	Description	Estimate (in €)
1	Renting rooms and other leasing costs	6,000.00
2	Routine maintenance, repair and adjustment of standard systems	1,000.00
3	Expenses for telephone, water, electricity, insurance, etc. bills and installations	4,500.00
4	Furniture and technical equipment, software purchase and maintenance	2,000.00
5	Postal expenses	500.00
6	Purchase of easy consumption material, maintenance and rental of technical equipment	3,545.69
7	Staff clothing and equipment	4,500.00
8	Cleaning service (offices and reserve)	3,000.00
9	Means of transport maintenance, rental and operation	15,500.00
10	Maintenance interventions on infrastructures for use-related activities (signposting, footpaths, equipped areas and visitor centres)	7,500.00
11	Overheads and unexpected expenses	3,600.00
Total		***51,645.69***

8.2. STRATEGIC ACTIONS

8.2.1. RESEARCH, STUDY AND CONSULTING

Decreasing priority	Description	Estimate (in €)
1	Study on the planning of anthropic activities for a compatible development plan inside the reserve	**20,000.00**
2	Scientific consultancy for the study drafted by Prof. M. Lo Valvo of DBA at the Università degli Studi di Palermo and the census of the entomofauna with special reference to the census and biology of rare and/or threatened species	**7,500.00**
3	Study on the plant species *Ammi crinitum* Guss through field research and comparison with various herbaria and literature on the subject, in particular with the herbarium and manuscript of the botanist Gussone found in Naples and publication of the research results	**5,000.00**
4	Census and presentation of all the studies and scientific research currently carried out within the Natural Reserves. Organise technical workshops for the training of staff directly involved in scientific studies in natural reserves. Prepare a research and monitoring protocol on bioversity to be applied in natural reserves managed by WWF	**3,500.00**

8.2.2. ILLUSTRATION AND DIVULGATION MATERIAL

Decreasing priority	Description	Estimate (in €)
1	Re-print of the guide to the flora in the reserve with its integrations and updates	**15,000.00**
2	Contribution to print the volume "Le aree carsiche nei gessi della Sicilia"	**2,500.00**
3	Production of promotional placards and posters	**3,000.00**
4	Production of a video for didactic and promotional activities	**15,000.00**
5	Share for divulgation material common to reserves managed by WWF in Sicily	**2,500.00**
6	Production of a series of movable exhibition functional for the purpose of an information space on biodiversity and eco-regional conservation.	**2,500.00**
7	Production of a publication on data collected from sea turtles of the *Caretta caretta* species and/or on the Sicilian swamp turtle *Emys trynacris.*	**6,000.00**

8.2.3. AGREEMENT WITH THIRD PARTIES FOR MANAGEMENT SERVICES

Decreasing priority	Description	Estimate (in €)
1	Organization of voluntary work periods	**5,000.00**
2	Participation in national and international fairs for the promotion of natural heritage, typical products and tourist routes	**8,000.00**
3	Support to guided tour and visitor centre management activities	**4,000.00**

8.2.4. INFRASTRUCTURING INTERVENTIONS FOR USE-RELATED ACTIVITIES

Decreasing priority	Description	Estimate (in €)
1	Signpost purchases (road signs, information, didactic, no hunting signs, etc	**10,000.00**
2	Creation of a didactic route on the gessi	**20,000.00**
3	Creation of a path for the disabled, about 1000 m long	**20,000.00**
4	Construction of gangways and infrastructures guaranteeing access to the sea for the disabled at the mouth of the river Salso	**15,000.00**
5	Construction of 2 toilets on land property of WWF for use by visitors to the reserve	**10,000.00**
6	Dirt-road maintenance inside the reserve	**10,000.00**
7	Replacement of the current concrete bridge to cross the Salso streams which seriously restricts the water bed with a bridge that has a single span made of iron or other material	**60,000.00**

8.2.5. INTERVENTIONS FOR CONSERVATION AND PROTECTION PURPOSES

Decreasing priority	Description	Estimate (in €)
1	Construction of new fences to protect particularly vulnerable areas	**10,000.00**
2	Continuation of the setting of buoys at sea to define and signpost the water stretch in front of the reserve protected by the Capitaneria di Porto of Porto Empedocle and to define the corridors through which the boats reach the beach; fencing (on government-owned land) with poles and metal net of the beach section subject to slides between the reserve and Siculiana Marina; construction of a wooden fence on the beach along the west border of the reserve to mark its boundaries.	**30,000.00**
3	Reclamation work on the dismissed quarries of Monte Cupolone and in areas that are prime habitats within the reserve area (A) through re-naturalisation and naturalistic engineering work using local germoplasm.	**80,000.00**

8.2.6. STAFF TRAINING

Decreasing priority	Description	Estimate (in €)
1	Training courses and periods for the staff related to: use, environmental education, surveillance activities, environmental legislation, naturalistic knowledge, biodiversity and eco-regional conservation, computer skills, foreign languages, safety on the workplace norms, fire prevention, first aid, etc	**6,000.00**
2	Purchase of reference material. Purchase of scientific texts for the updating of staff and for the naturalistic reserve to be used by visitors and students currently located in the offices of the Management Body.	**4,000.00**

8.2.7. AREA ACQUISITIONS

The dispossession plan is being drafted by the Forestry Department Inspectorate of Agrigento

Decreasing priority	Description	Estimate (in €)
1	Acquisition of the areas affected by interventions from the Management Body	**50,000.00**
2	Acquisition of the areas with a high naturalistic relevance and/or vulnerability	**80,000.00**
3	Acquisition of houses and tower "Pantano"	**80,000.00**
4	Acquisition of remains and surrounding land to construct the fire-prevention tower	**20,000.00**

8.2.8. PURCHASE OF EQUIPMENT, EMERGENCY SYSTEMS, MISCELLANEOUS

Decreasing priority	Description	Estimate (in €)
1	Purchase of second new service car Panda 4x4	**18.000,00**
2	Purchase of fire-prevention gear and equipment (goggles and smoke masks, gloves, anti-heat boots, fire-resistant clothing, fire-beating flabella, etc)	**3.000,00**
3	Purchase of a boat for the management of the beach and sea section in front of the reserve, or alternatively rental of the latter	**15.000,00**
4	Contributions for farms which continue growing traditional crops, use organic techniques or are switching to organic techniques, according to art. 6 of the reserve regulation.	**5.000,00**

9. STATUS INDICATORS

The set of indicators outlined for the management of the ONR of Torre Salsa is at the basis of a monitoring programme to be implemented according to a schedule to be defined.

As an indication, the measurements for conservation purposes of species and habitats with Community relevance need to be carried out annually.

The measurements of a socio-economic nature, as an indication, need to be carried out every three years.

The analysis of the effects of the interaction between humans and the environment, over the past few years, has availed itself of a set of conceptual tools where indicators are an excellent instrument for immediate use.

Any indicator, both qualitative and quantitative, has a standard in space as point of reference (observation and/or complete measurement on a sample site taken as a model) and in time (observation on time zero which generally corresponds to the data measured at the beginning of a survey). For management and conservation purpose of habitats and species, therefore, the space and/or time comparison (variations in the course of time) of the different indicators provides for a measurement of the environmental "health condition".

9.1. THE MATTM INDICATORS

The Italian Ministry for the Environment and Protection of the Territory and Sea (MATTM) has outlined seven groups of indicators as regards the management of Natura 2000 sites, which are also applicable to marine and coastal habitats types. They include:

- The territorial mosaic
- The flora and vegetation structure
- The forestry structure
- The fauna structure
- The hydro biological structure
- The disturbance and environmental alteration factors
- The socio-economic structure

According to the MATTM, the use of suitable indicators to measure the management status of Natura 2000 sites, should meet two essential requirements for information, namely:

- whether the surface occupied by the habitat or the size of the species populations are stable (in other words, no significant comparative variations should be seen during the monitoring activities planned as part of the management activities)
- whether the specific structure and functions necessary for the long-term support of the habitat/species are present and whether their presence is foreseeable in the medium-long term.

The "Manual for the Drafting of Management Plans for Natura 2000 sites", drafted by MATTM, in collaboration with scientific societies (AISF, SBI, UZI, SItE) and the main environmental associations (CTS, WWF, LIPU and Legambiente), as part of the Project LIFE Natura 1999 NAT/IT/006279 "Testing the Natura 2000 network in Italy and management models", lists a series of about twenty types of habitat, for each of which an indication is given as to indicators, threats, problems and management trends. For the purposes of this action plan, information has been drawn as to the following typologies:

- sites dominated by Mediterranean bush
- sites dominated by Mediterranean pinewoods
- sites dominated by low coastlines
- sites dominated by high coastlines
- sites dominated by consolidated dunes
- sites dominated by prairies of *Posidonia oceanica.*

Indicators suggested by MATTM by habitat type according to the Directive 92/43/EEC

Sites dominated by Mediterranean bush

- High values of biomass and structural complexity and a continuous forest coverage (>70%);
- For insects, specialised litophage species;
- For birds, structured communities which include, apart from Sparrows typical of the bush, Coraciiformes, Columbidae and Picidae;
- For mammals, porcupine and autochthonous populations of roe deer.

Sites dominated by Mediterranean pinewoods

- Spontaneous renewal in abandoned phytocenosis;
- Continuous forest coverage (more than 70%), a good representation of all diameter classes; the capability for renewal (with seed coverage >1%, in a mature elementary population), the presence also of young trees;
- For insects, the presence of specialised phytophagous xilophagous species *(Coleoptera Buprestidae, Cerambycidae, Hymenoptera Symphyta, etc.);*
- For mammals, marten and wild cat;
- For birds, the presence of stock dove, goatsucker and, locally, of Picidae is noted.

Sites dominated by low coastlines

- Persistence of the waters and their quality, with reference to a low load of pollutants and suspended matter.
- Annual cycles of the salinity gradient;
- For birds, communities with a high degree of structural complexity, both during the nesting and wintering period;
- For fish, the presence of the tooth carp *Aphanius fasciatus*;
- For invertebrates, extended bentonic formations with *Cerastoderma* and complex macro-bentonic communities with Crustaceans and Platelmints.

Sites dominated by consolidated dunes

- the presence of the different types of herbaceous vegetation in the moving dune;
- the presence of wood vegetation behind the dune, especially of a forest type;
- the good structuring of the communities and the extension of the latter;
- the morphological features of the different dune cordons (height, continuity, distance from the sea, etc.);
- the presence of reptile chelone communities (Emidides and Testudinates) and Coraciformae birds;

- For mammals, the presence of porcupines;
- For insects, the presence of specialised insects such as *Hymenoptera, Coleoptera (Tenebrionidae, Scarabaeidae, Carabidae and Cicindelidae);*
- the presence of very interesting endemites;
- the nesting of birds such as plovers and during the passage or wintering the stopping of extended laro-limicole communities, especially in the presence of bogs and ponds behind the dunes;
- the presence of riparian communities of Amphipod crustaceans.

Sites dominated by high coastlines

- The presence of highly specialised alotollerant rock species;
- For birds, communities nesting on cliffs;

Sites dominated by prairies of *Posidonia oceanica*

- Biological wealth of animal and plant species;
- Continuity of the cover.

9.2. THE IUCN INDICATORS

The IUCN has outlined three groups of indicators as regards the management of marine and coastal areas on a different protection level: indicators of the conservation status of species and coastal and marine habitats, socio-economic indicators, *governance* indicators.

These three groups of indicators outlined by the IUCN as regards the management of marine and coastal areas on a different protection level are listed below and adapted to the marine-coastal environment of the ONR of Torre Salsa:

Indicators of the conservation status of species and marine and coastal habitats

Number of interesting animal and plant species (abundance of focal species, etc)
Population structure of interesting animal and plant species (population structure of focal species, density, etc)
Distribution and complexity of the habitats
Composition and structure of the ecological communities
Capability to recover of ecological communities (when faced with disturbances, stresses, etc).
Integrity of the trophic networks (presence of top predators, etc)
Typology, capability to restore the balance and return times after extraction (hunting, fishing, forestry activities, etc)
Water quality (analysis of the sea water and bathing suitability, etc)
% of the surface which shows signs of recovery (when faced with a disturbance, stress, etc)
% of surface totally or partially not affected by anthropic pressure

Socio-economic indicators

- Models for the use of local biological marine and coastal resources
- Local cultural values related to the conservation of marine and coastal natural aspects
- Level of perception and understanding by residents of the effects anthropic pressures have on marine and coastal natural resources

- Degree of perception of the availability limits of fish resources (for example availability of "seafood", etc)
- Degree of perception of the intensity of natural resource extraction (on a local level)
- Degree of perception of non-tradability and no-profit values of marine and coastal assets (on a local level)
- Quality of life (on a local level)
- Quality of human health (on a local level)
- Distribution of per-capita income (on a local level)
- Employment structure (on a local level)
- Infrastructures and commercial activities (on a local level)
- Number and type of local activities
- Knowledge of the natural history of the site by local stakeholders
- Education level (locally)
- % of stakeholders in management positions (e.g.: representatives of hotel managers hunters, fishers in municipal councils, etc)
- Changes in the conservation status of geological and historic sites, of the environment characteristics and/or of monuments

Governance indicators

- Intensity of conflicts in the use of environmental resources
- Presence of a decision-making management body
- Existence and adoption of a management plan
- Local understanding of the meaning of having a marine and/or coastal area (e.g. Natura 2000 site) in terms of standards and regulations (as regards rights and duties)
- Degree of perception of the suitability of existing legislation
- Availability and allocation of resources dedicated to the management of the marine and coastal area (especially for protected areas, MPAs, SCIs and SPAs)
- Presence and application of scientific research and inputs from the academic world (example: number of studies, experimental dissertations and field research, etc.)
- Level of activity and number of local organisations (NGOs, etc)
- Degree of interaction between managers and stakeholders
- % of stakeholders in favour of the sustainable use of resources
- Number of refresher courses as regards the use and non-use of environmental resources which directly involve the stakeholders
- Level of satisfaction and involvement of stakeholders in management processes and activities
- Level of participation of stakeholders in surveillance, monitoring and application activities of the management plan
- Clearly defined procedures (as part of the management plan, urgent actions, etc)
- Completeness and extension of the range of intervention sectors (education, eco-tourism, etc)
- Degree of information dissemination to encourage the direct involvement of stakeholders

9.3. INDICATORS OF LANDSCAPE ACCORDING TO THE COMMON METHOD ADOPTED BY LANDSIBLE

- Elements which characterise the relief
- Elements which characterise the hydrograph
- Elements which characterise the plant cover
- Elements which characterise soil redressing
- Main type of crop
- Type of urbanisation
- Location of the settlement
- Use purpose
- Nature of the settlement
- Infrastructure of mobility
- Presence of monuments
- Historical design of settlements
- Historic places
- Belonging settlement systems
- Known archaeological sites
- Areas with a potential archaeological interest
- Elements which structure the environmental images: routes, borders, nodes, neighbourhoods, references
- Natural/anthropic aspects
- Wilderness
- Assessment of the visual quality by the general public
- Extension of the visual quality
- Visual depth
- Perceivability of the skyline
- General effectiveness of perception
- Visual detractor
- Degree of visual intrusion
- Distance from the new intervention
- Angle of vision
- Physical overall size of the new intervention
- Quality of the observers
- Frequency of observations
- Quality characteristics of visual intrusion
- Quality of the settlement introduction within the framework
- Variation of the overall landscape quality

9.4. PROPOSED INDICATORS FOR THE ONR OF TORRE SALSA

The following indices are presented as an integration of the MATTM and IUCN indices mentioned above, as a specific contribution within the project LANDSIBLE. To define and choose the indices presented here, the suggestions presented on the occasion of Agrigento CPS (Provincial

Scientific Council) have been approved and integrated della Provincia di Agrigento, in data 07/08/2007.

Composition of guidance phytocenosis

- Census of flora species of Community/national/regional relevance
- Conservation status of regional endemic species
- Division and dynamics of crops
- Cultivation techniques
- Ecological value of the cultivated species
- Spatial order of the cultivated areas
- Connectivity
- Circuitation

Composition of guidance zoocenosis

- Census of bird species with Community/national/regional relevance
- Population trends of bird species with Community/national/regional relevance (number of nesting pairs per species; dormitory census; migration passage census, power line impact assessment)
- Census of other species with Community/national/regional relevance (fish fauna, erpetofauna, batracofauna)
- Census of rare and/or threatened species
- Presence testing and census of allochtonous animal species
- Extension, characterization and number of sites used by Falcons (feeding areas, nesting areas, n° of stopping areas, etc.)

Quality status and use of pastures

- Pasturing surface
- Pasturing value (quality)
- Real value calculation (load assessment)
- Ratio between real and potential load
- Flora structure of the pasture
- Animal husbandry structure (sheep, buffaloes, etc) and fauna (wild rabbits, etc)

Hydro-geological and hydro-biological structure

- Measure of erosion process soil vulnerability
- Measures of hydro-geological parameters (chemico-physical, water quality)
- Measure of the water flow in natural basins
- Measure of the hydraulic vulnerability of water streams
- Biotic indices
- Updating presence/absence data through species/specific monitoring
- IBE
- IFF

Socio-economic structure

- Number of companies related to tourism and eco-compatible development.
- Number of people benefiting from naturalistic management activities in the area
- Employment created through naturalistic management

- Tourism presences per inhabitant and surface unit
- Surface used for organic farming

Anthropic impact assessment

- Reserve user assessment
- Estimate of visitors, bathers, etc
- Number of vehicles
- Number of hunters per hectare
- Duration of the hunting season
- Number of fires

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