



IMPRECO



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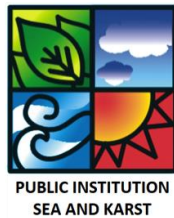
**Common strategies and best practices to IMprove the transnational
PRotection of ECOsystem integrity and services**

Deliverable T1.1.1

**Inventory and mapping of species, habitats, ecosystems,
ecosystem services**

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PRotection of ECOsystem integrity and services

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Partner responsible: PP3, University of Salento – Department of Biological and Environmental
Science and Technologies (DiSteBA)

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Table of Contents

Introduction.....	6
1. Selection of protected areas.....	7
2. Description of selected protected areas.....	7
2.1 ISONZO RIVER MOUTH NATURE RESERVE (Riserva Naturale Regionale Foce dell'Isonzo).....	7
2.2 BOSCO NORDIO NATURE RESERVE (Riserva Naturale Integrale Bosco Nordio)	10
2.3 AQUATINA DI FRIGOLE.....	11
2.4 ŠKOCJANSKI ZATOK NATURE RESERVE (Naravni rezervat Škocjanski zatok).....	13
2.5 PAKLENI ISLANDS	15
2.6 SHKODRA LAKE AND BUNA DELTA	18
2.7 NORTH-EASTERN EDGE OF CRETE.....	19
3. Global analysis of species and habitat.....	23
3.1. Species.....	23
3.2. Habitats.....	24
3.3. EcoSystems (ES) and EcoSystem Services (ESS).....	27
3.3.1. <i>Methodological approach</i>	27
3.3.2. <i>Results</i>	34
Literature	Errore. Il segnalibro non è definito.

Introduction

This deliverable offers a biodiversity baseline based on the inventory of species, habitats, ecosystems (ES) and ecosystem services (ESS) carried out by the Project Partners (PPs). PPs selected the pilot project areas (PAs) to be involved in the collection of biodiversity data and to compare biodiversity data among them. The main core of data collection was the most recent NATURA 2000 - Standard Data Form. Since the biodiversity is not limited to protected species and habitats, data collection was carried out through an analysis of the data already collected by PAs (species check lists, scientific literature, personal observations, map of habitats, historical maps, invasive alien species) and by field analysis.

EXCEL template files were set up to collect all the information on the species/habitats protected through Nature 2000 directives' (Bird Directive 2009/147/EC and Habitat Directive 92/43/EEC) and species/habitats not protected. The biodiversity templates were based on the following column: Protected area, Country, NATURA 2000 site code, NATURA 2000 name, Taxonomic group, Species name, Species name check, Natura 2000 species code, Habitat used by the species, Protection level, Alien and Reference.

The species were listed in the principal groups, Algae, Amphibians, Birds, Invertebrates, Plants, Fish, Reptiles and match with the habitat used. At the same time it was verified the presence of invasive alien species with reference to European Alien Species Information Network - EASIN Web Site. The name of the species was checked using international databases like WoRMS, Avibase, AlgaeBase, EU-NOMEN and IUCN. Data for each country and pilot project area were divided according to NATURE 2000 directives' species included in the Standard Data Form, species listed in NATURA 2000 directives' but missing in the Standard Data Form and not protected species. Shkodra and Buna Delta species differently from the other PAs are protected from setting-up the Emerald Network at National level). Pakleni Otoci Islands species were considered protected according to Croatian Regulation on strictly protected species (OJ 80/2013, 73/2016).

Biodiversity data were elaborated at first counting the NATURE 2000 directives' species for taxonomic groups and habitats for each PA. After that it was considered the species in NATURA 2000 lists but missing in the Standard Data Form. And then in the end, the species not protected but observed from personal observation or references. In the third section biodiversity data were analysed globally considering the species in each PA for each taxonomic group.

At the same manner all the habitats' types present in the Standard Data Form for each PA were listed with the coverage in hectares. The total number of habitat was reported for each PA.

Ecosystem Services are classified referring to the Common International Classification of Ecosystem Services – CICES and listed in EXCEL file describing their benefits, then each ecosystem service was associated to each PA.

Data were filled in the geo-database developed in the AdriaWet2000 project according to NATURA 2000 standards. Thanks to the database, data can be compared among PAs and analysed at transnational level. Moreover, target species can be selected for set up a joint monitoring programme of NATURA 2000 site. PPs defined a list of local ES and related ESS and described their benefits.

Common target species have been selected as ES quality level indicator among checked species for the application of biodiversity monitoring protocol (Act.T1.2).

1. Selection of protected areas

Within the implementation of the WP T1 and the activity T1.1 each PP has detect one pilot PAs NATURA 2000 to establish a transactional network from protected areas be involved in collecting and comparing existing NATURA 2000 biodiversity data. Data collection is the beginning to set a bioversity baseline in project areas toward the assessment of the ecosystem quality.

The Pilot Protected Areas involved in the IMPRECO project are:

- Isonzo River Mouth Regional Nature Reserve, for the Municipality of Staranzano (Italy);
- Bosco Nordio, for the Veneto Agricoltura – Veneto Region’s Agency for the innovation in the primary sector (Italy);
- Aquatina di Frigole, for the University of Salento – Department of Biological and Environmental Science and Technologies (DiSTeBA) (Italy);
- Škocjanski zatok Nature Reserve, for the DOPPS-BirdLife Slovenia (Slovenia);
- Pakleni Otoci Islands, for the Public Institution for the Management of Protected Areas in the County of Split and Dalmatia “Sea and Karst” (Croatia);
- Shkodra Lake and Buna Delta, for the Albanian Development Fund (Albania);
- North-Eastern Edge of Crete, for the Region of Crete (Greece).

These protected areas are highly different and heterogeneous as they host a huge variety of birds and other fauna and flora of conservation interest protected from the Habitat Directive and Bird Directive and rare or very rare plants included in Italian Flora that inhabit different ecosystems as forests, islands, wetlands and other water bodies. For instance, in the Isonzo River Mouth Nature Reserve there are 20 habitats of Community interest, two plants listed in Annex I of the Habitats Directive, 20 wildlife species included in Annex II of the same Directive and 98 species of birds included in Annex I of the “Birds Directive”. Bosco Nordio hosts rare and very rare species in the Italian flora (phyllirea, *Osyris alba*, marsh helleborine). There are several species of animals typical of the forests, which are absent or rare in the adjacent territories (long-eared owl, short-eared owl). Pakleni Islands is the only one pilot area with respect to the others ones characterized of the presence of a marine habitat. The undersea environments host *Posidonia oceanica* beds protected from NATURA 2000 network.

2. Description of selected protected areas

2.1 ISONZO RIVER MOUTH NATURE RESERVE (Riserva Naturale Regionale Foce dell’Isonzo)

Foce dell’Isonzo – Isola della Cona (IT3330005) (Isonzo River Mouth Regional Nature Reserve) is located in the east of Friuli-Venezia Giulia (Italy), along the final section of the Isonzo

River. It develops across the municipalities of Staranzano, San Canzian d'Isonzo, Fiumicello and Grado, covering an area of 2,338 hectares, 1,154 of which are marine environments. The Reserve stretches up to the far east of the Po Valley (Isonzo Plain) and includes the final part of the fluvial section on the high plain. It is characterised by evident gravelly alluvium, while in areas on the low plain, with their predominantly loamy soils, we find extensive reclamation areas from the twentieth century. In this section, there are still several remnants of an alluvial forest and channelled spring watercourses. In the most southern part of this area, we find an entire estuary environment, most of which is still marshland, featuring brackish and salt clayey alluvium (flood plains, sandbanks and mudflats) as well as sand deposits on the bar of the estuary, which emerge as a few small islands. Since the 1990s, this area known as Isola della Cona has undergone a series of initiatives which have led to the creation of a temporary freshwater marsh known as “il Ripristino”. Along with the establishment of the Foce dell'Isonzo Nature Reserve in 1996 and the launch of a programme to reconstruct infrastructures and for renaturation, these initiatives have significantly increased the number of species found in these wetland environments, and in particular the birdlife, with over 300 species being recorded of migratory, winter, summer and non-migratory birds. Most of the reserve corresponds with the SCI “Foce dell'Isonzo - Isola della Cona” IT3330005 and with the SPA of the same name. In fact, there are 20 habitats of Community interest (3 are priorities), with two plant species listed in Annex II of the “Habitats Directive” (*Gladiolus palustris* and the priority *Salicornia veneta*) and 128 species of birds included in the Art. 4 of the “Birds Directive”.

In total, the most recent NATURA 2000 Standard Data Form (2017) of Isonzo River Mouth Regional Nature Reserve reports 156 species belong to seven taxonomic groups (Amphibians, 5; Birds, 128; Fish, 6; Invertebrates, 2; Mammals, 5; Plants, 3; Reptiles, 7). Birds are the most abundant taxonomic group of species included in the NATURA 2000 Standard Data Form.

Table 2 – NATURA 2000 directives' species and other important species of Isonzo River Mouth Nature Reserve included in the NATURA 2000 Standard Data Form, 2017.

Habitats	Amphibians	Birds	Fish	Invertebrates	Mammals	Plants	Reptiles	Total
Coastal lagoon		3	2			1		6
Coastal lagoon, Marine		9	2					11
Freshwaters	1	2	1					4
Coastal lagoon, Freshwaters		51	1			1		53
Coastal lagoon, Freshwaters, Marine		12						12
Land		44			4		5	53
Coastal lagoon, Land		1						1
Freshwaters, Land	4	3		2		1	1	11
Marine		3			1		1	5
Total	5	128	6	2	5	3	7	156

Furthermore 308 species listed in the NATURA 2000 directives were founded in the other scientific literature.

Table 3 – NATURA 2000 directives' species recorded in the Isonzo River Mouth Nature Reserve but not included in the NATURA 2000 Standard Data Form.

Habitats	Amphibians	Birds	Fish	Invertebrates	Mammals	Plants	Reptiles	Total
Coastal lagoon		4	4			1		9
Coastal lagoon, Marine		4	43	1		3		51
Freshwaters			20			1		21
Coastal lagoon, Freshwaters		33						33
Coastal lagoon, Freshwaters, Marine		12						12
Land		139			27	4	2	172
Freshwaters, Land	3						1	4
Marine		4			2			6
Total	3	196	67	1	29	9	3	308

Table 4 - Number of species in the Isonzo River Mouth Nature Reserve no protected by NATURA 2000 directives.

Habitats	Birds	Fish	Plants	Total
Coastal			3	3
Coastal lagoon	11		15	26
Coastal lagoon, Marine	1	31		32
Freshwaters		2	80	82
Coastal lagoon, Freshwaters	2		2	4
Land	23		556	579
Total	37	33	656	726

The **alien species** observed in the Isonzo River Mouth Nature Reserve are: *Acridotheres tristis*, *Anas bahamensis*, *Anas flavirostris*, *Anas versicolor*, *Anser caerulescens*, *Anser indicus*, *Balearica pavonina*, *Cairina moschata*, *Caracara cheriway*, *Cygnus atratus*, *Dendrocygna autumnalis*, *Dendrocygna bicolor*, *Euplectes franciscanus*, *Lamprolornis calybaeus*, *Leiothrix lutea*, *Netta peposaca*, *Nymphicus hollandicus*, *Ploceus cucullatus*, *Psittacula krameri*, *Streptopelia risoria*, *Tadorna tadornoides*, *Threskiornis aethiopicus*, *Carassius auratus*, *Carassius carassius*, *Chondrostoma nasus*, *Gambusia holbrooki*, *Hypophthalmichthys nobilis*, *Ictalurus melas*, *Lepomis gibbosus*, *Micropterus salmoides*, *Pseudorasbora parva*, *Oncorhynchus mykiss*, *Silurus glanis*, *Stizostedion lucioperca*, *Myocastor coypus*, *Ailanthus altissima*, *Ambrosia artemisiifolia*, *Amorpha fruticosa*, *Artemisia verlotorum*, *Arundo donax*, *Aster squamatus*, *Azolla filiculoides*, *Beta vulgaris* subsp. *vulgaris*, *Buddleja davidii*, *Conyza canadensis*, *Conyza sumatrensis*, *Cuscuta campestris*, *Cuscuta scandens* subsp. *cesatiana*, *Datura stramonium* subsp. *stramonium*, *Echinocystis lobata*, *Elaeagnus argentea*, *Fallopia japonica*, *Galega officinalis*, *Galinsoga ciliata*, *Gleditsia triacanthos*, *Helianthus annuus*, *Helianthus tuberosus*, *Hemerocallis fulva*, *Juglans regia*, *Laurus nobilis*, *Lepidium virginicum*, *Ligustrum japonicum*, *Ligustrum lucidum*, *Lonicera japonica*, *Medicago sativa*, *Morus alba*, *Myagrurn perfoliatum*, *Oxalis fontana*, *Panicum capillare*, *Panicum dichotomiflorum*, *Panicum*

miliaceum subsp. *miliaceum*, *Papaver somniferum*, *Paspalum distichum*, *Platanus hispanica*, *Populus canadensis*, *Potentilla indica*, *Prunus cerasifera* subsp. *cerasifera*, *Pyrus communis*, *Robinia pseudacacia*, *Senecio inaequidens*, *Sinapis alba* subsp. *alba*, *Solidago gigantea*, *Sorghum halepense*, *Tamarix africana*, *Tamarix parviflora*, *Trachycarpus fortunei*, *Ulmus pumila*, *Veronica persica*, *Trachemys scripta scripta*, *Tinca tinca*, *Acer platanoides*, *Alnus glutinosa*, *Bidens frondosa*.

2.2 BOSCO NORDIO NATURE RESERVE (Riserva Naturale Integrale Bosco Nordio)

Bosco Nordio (IT3250032) is situated on the most ancient dune system of the coastal area of Venice between Chioggia (VE) and the river Po, which are the result of the building activity by the rivers Po and Adige during the last 4,000 years. Bosco Nordio, which was once called Fosson or Cerreto, seems to have pre-Roman origins. It belonged first to the town of Chioggia, it was then given to the Nordio family in 1565, which completely destroyed the wood in order to cultivate the land. Andrea Nordio, at the end of the 18th century, wanted to plant a pinewood with stone pines on the rests of the ancient wood consisting of holm oaks, laurels, and other Mediterranean species. Today only about 160 hectares of the original forest remain. In 1959, 113 hectares were sold to the State and became national Nature Reserve with the decree D.M. 26/7/1971. Nowadays, it is managed by Veneto Agricoltura. *Quercus ilex*, *Quercus robur* and *Fraxinus ornus* are the most common tree species. The clearings in the forest show a rare, typical vegetation of the ancient dunes ("Grey dunes"). Bosco Nordio is a SAC (IT 3250032), and present 8 habitats of Community interest (3 are priorities habitats). The Reserve has an important herpetofauna, with a total of 20 species. In total, the NATURA 2000 Standard Data Form (2013) of Bosco Nordio Nature Reserve reports 51 species belong to six groups (Amphibians, 5; Birds, 17; Invertebrates, 1; Mammals, 5; Plants, 17; Reptiles, 6).

Table 5 – NATURA 2000 directives' species and other important species of Bosco Nordio Nature Reserve included in the NATURA 2000 Standard Data Form, 2013.

Habitats	Amphibians	Birds	Invertebrates	Mammals	Plants	Reptiles	Total
Land		17	1	5	17	5	45
Freshwaters, Land	5					1	6
Total	5	17	1	5	17	6	51

Furthermore 68 species listed in the NATURA 2000 directives were founded in the other scientific literature.

Table 6 – NATURA 2000 directives' species in the Bosco Nordio Nature Reserve but not included in the most recent NATURA 2000 Standard Data Form.

Habitats	Amphibians	Birds	Fish	Lichens	Mammals	Plants	Reptiles	Total
Freshwaters		13	2		1			16
Land		29		2	7	5	4	47
Freshwaters, Land	3				1		2	6
Total	3	42	2	2	9	5	6	69

Table 7 - Number of species in the Bosco Nordio Nature Reserve not protected by NATURA 2000 directives.

Habitats	Amphibians	Birds	Invertebrates	Mammals	Plants	Reptiles	Total
Freshwaters					12		12
Land		1	133	1	214	1	350
Freshwaters, Land	2		1				3
Total	2	1	134	1	226	1	365

The **alien species** observed in the Bosco Nordio Nature Reserve are: *Procambarus clarkii*, *Myocastor coypus*, *Acer pseudoplatanus*, *Arabidopsis thaliana*, *Buddleja davidii*, *Conyza albida*, *Conyza canadensis*, *Gambusia holbrooki*, *Ligustrum japonicum*, *Oenothera biennis*, *Oxalis stricta*, *Paspalum dilatatum*, *Phytolacca americana*, *Yucca gloriosa*, *Trachemys scripta*.

2.3 AQUATINA DI FRIGOLE

Aquatina di Frigole is NATURA 2000 site (IT9150003), established in accordance to European Habitat Directive 92/43/CEE. This site is located on the Adriatic Sea coastline of the Salento peninsula (South-East Italian coast, 40.4425N – 18.2376E), about 13 km Northeast of the town of Lecce (Italy). The NATURA 2000 covers both marine and terrestrial habitats. A lagoon of about 43 hectares is included among the terrestrial habitats. Information concerning both the environment quality and the fishery in the lagoon was already available in XVIII century publications, but the first scientific paper on the fish yield was published when the lagoon was proposed to develop aquaculture activities in 1982). The University of Salento has been managing the lagoon of Aquatina since 1985 and the Research Centre for Aquiculture and Fisheries was established. Actually the lagoon is also utilized to promote activities concerning environmental education and sustainable aquatic sports (e.g., snorkeling, SUP). The Aquatina di Frigole NATURA 2000 site is characterized by a variety of fauna and flora species, which can be divided into following groups: plants, algae, zooplankton, macroinvertebrates assemblages, fishes, amphibians, reptiles, birds, and mammals. Recently new Mediterranean endemic species (e.g., *Pinna nobilis*) and alien species (e.g., *Callinectes sapidus*) were recognized as well as the impact of plastics and micro-plastics were underlined.

In total, NATURA 2000 Standard Data Form (2015) reports for Aquatina di Frigole 41 species belong to six taxonomic groups (Amphibians, 1; Birds, 28; Fish, 1; Invertebrates, 2; Plants, 2; Reptiles, 7).

Table 8 – NATURA 2000 directives' species and other important species of Aquatina di Frigole included in the NATURA 2000 Standard Data Form, 2015.

Habitats	Amphibians	Birds	Fish	Invertebrates	Plants	Reptiles	Total
Aquatic vegetation				2			2
Coastal lagoon		5					5
Coastal lagoon, Land		4					4
Freshwaters		1					1
Freshwaters, Land	1	1					2
Coastal lagoon, Marine		1					1
Land		7			2	7	16
Marine		4	1				5
Land, Marine		2					2
Coastal lagoon, Pond		1					1
Wetland		2					2
Total	1	28	1	2	2	7	41

Furthermore 31 species listed in the NATURA 2000 directives were founded analyzing other scientific literature.

Table 9 – NATURA 2000 directives' species of the Aquatina di Frigole not included in the most recent NATURA 2000 Standard Data Form.

Habitats	Fish	Invertebrates	Plants	Total
Coastal lagoon, Freshwaters, Marine	1			1
Coastal lagoon, Marine	15		1	16
Marine	9	1		10
Freshwaters, Marine	4			4
Total	29	1	1	31

Table 10 - Number of no protected species by NATURA 2000 directives founded in Aquatina di Frigole.

Habitats	Algae	Fish	Invertebrates	Plants	Total
Coastal lagoon				5	5
Coastal lagoon, Freshwaters				1	1
Coastal lagoon, Marine	26	4	78	2	110
Land				20	20
Marine		7	30		37
Freshwaters, Marine	1			1	2
Coastal lagoon, Freshwaters, Marine	1				1
Coastal lagoon, Land, Marine				1	1
Total	28	11	108	30	177

The **alien species** observed in the Aquatina are: *Acanthophora nayadiformis*, *Prorocentrum minimum*, *Atherina boyeri*, *Beroe ovate*, *Callinectes sapidus*, *Eutintinnus apertus*, *Ficopomatus enigmaticus*, *Gibbula albida*, *Hydroides dianthus*, *Hydroides elegans*, *Mnemiopsis leidyi*, *Palaemon elegans*, *Terebella lapidaria*, *Carpobrotus edulis*, *Cistus ladanifer*, *Convolvulus arvensis*, *Dittrichia viscosa*, *Halimione portulacoides*, *Olea europaea*, *Pancratium maritimum*, *Pinus pinaster*, *Quercus ilex*, *Salicornia perennans*, *Anas platyrhynchos*, *Nycticorax nycticorax*, *Emys orbicularis*.

2.4 ŠKOCJANSKI ZATOK NATURE RESERVE (Naravni rezervat Škocjanski zatok)

Škocjanski zatok (SI3000252) (Škocjanski zatok Nature Reserve) is a coastal wetland located in the outskirts of the city of Koper on Slovenian coast in North-East Adriatic. It's a state-owned nature reserve and from 1999 on managed by an NGO – DOPPS-BirdLife Slovenia. It was designated in 1998 in quite degraded state, but after extensive habitat restoration finished in 2007, reserve hosts a huge variety of birds and other fauna and flora. Birds are the most outstanding fauna group: a reserve area of only 122 hectares hosts over 245 species and the number is still increasing. This is over 60% of all bird species observed in Slovenia. The outstanding biodiversity is a direct positive result of the carefully planned and implemented restoration and management of the reserve. Due to the extremely positive impact to the reserve's biodiversity increase, the restoration is considered one of the biggest success stories of modern nature conservation in Slovenia. In the beginning of March 2016, the reserve was reopen after the construction of visitor facilities with a primary goal to improve the quality of the visitor experience. Besides the visitor centre, the majority of the buildings were built for the observation of wildlife. Among them, the round central observatory is definitely the most exciting one, showing the views all around the reserve as well as the underwater view of the freshwater marsh. The construction of the facilities followed the sustainable construction principles and was co-financed by European Regional Development Fund. Besides visitor centre, several observation hides and a theme trail illustrate the area's diverse range of plant and animal life, including many rare and endangered species. Camargue horses and Podolian cattle, which help to maintain the vegetation balance of the freshwater marsh, add to the diversity of the Reserve. The story of Škocjanski zatok is a story of protection and restoration of the area, inspired by remarkable commitment and love for nature. In total, NATURA 2000 Standard Data Form (2016) of Škocjanski zatok Nature Reserve reports 2 species belong to two taxonomic groups (Fish, 1; Invertebrates, 1).

Table 11 – NATURA 2000 directives' species and other important species in the Škocjanski zatok Nature Reserve included in the most recent NATURA 2000 Standard Data Form, 2016.

Habitats	Fish	Invertebrates	Total
Coastal lagoon, Marine	1		1
Freshwaters		1	1
Total	1	1	2

Furthermore 296 species listed in the NATURA 2000 directives were founded analyzing other scientific literature.

Table 12 – NATURA 2000 directives' species of the Škocjanski zatok Nature Reserve but not included in the most recent NATURA 2000 Standard Data Form.

Habitats	Amphibians	Birds	Fish	Invertebrates	Mammals	Plants	Reptiles	Total
Coastal lagoon		20						20
Freshwaters		31	3					34
Coastal lagoon, Freshwaters		47	6					53
Freshwaters, Land	5						4	9
Coastal lagoon, Freshwaters, Land							2	2
Land		129		3	21	3	6	162
Coastal lagoon, Land		1						1
Freshwaters, Land		1						1
Marine			1					1
Coastal lagoon, Marine			10					10
Coastal lagoon, Freshwaters, Marine			3					3
Total	5	229	23	3	21	3	12	296

Table 13 - Number of species of the Škocjanski zatok Nature Reserve no protected by NATURA 2000 directives.

Habitats	Amphibians	Birds	Fish	Invertebrates	Mammals	Plants	Reptiles	Total
Coastal lagoon		5		1				6
Coastal lagoon, Marine				43				43
Freshwaters		1		28		10		39
Coastal lagoon, Freshwaters		7		1				8
Freshwaters, Land	1			66		1	1	69
Land		10		657	2	293	2	964
Marine			1	1				2
Coastal Lagoon, Marine			1	5				6
Coastal lagoon, Freshwaters, Marine			3					3
Total	1	23	5	802	2	304	3	1140

The **alien species** observed in the Škocjanski zatok Nature Reserve are: *Cairina moschata*, *Cygnus atratus*, *Carassius carassius*, *Carassius gibelio*, *Cyprinus carpio*, *Gambusia affinis*, *Gambusia hoolbroki*, *Lepomis gibbosus*, *Scardinius erythrophthalmus*, *Crassostrea gigas*, *Ficopomatomus enigmaticus*, *Harmonia axyridis*, *Ruditapes philippinarum*, *Myocastor coypus*, *Erigeron annuus*, *Lepidium virginicum*, *Trachemys scripta elegans*, *Trachemys scripta scripta*, *Amorpha fruticosa*, *Bidens frondosa*, *Lonicera japonica*, *Helianthus tuberosus*, *Robinia pseudoacacia*, *Musculista*

senhousia, *Mytilaster minimus*, *Artemisia annua*, *Bursatella leachii*, *Artemisia verlotiorum*, *Lepidium virginicum*.

2.5 PAKLENI OTOCI ISLANDS

Pakleni otoci Islands (HR3000095) (Pakleni Islands) is an archipelago of 19 islands and islets declared a significant landscape in November 1968 because of their complex and deeply indented geography stretching over 634.38 ha. The undersea environments surrounding the islands are part of the European Ecological NATURA 2000 network with the aim of preserving meadows of posidonia, reef habitat with established infralittoral algal and coralligenous communities, infralittoral sandy bottoms and marine caves. The Pakleni Islands are among the most beautiful and geomorphologically complex islands in Adriatic coast. The islands are made of limestone and on the largest, Sv. Clement, dry land reaches a height of 96 meters. The Vinogradišće bay is remarkable for its diluvian sand which forms a picturesque sandy beach. The natural vegetation is made up primarily of machete and Aleppo pine that, with their limestone shorelines, give the islands their characteristic green bordered with white appearance from the air. The biodiversity of the islands' marine habitats is characterized by the western region of the archipelago, which includes the large island of Vodnjak with its surrounding islets and reefs, Močiguzica Point and the island of Stambedar with its Pločica islets. Every island and islets are almost completely surrounded by a dense, well developed meadows of *Posidonia oceanica*, which forms a priority N2K habitat. Other important habitats, such as coralligenous communities and sea caves, are exceptionally developed on the most southern and most western area. Among such exceptional micro-locations are the shallows near the Vodnjak Veliki Island, known as Kampanel. The Kampanel shoal is a complex underwater rocky ridge extending from 10 m to nearly 60 m deep. At the depth of 15 m there is a very well developed coral community with large and dense settlements of gorgonian species *Paramuricea clavata* and *Eunicella cavolini*, as well as numerous cracks and fissures with a complex of sea caves. At a depth of 30 m, there is a natural tunnel which one can pass from one side of the ridge to the other. Due to the variety and richness of habitats and taxa, Kampanel is listed as one of the 10 most attractive diving sites on the Adriatic, so this place is visited by numerous diving boats and scuba divers. It is estimated how at least 32 marine taxa protected by Croatian law or/and international directives inhabit its marine area. On the land, there was 29 recorded protected land plants and 25 protected species of birds. In their local dialect, the inhabitants of Hvar call the Pakleni Islands "Škoji", however the name Pakleni is derived from the word "paklina", meaning *pine resin*, which was harvested there in years past and used as water-proofing for the boat building and repair done in Hvar's many protected harbours.

The Pakleni Islands are located in the heart of historic central Adriatic navigation routes, which shaped their current development. In recent decades the islands have been subject to high tourist pressure, both from their own reputation and due to their close proximity to the significant tourist centre of Hvar. This pressure is most evident from the construction of illegal tourist facilities and poorly managed nautical tourism, particularly from marine litter and careless anchoring endangering undersea habitats.

NATURA 2000 Standard Data Form (2015) reports no species included in the Habitat and Birds Directives. Here, the species strictly protected by National Regulation are reported. Some of these species are also included in the NATURA 2000 Directives (see Deliverable T1.1.2).

Table 14 – Strictly protected species of the Pakleni otoci Islands for taxonomic group and habitats according to Croatian Regulation on strictly protected species (OJ 80/2013, 73/2016).

Habitats	Algae	Birds	Fish	Invertebrates	Mammals	Plants	Total
Land		25				29	54
Marine	9		3	19	1	3	35
Total	9	25	3	19	1	32	89

Furthermore 30 species listed in the NATURA 2000 directives were founded analyzing other scientific literature.

Tabella 15 - NATURA 2000 directives' species of the Pakleni otoci Islands but not included in the most recent NATURA 2000 Standard Data Form.

Habitats	Birds	Fish	Invertebrates	Total
Land	6			6
Marine		18	6	24
Total	6	18	6	30

Table 16 - Number of species of the Pakleni Iotoci slands for taxonomic group and habitats. Table's data refer to references and personal observation.

Habitats	Algae	Fish	Invertebrates	Plants	Total
Land				545	545
Marine	15	6	92		113
Marine - Posidonia beds (<i>Posidonion oceanicae</i>)	73				73
Total	86	6	98	545	731

The **alien species** observed in Pakleni Islands are: marine - *Desmazeria marina*, *Hainardia cylindrica*, *Lathyrus ochrus*, *Parapholis incurva*, *Tanacetum cinerariifolium*, *Caulerpa cylindracea*, *Womersleyella setacea*, *Asparagopsis* sp.; terrestrial - *Acacia dealbata*, *Acacia horrida*, *Acca sellowiana*, *Aechmea fasciata*, *Aeonium arboretum*, *Agapanthus praecox*, *Agave americana*, *Agave americana* ssp. *americana*, *Agave attenuate*, *Agave aurea*, *Agave cerulata*, *Agave weberi*, *Agave chiapensis*, *Agave cupreata*, *Agave filifera*, *Agave filifera* spp. *schidigera*, *Agave garciae-mendozae*, *Agave geminiflora*, *Agave gentry*, *Agave gigantensis*, *Agave havardiana*, *Agave horrida*, *Agave hurteri*, *Agave impressa*, *Agave macroacantha*, *Agave aontana*, *Agave neomexicana*, *Agave parrasana*, *Agave parry*, *Agave parry* var. *parryi*, *Agave parry* var. *huachucensis*, *Agave parryi* var. *truncate*, *Agave potatorum*, *Agave salmiana*, *Agave salmiana* var. *ferox*, *Agave shrevei*, *Agave tecta*, *Agave tequilana*,

Agave titanota, *Agave triangularis*, *Agave vivipara* var. *vivipara*, *Albizia julibrissin*, *Aloe arborescens*, *Aloe barberae*, *Aloe africana*, *Aloe brevifolia*, *Aloe grandidentata*, *Aloe squarrosa*, *Aloe ciliaris*, *Aloe ferox*, *Aloe maculate*, *Aloe marlothii*, *Aloe striata*, *Aloe vera*, *Aptenia cordifolia*, *Archontophoenix alexandrae*, *Archontophoenix cunninghamiana*, *Arenga micrantha*, *Asparagus setaceus*, *Austrocylindropuntia subulata*, *Avena barbata*, *Beaucarnea recurvate*, *Beccariophoenix alfredii*, *Beccariophoenix madagascariensis*, *Bismarckia nobilis*, *Bougainvillea glabra*, *Bougainvillea spectabilis*, *Brachychiton rupestris*, *Brahea armata*, *Brahea brandegeei*, *Brahea calcarea*, *Brahea decumbens*, *Brahea pimo*, *Browningia* sp., *Brugmansia* sp., *Butia capitata*, *Butia eriospatha*, *Butia yatay*, *Caesalpinia gilliesii*, *Calamintha grandiflora*, *Callistemon citrinus*, *Carpobrotus acinaciformis*, *Carpobrotus edulis*, *Caryota obtuse*, *Caryota urens*, *Cedrus atlantica*, *Chamaerops humilis*, *Chamaerops humilis* var. *cerifera*, *Chlorophytum comosum*, *Cinnamomum camphora*, *Citrus aurantium*, *Citrus medica*, *Clivia minata*, *Codiaeum variegatum*, *Colocasia esculenta*, *Cordyline australis*, *Cotyledon orbiculata*, *Crassula lactea*, *Crassula ovate*, *Cycas cairnsiana*, *Cycas candida*, *Cycas ophiolitica*, *Cycas pectinata*, *Cycas petraea*, *Cycas platyphylla*, *Cycas revolute*, *Cynara cardunculus*, *Cyperus involucratus*, *Dasyllirion glaucophyllum*, *Dasyllirion serratifolium*, *Dasyllirion longissimum*, *Dasyllirion wheeleri*, *Datura* sp., *Dioon edule*, *Dioon merolae*, *Dioon spinulosum*, *Dracaena marginata*, *Dypsis decaryi*, *Dypsis decipiens*, *Echeveria* sp., *Echinocactus grusonii*, *Echinopsis oxygona*, *Echium candicans*, *Encephalartos altensteinii*, *Encephalartos eugene-maraisii*, *Encephalartos lehmannii*, *Encephalartos middelburgensis*, *Encephalartos princeps*, *Epicactus* sp., *Erythrina crista-galli*, *Eucalyptus camaldulensis*, *Eucalyptus gunnii*, *Euphorbia abyssinica*, *Euphorbia coerulescens*, *Euphorbia tirucalli*, *Ferocactus emoryi* ssp. *rectispinus*, *Ferocactus latispinus* ssp. *latispinus*, *Ferocactus macrodiscus* ssp. *macrodiscus*, *Ferocactus pilosus* var. *pilosus*, *Ferocactus schwarzii*, *Ferocactus townsendianus*, *Ficus australis*, *Ficus carica*, *Ficus elastic*, *Gasteria* sp., *Gazania rigens*, *Gleditsia triacanthos*, *Grevillea banksii*, *Grevillea robusta*, *Gymnocalycium saglionis*, *Hibiscus rosa-sinensis*, *Hylotelephium telephium*, *Jasminum fluminense*, *Jasminum polyanthum*, *Jubaea chilensis*, *Lampranthus* sp., *Lantana camara*, *Lavandula stoechas*, *Lavandula dentate*, *Lilium* sp., *Livistona australis*, *Livistona chinensis*, *Livistona decora*, *Livistona fulva*, *Livistona mariae*, *Livistona rigida*, *Livistona saribus*, *Macrozamia communis*, *Macrozamia fraseri*, *Macrozamia johnsonii*, *Macrozamia moorei*, *Macrozamia riedlei*, *Mandevilla sanderi*, *Medemia argun*, *Mirabilis jalapa*, *Monstera deliciosa*, *Musa* sp., *Opuntia auberi*, *Opuntia engelmannii* var. *engelmannii*, *Opuntia leucotricha*, *Opuntia rufida*, *Opuntia ficus-indica*, *Opuntia microdasys*, *Osteospermum jucundum*, *Oxalis deppei*, *Paeonia* sp., *Pandorea pandorana*, *Parajubaea cocoides*, *Parajubaea sunkha*, *Parajubaea torallyi*, *Parajubaea torallyi* var. *microcarpa*, *Paraserianthes lophantha*, *Parkinsonia aculeate*, *Passiflora caerulea*, *Pelargonium crispum*, *Phoenix canariensis*, *Phoenix dactylifera*, *Phoenix roebelenii*, *Phoenix rupicola*, *Phoenix sylvestris*, *Phormium tenax*, *Photinia serratifolia*, *Phytolacca dioica*, *Pittosporum tobira*, *Plumbago auriculata*, *Portulacaria afra*, *Rhapis excels*, *Rhopalostylis sapida*, *Ricinus communis*, *Robinia pseudoacacia*, *Sabal mexicana*, *Sabal minor*, *Sabal rosei*, *Sabal uresana*, *Sabal yapa*, *Sansevieria cylindrical*, *Sansevieria trifasciata*, *Schefflera actinophylla*, *Schefflera arboricola*, *Schefflera arboricola* Hayata var. *variegata*, *Selenicereus grandiflorus*, *Sempervivum* sp., *Senecio bicolor* ssp. *cineraria*, *Strelitzia nicolai*, *Strelitzia reginae*, *Syagrus glaucescens*, *Syagrus romanzoffiana*, *Tecoma capensis*, *Trachelospermum jasminoides*,

Trachycarpus fortune, *Tradescantia pallida*, *Trithrinax campestris*, *Tulipa* sp., *Washingtonia robusta*, *Yucca aloifolia*, *Yucca gloriosa*, *Yucca elephantipes*, *Yucca rostrata*, *Zamia furfuracea*.

2.6 SHKODRA LAKE AND BUNA DELTA

Shkodra Lake, the largest lake on the Balkan Peninsula, is located on the border between Montenegro and Albania, in the southern part of the Dinaric Alps. The catchment basin is about 5,500 km² (4,470 km² in Montenegro and 1,030 km² in Albania), and flows south-east into the Adriatic via the Buna (Bojana) River. On the Albanian part, there are about 170,000 inhabitants in the Shkodra Lake area divided in several local administrative units. The Buna River is the outflow of the Lake Shkoder and receives the waters of the Drin River Basin with a total area of about 21,000 km². The Buna River – Velipojë Protected Landscape (BRPL or the Landscape) comprises one of the most important coastal wetlands areas of the country. Located between Lake Shkodra and the Adriatic Sea, the area was designated as a protected landscape in 2005, with a total extent of 23,027 ha. Situated around the delta of the Buna River, the Park supports a great variety of wetland communities. Together with recent coastal dune deposits and inland low karst ridges, the landscape includes a wide diversity of geological types, landscapes, habitats and plant and animal species. From a human perspective the BRPL includes parts of eight municipal units, for which the total area is 49,294 ha and the total population (2011) was 68,128 inhabitants. Local livelihoods, in the form of crop and livestock production, fishing and tourism, are strongly dependent on the use of constituent natural resources within the BRPL.

Actually, the NATURA 2000 network is not applied in Albania. Anyway, Albania has a National Regulation for the protection of species named “Emerald Network”. Based on Emerald system, Shkodra Lake and Buna Delta host 66 species belong to six taxonomic groups (Amphibians, 5; Bird, 14; Fish, 14; Mammal, 9; Plant, 23; Reptiles, 1). Coastal lagoon and freshwater habitats inhabit the most number of species (57).

Table 17 – Species list according to Emerald Network under the Bern Convention of the Shkodra Lake and Buna Delta for taxonomic groups and habitats.

Habitats	Amphibians	Birds	Fish	Mammals	Plants	Reptiles	Total
Coastal lagoon, Freshwaters	5	14	14		23	1	57
Land				9			9
Total	5	14	14	9	23	1	66

The **alien species** observed in Shkodra Lake and Buna Delta is: *Cyprinus carpio*.

2.7 NORTH-EASTERN EDGE OF CRETE

Voreioanatoliko akro kritis: dionysades, elasa kai chersonisos sidero (akra mavro mouri – vai – akra plakas) kai thalassia zoni (GR4320006) (North-Eastern Edge of Crete – NEEC). Three partly overlapping NATURA 2000 sites are designated in the North-Eastern Edge of Crete (NEEC for short). NEEC is also part of the UNESCO “Sitia Natural Park”. NEEC is a complex area of important habitats, which includes the unique in Europe Vai Palm Forest (one of the 19 “Aesthetic Forests” of Greece, under the management of the Forestry Department), Sidero peninsula, small coastal wetlands protected by the Greek legislation, Dyonissades and Elassa groups of islets and adjacent marine area. NEEC is one of the driest areas of Greece. Geologically, it consists of limestones and dolomites of the upper Cretaceous, bedded crystalline limestones of the Permian, phylites and neogene and alluvial deposits. The vegetation is mainly phrygana. There are a lot of valleys with maquis, some of them degrading. The Theophrastus palm forest (*Phoenix theophrastii*) of Vai is situated in a coastal valley. There are plantations of bananas in greenhouses and the land near the villages is cultivated. At the eastern coast there are sand dunes. On the west side of Sidero peninsula there are *Posidonia oceanica* beds and flocks of *Tursiops truncatus* have been observed. On the tip of Sidero peninsula there is a military base. The Dyonissades islets group consists of Permian limestone while Elasa islet consists of dolomites and limestones of upper Cretaceous. The vegetation on the islets is phrygana. In the larger islet of Dyonissades group as well as on the opposite coast of Crete the coastline is characterized by sea cliffs. In 2015, the site was extended 2nm off the Cretan and surrounding islet coasts, to include important and vulnerable habitats of the circalittoral and deep zone, including biodiversity-rich facies of coralligenous assemblages (deep counterpart of Habitat Type 1170), and extensive detritus and rhodolith beds, at depths below ~40 m. Several islets, reefs and shoals add to the geographic and topographic complexity of the site. A significant number of Cretan endemic plant species and protected plant species occur in this area. The non-endemic *Lygeum spartum* belongs to the desert-like floristic element, occurring only in steppe communities in Crete but nowhere else in Greece (it occurs at similar habitats in Spain, Sardinia, Sicily and Italy). Concerning the fauna, there are a lot of invertebrate endemic species and some vertebrate endemic subspecies. Reptiles *Lacerta trilineata* and *Podarcis erhardii*, besides being legally protected, they are also considered species of Community interest (Annex IV, Directive 92/43/EEC). The mammal *Pipistrellus savii* is considered species of Community interest (Annex IV, Directive 92/43/EEC) and protected by the Greek Law (Presidential Decree 67/1981) and by the Bern Convention (appendix II). A lot of land snail species are endemic to the site or to Crete. The Dyonissades islet group has been characterised as an Important Bird Area, especially for birds, which live at cliffs. Species of interest are *Falco eleonora*, *Falco naumani* and *Calonestris diomedea*. C. Diomedea’s Dionyssades population is one of the largest breeding populations of species in the Aegean Sea. Adjacent marine waters include shearwater foraging, resting and rafting areas. The marine area around Dionyssades and Elassa is threatened by illegal fishery, whereas the islets themselves are vulnerable due to overgrazing. Sandy coasts along Sidero peninsula attract numerous tourists. The Vai plam forest is threatened by underground water over-pumping for irrigation purposes and by the alien species of *Phoenix dactylifera*, which is related to *Phoenix theophrastii*. Other threats

are intensive cultivation, overgrazing, which is sometimes combined with intentional fire setting, illegal hunting and camping.

The NATURA 2000 Standard Data Form (2016) reports 81 species belong to four groups (Fish, 5; Invertebrate, 15; Mammal, 1; Plant, 60).

Table 18 – NATURA 2000 directives' species and other important species of North-Eastern Edge of Crete reported in the NATURA 2000 Standard Data Form, 2016).

Habitats	Fish	Invertebrates	Mammals	Plants	Total
Calcareous cliff crevices close to the sea.				1	1
Calcareous cliffs, rubble, woodland, embankments along roadsides				1	1
Calcareous cliffs, shady rocky corridors				1	1
Calcareous rock crevices, phrygana, clayous surfaces				1	1
Calcareous rocks				5	5
Calcareous rocks, Phrygana				1	1
Calcareous rocks, Rocky cliffs on the coast				1	1
Cliffs, Phrygana close to the coast				1	1
Cliffs, Scree, Fields, Ruderal sites				1	1
Cliffs, Walls, Gravel coasts				1	1
Coastal lagoon, Marine				1	1
Dry rock crevices, rocky phrygana				1	1
Dry rocky phrygana, Rock crevices				1	1
Dry ruderal sites, overgrazed phrygana, subalpine shrublands				1	1
Grassland				1	1
Heathland and shrub, sparsely vegetated land				1	1
Limestone cliffs, Phrygana, Sandstone				1	1
Limestone cliffs. Dragonada, Gianissada islets				1	1
Marine	5	15	1	8	29
Phrygana				4	4
Phrygana, fallow land, coasts				1	1
Phrygana, Rock crevices				1	1
Phrygana, rocks, riparian woodlands				1	1
Phrygana, rocks, scree				1	1
Phrygana, Ruderal sites, Vineyards, Fallow land				1	1
Phrygana, woodland, on limestone				1	1
Phyana, on clay, sand				1	1
Rock crevices				2	2
Rock crevices on steep cliffs				1	1
Rocks, pine forests				1	1
Rocky coasts by the sea (Dyonissades islets)				1	1
Rocky coasts, cliffs (Occurs on islets Dyonissades, Elasa and Sideros peninsula)				2	2
Rocky phrygana, Fallow land, Rock crevices				1	1

Habitats	Fish	Invertebrates	Mammals	Plants	Total
Rocky phrygana, rocks				1	1
Rocky walls, Phrygana				1	1
Saline sites by the sea or inlands, on shrubby Chenopodiaceae				1	1
Sandy coasts				1	1
Sandy seabed 1-10 m deep				1	1
Seabed, on sand and mud close to ports				1	1
Shady, humid rock crevices, rubble, on limestone				1	1
Steppe-grassland, Dry phrygana on clay soils				1	1
Wetland, Woodland and forest.				1	1
Woodland, Maquis, Phrygana, Rock crevices, mainly in half-shadowy sites				1	1
Woodland, Phrygana, Fallow land, Olive groves				1	1
Total	5	15	1	60	81

Furthermore 80 species listed in the NATURA 2000 directives were founded analyzing other scientific literature.

Table 19 – NATURA 2000 directives' species of the North-Eastern Edge of Crete not included in the most recent NATURA 2000 Standard Data Form, 2016.

Habitats	Birds	Total
Agricultural mosaics, cliffs	2	2
Agricultural mosaics, cropland	3	3
Agricultural mosaics, cropland, grassland	1	1
Agricultural mosaics, cropland, grassland, heathland and shrub, sparsely vegetated land, woodland and forest	1	1
Agricultural mosaics, cropland, grassland, heathland and shrub, wetland	2	2
Agricultural mosaics, cropland, grassland, sparsely vegetated land, urban	1	1
Agricultural mosaics, cropland, heathland and shrub	1	1
Agricultural mosaics, cropland, heathland and shrub, rivers and lakes	1	1
Agricultural mosaics, cropland, heathland and shrub, sparsely vegetated land, woodland and forest	1	1
Agricultural mosaics, cropland, heathland and shrub, woodland and forest	1	1
Agricultural mosaics, cropland, urban	2	2
Agricultural mosaics, cropland, urban, woodland and forest	1	1
Agricultural mosaics, cropland, woodland and forest	2	2
Coastal	1	1
Coastal, marine inlets	1	1
Coastal, marine inlets and transitional waters	3	3
Coastal, open ocean, shelf	1	1
Coastal, rivers and lakes, sparsely vegetated land	1	1
Cropland, grassland, heathland and shrub, sparsely vegetated land	1	1
Cropland, grassland, wetland	1	1
Grassland	1	1

Habitats	Birds	Total
Grassland, heathland and shrub, sparsely vegetated land	2	2
Grassland, rivers and lakes, sparsely vegetated land, wetland	1	1
Heathland and shrub, woodland and forest	1	1
Marine inlets and transitional waters	1	1
Marine inlets and transitional waters	1	1
Marine, rocky sea cliff	1	1
Open ocean, shelf	2	2
Rivers and lakes, sparsely vegetated land	1	1
Rivers and lakes, sparsely vegetated land, urban, wetland	1	1
Rivers and lakes, sparsely vegetated land, wetland	2	2
Rivers and lakes, wetland	11	11
Rivers and lakes, wetland	1	1
Rivers and lakes, wetland	7	7
Rivers and lakes, woodland forest	1	1
Rivers lakes and rocky marine shores	1	1
Sparsely vegetated land	2	2
Sparsely vegetated land, rocky cliffs	2	2
Sparsely vegetated land, urban	1	1
Sparsely vegetated land, wetland	2	2
Sparsely vegetated land, woodland and forest	1	1
Wetland	7	7
Woodland and forest	2	2
Total	80	80

The **alien species** observed in the North-Eastern Edge of Creta are: *Caulerpa cylindracea*, *Ganonema farinosum*, *Halophila stipulacea*, *Siganus luridus*, *Synaptula reciprocans*, *Torquigener flavimaculosus*, *Siganus rivulatus*.

3. Global analysis of species and habitat

Aiming to define the ES and set a biodiversity baseline to understand what are current ES conditions an inventory of species, habitats, ES and ESS has carried out. Inventory of species, habitats, ecosystems and ecosystem services has made at local level by PPs and merged at transnational level. Data collection is carried out by using both literature and official available data (checklists provided by PAs) and completed with new data collected through in-field analysis (observation, pay back calls, transects, zoning schemes, etc.). Data are filled in the database according to NATURA 2000 standards with information to habitats, species, protection level of the species, presence of alien species and references.

3.1. Species

In total, taking as a reference the priority species from NATURA 2000 standard data form, 486 species belong to 8 taxonomic groups inhabit the six Pilot Protected Areas (N.B. Pakleni Otoci Islands species are protected according to Croatian Regulation on strictly protected species (OJ 80/2013, 73/2016); species of Shkodra and Buna delta are protected by Emerald Network under Bern Convention). Isonzo River Mouth Regional Nature Reserve host 156 species followed to North-Eastern Edge of Creta with 81, Shkodra Lake and Buna Delta with 66 species and Bosco Nordio, Aquatina, Škocjanski zatok Nature Reserve with 51, 41 and 2 species, respectively. The taxonomic group Birds holds the most number of species (212) followed to Plants, (137), Invertebrates, (40), Fish, (30) Mammals and Reptiles, (21) and Amphibians, (16). Algae have only 9 species. The group Birds shows the highest number of species in the Isonzo River Mouth Regional Nature Reserve. Plants, on the other hand, are the most represented group among the Protected Areas. It has the highest number of species in 4/7 Protected Areas. The alien species in the protected areas are 36 belong to Plants (15), Fish (7), Amphibians, Birds and Mammals (4), Invertebrates and Reptiles (1). Shkodra and Buna delta shows the most number of alien species followed of Voreioanatoliko akro kritis: dionysades, elasa kai chersonisos sidero (akra mavro mouri – vai – akra plakas) kai thalassia zoni, Pakleni Otoci, Aquatina di Frigole and Foce dell'Isonzo.

Table 20 – Total number of species host on each Pilot Project Areas for taxonomic group and included in the NATURA 2000 Standard Data Forms.

	Foce dell'Isonzo - Isola della Cona	Bosco Nordio	Aquatina di Frigole	Škocjanski zatok	Pakleni Otoci	Shkodra lake and Buna delta	Voreioanatoliko akro kritis: dionysades, elasa kai chersonisos sidero (akra mavro mouri – vai – akra plakas) kai thalassia zoni	Total
Algae					9			9
Amphibians	5	5	1			5		16
Birds	128	17	28		25	14		212
Fish	6		1	1	3	14	5	30
Invertebrates	2	1	2	1	19		15	40
Mammals	5	5			1	9	1	21
Plants	3	17	2		32	23	60	137
Reptiles	7	6	7			1		21
Total	156	51	41		89	66	81	486

3.2. Habitats

The habitats included in the project pilot sites were firstly listed using the most recent NATURA 2000 Standard Data Form. The habitats of the Albanian pilot site were listed on the base of National regulation named “Emerald network”. A total of 52 habitats were found covering 38,530 hectares.

Table 21 – NATURA 2000 habitats present on the Pilot Projects Area and the cover in hectares. Habitat data on Albanian, Shkodra Lake and Buna Delta are not reported because it takes as a reference the Emerald National System. The habitats marked in yellow are not reported in the NATURA 2000 Standard Data Form.

Habitat N2k	Habitat N2k denomination	Foce dell'Isonzo - Isola della Cona (ha)	Bosco Nordio (ha)	Aquatina di Frigole (ha)	Škocjanski zatok (ha)	Pakleni otoci (ha)	Voreioanatoliko akro kritis: dionysades, elasa kai chersonisos sidero (akra mavro mouri – vai – akra plakas) kai thalassia zoni (ha)
1110	Sandbanks which are slightly covered by sea water all the time	1,194.90				730.00	23,605.00
1120	Posidonia beds			2,214.10		326.00	142.00
1130	Estuari	195.50					
1140	Mudflats and sandflats not covered by seawater at low tide	67.30			3.2951		
1150	Coastal lagoons			52.40	56.5855		1.53
1170	Reefs					197.00	2,818.00
1210	Annual vegetation of drift lines	1.3		158.15			
1240	Vegetated sea cliffs of the Mediterranean coasts with endemic <i>Limonium</i> spp.						364.86
1310	Salt pioneer swards	36.9		0.40	8.5284		0.61

Habitat N2k	Habitat N2k denomination	Foce dell'Isonzo - Isola della Cona (ha)	Bosco Nordio (ha)	Aquatina di Frigole (ha)	Škocjanski zatok (ha)	Pakleni otoci (ha)	Voreioanatoliko akro kritis: dionysades, elasa kai chersonisos sidero (akra mavro mouri – vai – akra plakas) kai thalassia zoni (ha)
1320	Spartina swards (<i>Spartinion maritimae</i>)	15.5					
1410	Mediterranean salt meadows (<i>Juncetalia maritimi</i>)	90.1			0.0024		1.12674
1420	Mediterranean and thermo-Atlantic halophilous scrubs	21.3		158.15	1.5863		5.15
1430	Halo-nitrophilous scrubs (Pegano-Salsoletea)						0.74
2110	Embryonic shifting dunes						1.11
2120	Shifting dunes along the shoreline with <i>Ammophila arenaria</i>			63.26			
2130	Fixed coastal dunes with herbaceous vegetation (“grey dunes”)	2.1	2.88				
2230	Malcolmietaalia dune grasslands						1.47
2250	Coastal dunes with <i>Juniperus</i> spp.		0.25	11.10			
2260	Cisto-Lavenduletaalia dune sclerophyllous scrubs			11.10			
3130	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea	11.5					
3150	Natural eutrophic lakes with Magnopotamion or Hydrocharition — type vegetation	11.0	0.08				
3240	Alpine rivers and their ligneous vegetation with <i>Salix elaeagnos</i>	15.2					
3260	Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation	15.0					
62A0	Eastern sub-mediterranean dry grasslands (<i>Scorzoneraetalia villosae</i>)	4.5					
3290	Intermittently flowing Mediterranean rivers of the Paspalo-Agrostidion						0
5210	Arborescent matorral with <i>Juniperus</i> spp						135.74
5330	Thermo-Mediterranean and pre-desert scrub						11.88

Habitat N2k	Habitat N2k denomination	Foce dell'Isonzo - Isola della Cona (ha)	Bosco Nordio (ha)	Aquatina di Frigole (ha)	Škocjanski zatok (ha)	Pakleni otoci (ha)	Voreioanatoliko akro kritis: dionysades, elasa kai chersonisos sidero (akra mavro mouri – vai – akra plakas) kai thalassia zoni (ha)
5420	Sarcopoterium spinosum phryganas						5,397.46
6410	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinia caerulea</i>)	3.6					
6420	Mediterranean tall humid herb grasslands of the Molinio-Holoschoenion	3.9	0.16				
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	6.1					
6510	Lowland hay meadows (<i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i>)	5.5					
7210	Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i>	0.7					0.38
8210	Calcareous rocky slopes with chasmophytic vegetation						0.20
8330	Submerged or partially submerged sea caves					0	0
9320	Olea and Ceratonia forests						64.76
9340	<i>Quercus ilex</i> and <i>Quercus rotundifolia</i> forests		105.26				
9540	Mediterranean pine forests with endemic Mesogean pines						
2130/G1.C4 -G1.C3	Habitat mosaic		1.65				
2270	Wooded dunes with <i>Pinus pinea</i> and/or <i>Pinus pinaster</i>		16.48				
6220	Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea						39.77
91F0	Riparian mixed forests of <i>Quercus robur</i> , <i>Ulmus laevis</i> and <i>Ulmus minor</i> , <i>Fraxinus excelsior</i> or <i>Fraxinus angustifolia</i> , along the great rivers (<i>Ulmion minoris</i>)		4.99				
91F0/9340	Habitat mosaic		4.53				
91L0	Illyrian oak-hornbeam forests (Erythronio-Carpinion)	2.1					
92A0	<i>Salix alba</i> and <i>Populus</i>	36.6					

Habitat N2k	Habitat N2k denomination	Foce dell'Isonzo - Isola della Cona (ha)	Bosco Nordio (ha)	Aquatina di Frigole (ha)	Škocjanski zatok (ha)	Pakleni otoci (ha)	Voreioanatoliko akro kritis: dionysades, elasa kai chersonisos sidero (akra mavro mouri – vai – akra plakas) kai thalassia zoni (ha)
	<i>alba</i> galleries						
92D0	Southern riparian galleries and thickets (Nerio-Tamaricetea and <i>Securinegion tinctoriae</i>)						0.96
9340/2270	Habitat mosaic		0.27				
9340/G1.C3	Habitat mosaic		1.04				
9340/G1.C4	Habitat mosaic		0.34				
9370	Palm groves of Phoenix						19.08
C1.3/3140	Habitat mosaic		0.12				
91E0	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, <i>Alnion incanae</i> , <i>Salicion albae</i>)	48.0					

3.3. EcoSystems (ES) and EcoSystem Services (ESS)

3.3.1. Methodological approach

Methodological steps:

- Mapping ES. ES are classified referring to the Corine Land Cover classes for the ES;
- Defining related ESS. Related ESS are classified referring to the Common International Classification of Ecosystem Services – CICES and listed in excel file.

PPs have been provided with:

- guidelines, as illustrated in the next paragraphs;
- tutorial which illustrates the methodological steps (see Appendix 1).

3.3.1.1. Mapping EcoSystems (ES)

The classification to define the ES is based on the EU Biodiversity 2010 Baseline approach implying that CORINE Land Cover (CLC) classes are aggregated into ecosystem types/EUNIS habitat classes (Maes et al., 2013 and 2014). Table 22 illustrates the correspondence between Corine Land Cover classes and ES types. Considering the characteristics of the NATURA 2000 sites which are the pilots of the project, and referring to Table 22, the habitat or better the homogeneous “ES types level 2” to consider are listed in Table 23.

Table 22: Correspondence between Corine Land Cover classes and ES types

CLC Level 1	CLC Level 2	CLC Level 3	Ecosystem types level 2
1. Artificial surfaces	1.1. Urban fabric	1.1.1. Continuous urban fabric	Urban
		1.1.2. Discontinuous urban fabric	
	1.2. Industrial, commercial and transport units	1.2.1. Industrial or commercial units	
		1.2.2. Road and rail networks and associated land	
		1.2.3. Port areas	
		1.2.4. Airports	
	1.3. Mine, dump and construction sites	1.3.1. Mineral extraction sites	
		1.3.2. Dump sites	
		1.3.3. Construction sites	
	1.4. Artificial non-agricultural vegetated areas	1.4.1. Green urban areas	
		1.4.2. Sport and leisure facilities	
2. Agricultural areas	2.1. Arable land	2.1.1. Non-irrigated arable land	Cropland
		2.1.2. Permanently irrigated land	
		2.1.3. Rice fields	
	2.2. Permanent crops	2.2.1. Vineyards	Cropland
		2.2.2. Fruit trees and berry plantations	
		2.2.3. Olive groves	
	2.3. Pastures	2.3.1. Pastures	Grassland
	2.4. Heterogeneous agricultural areas	2.4.1. Annual crops associated with permanent crops	Cropland
		2.4.2. Complex cultivation patterns	
		2.4.3. Land principally occupied by agriculture, with significant areas of natural vegetation	
		2.4.4. Agro-forestry areas	
3. Forests and semi-natural areas	3.1. Forests	3.1.1. Broad-leaved forest	Woodland and forest
		3.1.2. Coniferous forest	
		3.1.3. Mixed forest	
	3.2. Shrub and/or herbaceous vegetation association	3.2.1. Natural grassland	Grassland
		3.2.2. Moors and heathland	Heathland and shrub
		3.2.3. Sclerophyllous vegetation	
		3.2.4. Transitional woodland shrub	Woodland and forest
	3.3. Open spaces with little or no vegetation	3.3.1. Beaches, dunes, and sand plains	Sparsely vegetated land
		3.3.2. Bare rock	
		3.3.3. Sparsely vegetated areas	
		3.3.4. Burnt areas	
		3.3.5. Glaciers and perpetual snow	
4. Wetlands	4.1. Inland wetlands	4.1.1. Inland marshes	Wetlands
		4.1.2. Peatbogs	
	4.2. Coastal wetlands	4.2.1. Salt marshes	Marine inlets and transitional waters
		4.2.2. Salines	
		4.2.3. Intertidal flats	
5. Water bodies	5.1. Inland waters	5.1.1. Water courses	Rivers and lakes
		5.1.2. Water bodies	
	5.2. Marine waters	5.2.1. Coastal lagoons	Marine inlets and transitional waters
		5.2.2. Estuaries	
		5.2.3. Sea and ocean	Marine

Source: Maes et al., 2013

In order to convert the habitat classification system in Corine Land Cover Classes and then in ES types Level 2, the hierarchical system illustrated in Table 23 is suggested. To simplify the application of the methodological approach, PPs have been provided with a tutorial (Appendix 1).

Table 23: ES types

CLC Level 1	CLC Level 2	CLC Level 3	ES types Level 2
3. Forests and seminatural areas	3.2 Shrub and/or herbaceous vegetation association	3.2.1 Natural areas	Grassland
		3.2.2 Moors and heathland	Heathland and shrub
		3.2.3 Sclerophyllous vegetation	
		3.2.4 Transitional woodland shrub	Woodland and forest
4. Wetlands	4.1 Inland wetlands	4.1.1 Inland marshes	Wetlands
		4.1.2 Peatbogs	
	4.2 Coastal wetlands	4.2.1 Salt marshes	Marine inlets and transitional waters
		4.2.2 Salines	
		4.2.3 Intertidal flats	
5. Water bodies	5.2 Marine waters	5.2.1 Coastal lagoons	
		5.2.2 Estuaries	Marine
		5.2.3 Sea and ocean	

Source: Maes et al., 2013

3.3.1.2. Defining related EcoSystem Services (ESS)

Having defined ES, related ESS have to be selected. Several ESS classifications are available:

- The Millennium Ecosystem Assessment (MA, 2005),
- The Economics of ecosystems and Biodiversity (TEEB, 2010),
- The Common International Classification of Ecosystem Services (CICES). This classification is preferred to the previous ones because in the CICES ESS are either provided by living organisms (biota) or by a combination of living organisms and abiotic processes.

Table 24: Definition of the CICES sections

Provisioning	<p>This Section covers all nutritional, non-nutritional material and energetic outputs from living systems as well as abiotic outputs (including water).</p> <ul style="list-style-type: none"> • The Division level makes a distinction between biomass-based (biotic) provisioning services and the aqueous and non-aqueous abiotic ecosystem outputs.
Regulation and Maintenance	<p>All the ways in which living organisms can mediate or moderate the ambient environment that affects human health, safety or comfort, together with abiotic equivalents.</p> <ul style="list-style-type: none"> • The Division level therefore covers: <ul style="list-style-type: none"> • the ‘transformation of biochemical or physical inputs to ecosystems’ in the form of wastes, toxic substances and other nuisances; • the ‘regulation of physical, chemical, biological conditions, which categorizes the various ways in which living systems can mediate the physico-chemical and biological environment of people in a beneficial way.
Cultural	<p>All the non-material, and normally non-rival and non-consumptive, outputs of ecosystems (biotic and abiotic) that affect physical and mental states of people.</p> <ul style="list-style-type: none"> • Cultural services are primarily regarded as the environmental settings, locations or situations that give rise to changes in the physical or mental states of people, where the character of those settings is fundamentally dependent on living processes; they can involve individual species, habitats and whole ecosystems. • The settings can be semi-natural as well as natural settings (i.e. can include cultural landscapes) providing the characteristics being considered are dependent on <i>in-situ</i> living processes. • In the classification we make the distinction between cultural services that are enabled as a result of direct or indirect interactions of people and living systems.

Source: Haines-Young and Potschin, 2018

Nevertheless each classification groups the ESS into some main sections. The definition of the three sections is reported in Table 24.

CICES

The scope of CICES is to identify the final ESS. The structure of CICES is designed in a hierarchical way (Haines-Young and Potschin, 2018):

- Sections. At the highest level are the three categories: Provisioning, Regulation&Maintenance, and Cultural;
- Divisions, Groups, Classes and Class type are below.

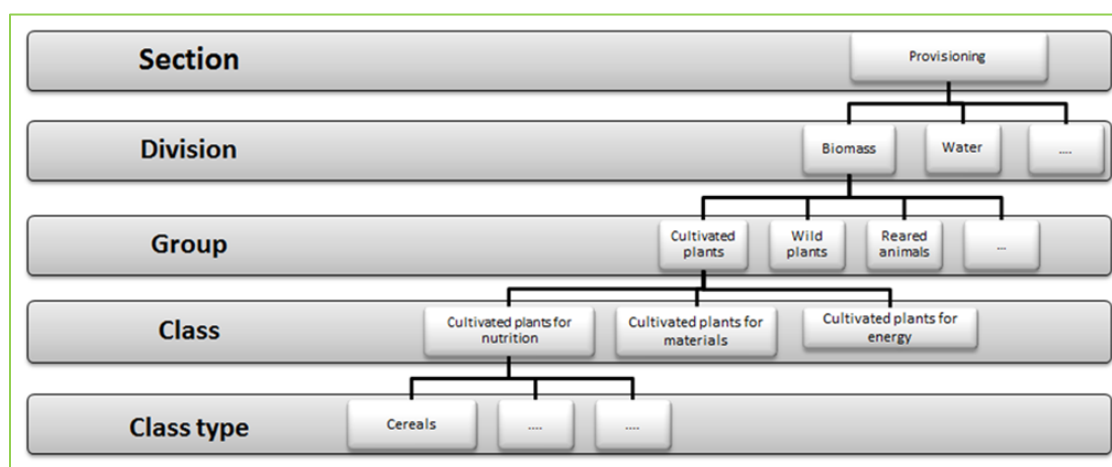


Figure 1: The hierarchical structure of CICES V5.1 (from Haines-Young and Potschin, 2018)

Figure 1 illustrates the hierarchical approach. With reference to the Provisioning service “cultivated plants” this category is subsequently disaggregated at class level as “Cultivated plants for nutrition” which the CICES v5.1 defines as “the ecological contribution to the growth of cultivated, land-based crops that can be harvested and used as raw material for the production of food”. Then at class type level it can be represented as “cereals, timbers, etc.”.

In this way, moving from Section through to Division, Group and Class, the ESS are increasingly more specific but remain nested within the broader categories that sit above them. This approach gives a sense of taxonomy in those elements within the same Group or Class. At any level in the hierarchy, the categories are intended to be exclusive so that CICES can be regarded as a classification system, rather than an arbitrary nomenclature.

Table 25, Table 26 and Table 27 list the ESS. The column “Marine CICES (relevance)” indicates if the ESS is relevant for marine ES. The CICES v.5.1 introduces abiotic ESS, which are listed in Table 28.

Table 25: ESS categories in MA, TEEB and CICES v5.1 for provisioning services

CICES				Marine CICES (relevance)	MA	TEEB
Section	Division	Group	Class			
Provi- sioning	Biomass	Cultivated terrestrial plants for nutrition, materials or energy	Cultivated terrestrial plants (including fungi, algae) grown for nutritional purposes	0	Food	Food
			Fibres and other materials from cultivated plants, fungi, algae and bacteria for direct use or processing (excluding genetic materials)	0	Fibre, Timber, Ornamental, Biochemical	Raw materials, medicinal resources
			Cultivated plants (including fungi, algae) grown as a source of energy	0		
		Cultivated aquatic plants for nutrition, materials or energy	Plants cultivated by in- situ aquaculture grown for nutritional purposes	1	Food	Food
			Fibres and other materials from in-situ aquaculture for direct use or processing (excluding genetic materials)	1	Fibre, Timber, Ornamental, Biochemical	Raw materials, medicinal resources
			Plants cultivated by in- situ aquaculture grown as an energy source	1		
		Reared animals for nutrition, materials or energy	Animals reared for nutritional purposes	0	Food	Food
			Fibres and other materials from reared animals for direct use or processing (excluding genetic materials)	0	Fibre, Timber, Ornamental, Biochemical	Raw materials, medicinal resources
			Animals reared to provide energy (including mechanical)	0		
		Reared aquatic animals for nutrition, materials or energy	Animals reared by in-situ aquaculture for nutritional purposes	1	Food	Food
			Fibres and other materials from animals grown by in-situ aquaculture for direct use or processing (excluding genetic materials)	1	Fibre, Timber, Ornamental, Biochemical	Raw materials, medicinal resources
			Animals reared by in-situ aquaculture as an energy source	1		
		Wild plants (terrestrial and aquatic) for nutrition, materials or energy	Wild plants (terrestrial and aquatic, including fungi, algae) used for nutrition	1	Food	Food
			Fibres and other materials from wild plants for direct use or processing (excluding genetic materials)	1	Fibre, Timber, Ornamental, Biochemical	Raw materials, medicinal resources
			Wild plants (terrestrial and aquatic, including fungi, algae) used as a source of energy	1		
		Wild animals (terrestrial and aquatic) for nutrition, materials or energy	Wild animals (terrestrial and aquatic) used for nutritional purposes	1	Food	Food
			Fibres and other materials from wild animals for direct use or processing (excluding genetic materials)	1	Fibre, Timber, Ornamental, Biochemical	Raw materials, medicinal resources
			Wild animals (terrestrial and aquatic) used as a source of energy	1		
	Genetic material from all biota including seed, spore or gamete production	Genetic material from plants, algae or fungi	Seeds, spores and other plant materials collected for maintaining or establishing a population	1	Genetic materials	Genetic materials
			Higher and lower plants (whole organisms) used to breed new strains or varieties	1		
			Individual genes extracted from higher and lower plants for the design and construction of new biological entities	1		
		Genetic material from animals	Animal material collected for the purposes of maintaining or establishing a population	1		
			Wild animals (whole organisms) used to breed new strains or varieties	1		
		Genetic material from organisms	Individual genes extracted from organisms for the design and construction of new biological entities	1		

Source: Haines-Young and Potschin, 2018

Table 26: ESS categories in MA, TEEB and CICES v5.1 for Regulation & Maintenance services

CICES				Marine CICES (relevance)	MA	TEEB	
Section	Division	Group	Class				
Regulation & Maintenance	Transfor-mation of biochemical or physical inputs to ecosystems	Mediation of wastes or toxic substances of anthropogenic origin by living processes	Bio-remediation by micro-organisms, algae, plants, and animals	1	Water purification and water treatment, air quality regulation	Waste treatment (water purification), air quality regulation	
			Filtration/sequestration/storage/accumulation by micro-organisms, algae, plants, and animals	1			
		Mediation of nuisances of anthropogenic origin	Smell reduction	1			
			Noise attenuation	0			
			Visual screening	1			
	Regulation of physical, chemical, biological conditions	Regulation of baseline flows and extreme events	Control of erosion rates	1	Erosion regulation	Erosion prevention	
			Buffering and attenuation of mass movement	1			
			Hydrological cycle and water flow regulation (Including flood control, and coastal protection)	1	Water regulation	Regulation of water flows, regulation of extreme events	
				Wind protection	0		Natural hazard regulation
				Fire protection	0		
		Lifecycle maintenance, habitat and gene pool protection	Pollination (or 'gamete' dispersal in a marine context)	1	Pollination	Pollination	
			Seed dispersal	1	No equivalent		
			Maintaining nursery populations and habitats (Including gene pool protection)	1			
		Pest and disease control	Pest control (including invasive species)	1	Pest regulation	Biological control	
			Disease control	1	Disease regulation		
		Regulation of soil quality	Weathering processes and their effect on soil quality	0	Soil formation (supporting service)	Maintenance of soil fertility	
			Decomposition and fixing processes and their effect on soil quality	1			
		Water conditions	Regulation of the chemical condition of freshwaters by living processes	0	Water regulation	Water	
			Regulation of the chemical condition of salt waters by living processes	1			
		Atmospheric composition and conditions	Regulation of chemical composition of atmosphere and oceans	1	Atmospheric regulation	Climate regulation	
			Regulation of temperature and humidity, including ventilation and transpiration	1			

Source: Haines-Young and Potschin, 2018

Table 27: ESS categories in MA, TEEB and CICES v5.1 for Cultural services

Section	Division	CICES		Marine CICES (relevance)	MA	TEEB
		Group	Class			
Cultural	Direct, in-situ and outdoor interactions with living systems that depend on presence in the environmental setting	Physical and experiential interactions with natural environment	Characteristics of living systems that enable activities promoting health, recuperation or enjoyment through active or immersive interactions	1	Recreation and ecotourism	Recreation and ecotourism
			Characteristics of living systems that enable activities promoting health, recuperation or enjoyment through passive or observational interactions	1		
		Intellectual and representative interactions with natural environment	Characteristics of living systems that enable scientific investigation or the creation of traditional ecological knowledge	1	Knowledge systems and educational values, cultural diversity, aesthetic values	Information and cognitive development
			Characteristics of living systems that enable education and training	1		Inspiration for culture, art and design, aesthetic
			Characteristics of living systems that are resonant in terms of culture or heritage	1		
			Characteristics of living systems that enable aesthetic experiences	1		

CICES				Marine CICES (relevance)	MA	TEEB
Section	Division	Group	Class			
						information
	Indirect, remote, often indoor interactions with living systems that do not require presence in the environmental setting	Spiritual, symbolic and other interactions with natural environment	Elements of living systems that have symbolic meaning	1	Spiritual and religious values	Inspiration for culture, art and design, aesthetic information
			Elements of living systems that have sacred or religious meaning	1		
			Elements of living systems used for entertainment or representation	1		

Source: Haines-Young and Potschin, 2018

Table 28: Abiotic ESS

CICES			
Section	Division	Group	Class
Provisioning (Abiotic)	Water	Surface water used for nutrition, materials or energy	Surface water for drinking
			Surface water used as a material (non-drinking purposes)
			Freshwater surface water used as an energy source
			Coastal and marine water used as energy source
		Ground water for used for nutrition, materials or energy	Ground (and subsurface) water for drinking
			Ground water (and subsurface) used as a material (non-drinking purposes)
	Ground water (and subsurface) used as an energy source		
	Non-aqueous natural abiotic ecosystem outputs	Mineral substances used for nutrition, materials or energy	Mineral substances used for nutritional purposes
			Mineral substances used for material purposes
			Mineral substances used for as an energy source
		Non-mineral substances or ecosystem properties used for nutrition, materials or energy	Non-mineral substances or ecosystem properties used for nutritional purposes
			Non-mineral substances used for materials
Wind energy			
Solar energy			
Geothermal			
Regulation & Maintenance (Abiotic)	Transformation of biochemical or physical inputs to ecosystems	Mediation of waste, toxics and other nuisances by non-living processes	Dilution by freshwater and marine ecosystems
			Dilution by atmosphere
			Mediation by other chemical or physical means (e.g. via Filtration, sequestration, storage or accumulation)
		Mediation of nuisances of anthropogenic origin	Mediation of nuisances by abiotic structures or processes
	Regulation of physical, chemical, biological conditions	Regulation of baseline flows and extreme events	Mass flows
			Liquid flows
			Gaseous flows
		Maintenance of physical, chemical, abiotic conditions	Maintenance and regulation by inorganic natural chemical and physical processes
		Cultural (Abiotic)	Direct, in-situ and outdoor interactions with natural physical systems that depend on presence in the env. setting
Intellectual and representative interactions with abiotic components of the natural environment	Natural, abiotic characteristics of nature that enable intellectual interactions		
Indirect, remote, often indoor interactions with physical systems that do not require presence in the env. setting	Spiritual, symbolic and other interactions with the abiotic components of the natural environment		Natural, abiotic characteristics of nature that enable spiritual, symbolic and other interactions
	Other abiotic characteristics that have a non-use value		Natural, abiotic characteristics or features of nature that have either an existence, option or bequest value

Source: Haines-Young and Potschin, 2018

3.3.2. Results

Table 29 synthetizes the activities carried out by PPs.

Table 29: Activities carried out by PPs

Activities	LP	PP2	PP3	PP4	PP5	PP6	PP7
Activity T1.1 - Mapping and assessing of Eco-System							
Mapping EcoSystems (ES)							
<i>Marine EcoSystems</i>	X	X	X	X	X	X	X
<i>Terrestrial EcoSystems</i>	X	X	X	X	X	X	X
Defining related EcoSystem Services (ESS)							
<i>Marine EcoSystems</i>	X	X	X	X	X	X	X
<i>Terrestrial EcoSystems</i>	X	X	X	X	X	X	X

Partner	Name of the organization in original language	Name of the organization in English
LP	Comune di Staranzano Staranzano	Municipality of Staranzano
PP2	Veneto Agricoltura - Azienda Regionale per i Settori Agricolo Forestale e Agroalimentare	Veneto Agricoltura – Regional Agency for Agriculture, Forestry and Agri-food Sectors
PP3	Università del Salento – Dipartimento di Scienze e Tecnologie Biologiche ed Ambientali	Department of Biological and Environmental Science and Technologies
PP4	Društvo za opazovanje in proučevanje ptic Slovenije	DOPPS-BirdLife Slovenia
PP5	Javna ustanova za upravljanje zaštićenim dijelovima prirode na području Splitsko-dalmatinske županije "More i krš"	Public Institution for the Management of Protected Areas in the County of Split and Dalmatia "Sea and Karst"
PP6	Fondi Shqiptar I Zhvillimit	Albanian Development Fund
PP7	ΠΕΡΙΦΕΡΕΙΑ ΚΡΗΤΗΣ	Region of Crete

3.3.2.1 Mapping EcoSystems (ES)

In the next pages a synthetic card of the N2K sites referring to:

- List of EcoSystems and related hectares,
- EcoSystems in percentage,
- Map of EcoSystems.

LP – Municipality of Staranzano

The following Table 30, Figure 2 and Figure 3 synthesize the results of the analysis.

Table 30: List of ES and related hectares in RNFI

Ecosystem class 2	hectares
Cropland	542,01
Grassland	87,92
Heatland and shrub	3,60
Marine	1.194,94
Marine inlets and transitional waters	499,96
Rivers and Lakes	99,35
Sparsely vegetated areas	29,76
Urban	53,94
Wetlands	50,67
Woodland and Forest	106,06
Total	2.668,21

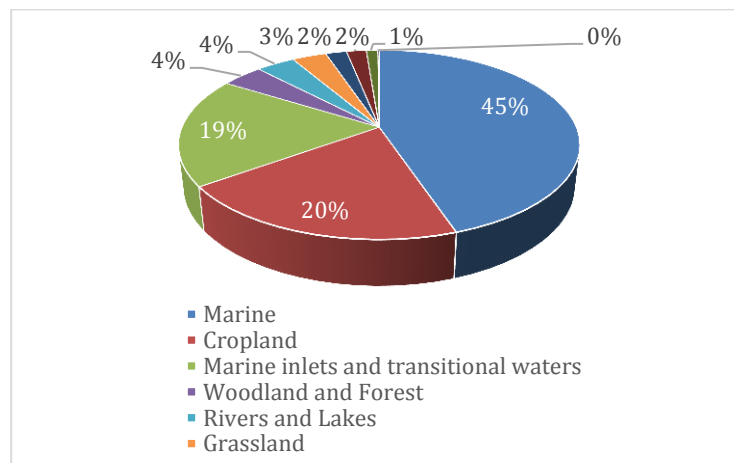


Figure 2: EcoSystems in RNFI

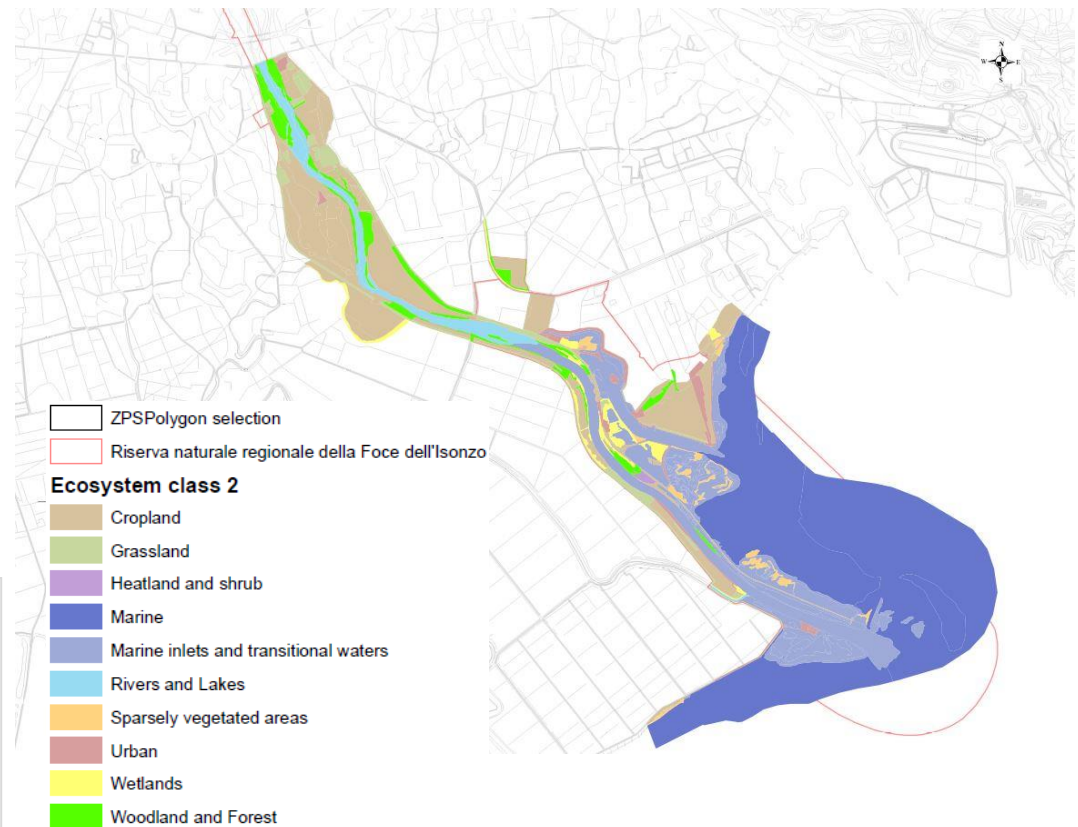


Figure 3: Map of EcoSystems in RNFI

PP2 – Veneto Agricoltura – Regional Agency for Agriculture, Forestry and Agri-food Sectors

The following Table 31, Figure 4 and Figure 5 synthetize the results of the analysis IN Bosco Nordio (BN). The pilot area of PP2 is characterized by terrestrial ES. Marine ES are located at about 3 km from the N2K site.

Table 31: List of ES and related hectares in BN

Ecosystem class 2	hectares
Woodland and forest	132,91
Cropland	13,43
Urban	3,56
Sparsely vegetated areas	3,13
Grassland	1,71
Sparsely vegetated areas	1,65
Wetlands	0,54
Hearthland and shrub	0,07
Total	157,00

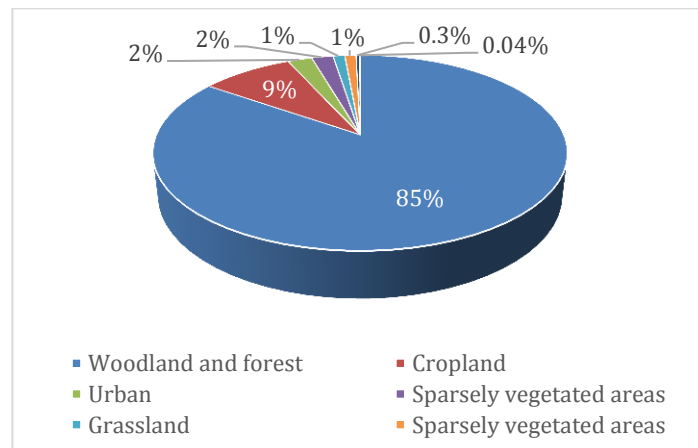


Figure 4: EcoSystems in BN

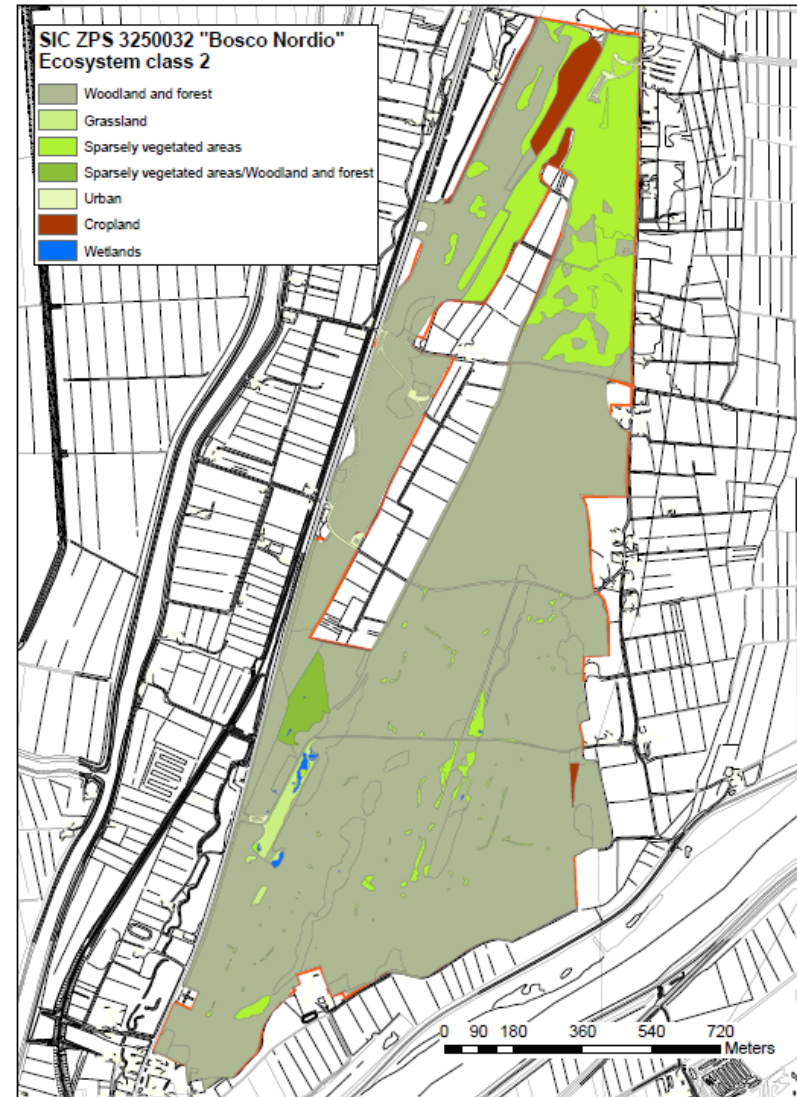


Figure 5: Map of EcoSystems BN

PP3 – University of Salento, Department of Biological and Environmental Science and Technologies

The following Table 32, Figure 6 and Figure 7 synthetize the results of the analysis in Aquatina di Frigole (AF).

Table 32: List of ES and related hectares in AF

Ecosystem class 2	hectares
Posidonia beds	2214,1
Coastal lagoons	52,40
Annual vegetation of drift lines	158,15
Salt pioneer swards	0,40
Mediterranean and thermo-Atlantic halophilous scrubs	158,15
Shifting dunes along the shoreline with <i>Ammophila arenaria</i>	63,26
Coastal dunes with <i>Juniperus</i> spp.	11,10
Cisto-Lavenduletalia dune sclerophyllous scrubs	11,10

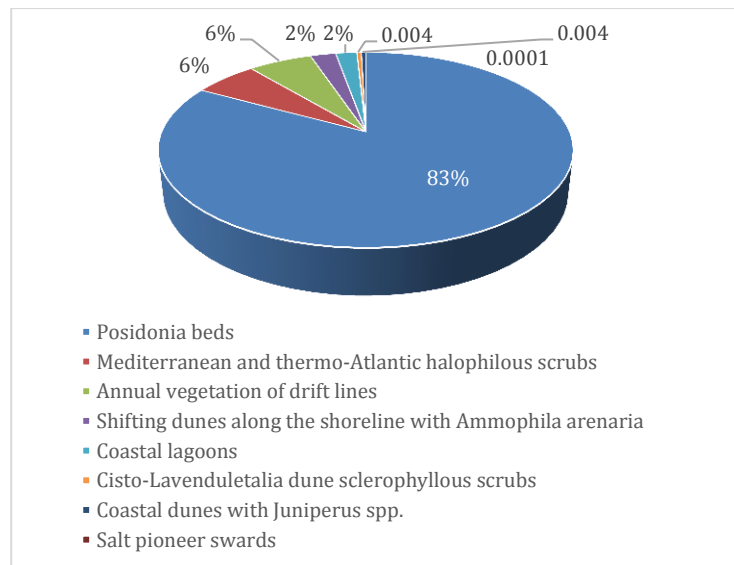


Figure 6: EcoSystems in AF

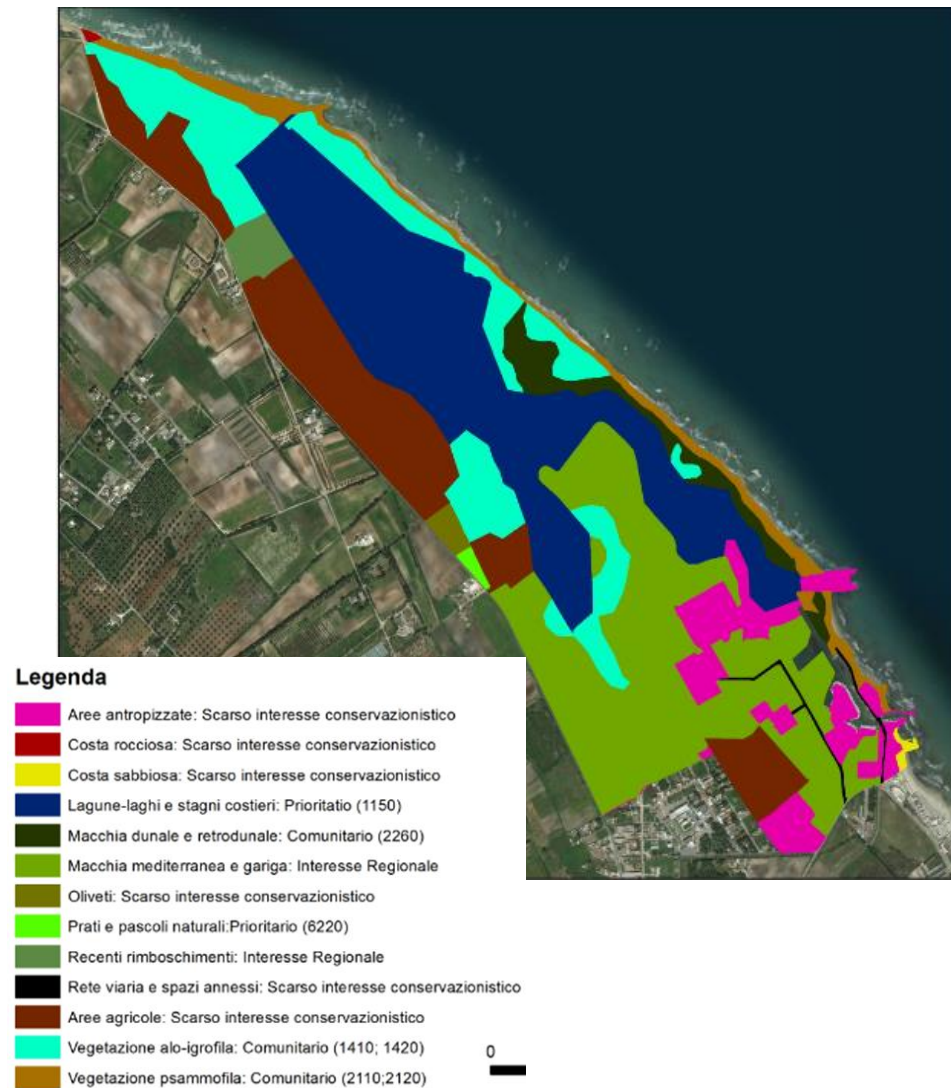


Figure 7: Map of EcoSystems in AF

PP4 – DOPPS-BirdLife Slovenia

The following Table 33 and Figure 8 and Figure 9 synthetize the results of the analysis in Nature Reserve Škocjanski zatok (NRSZ).

Table 33: List of ES and related hectares in NRSZ

Ecosystem class 2	hectares
Marine inlets and transitional waters	71,79
Wetlands	28,00
Rivers and Lakes	1,50
Forests and semi-natural areas	3,00
Croplands	2,30
Grassland	10,60
Urban	5,00
Total	122,19

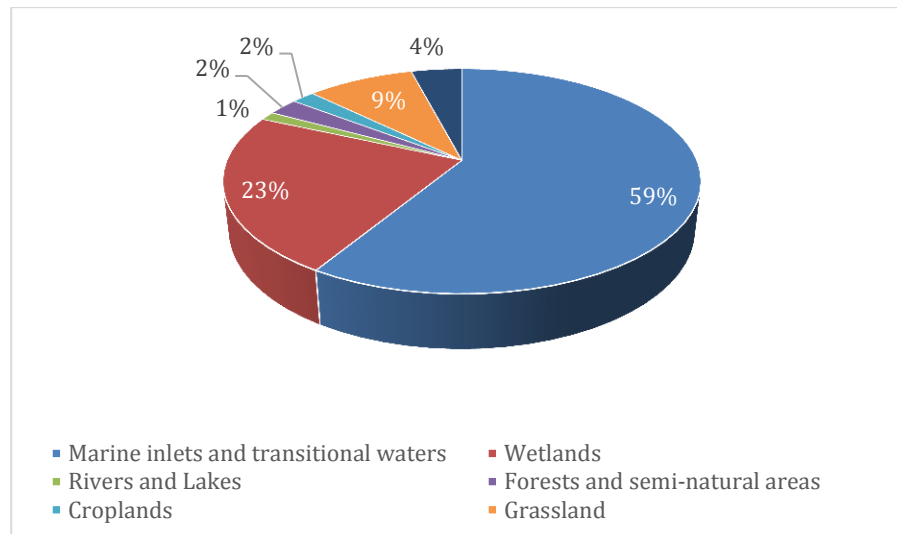


Figure 8: EcoSystems in in NRSZ

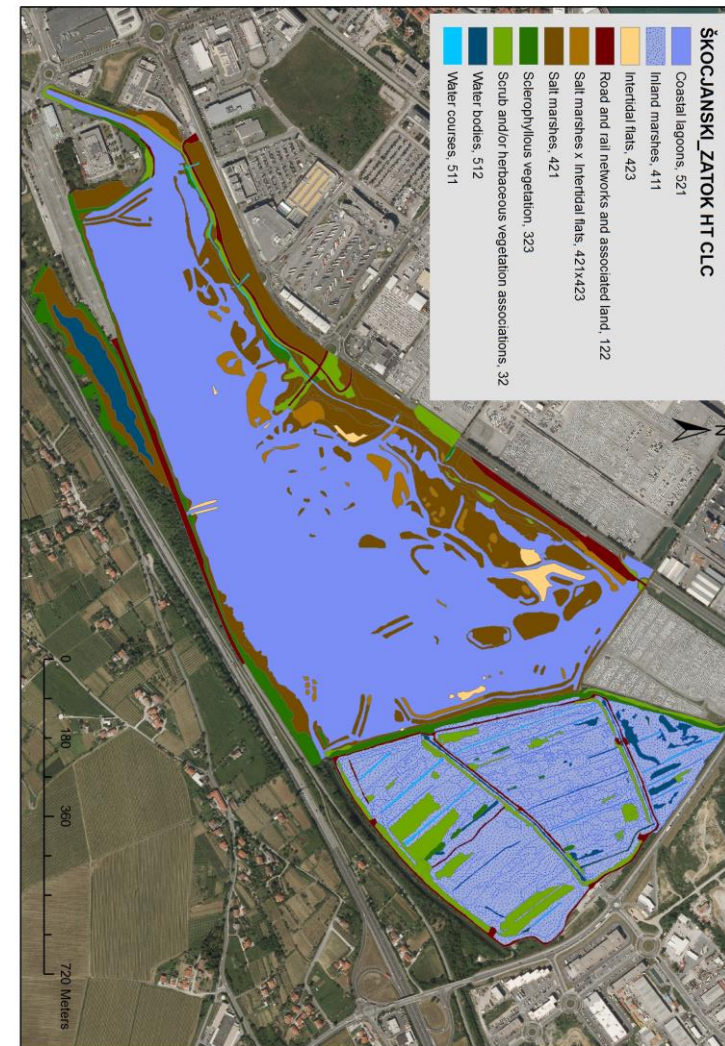


Figure 9: Map of EcoSystems in NRSZ

PP5 – Public Institution for the Management of Protected Areas in the County of Split and Dalmatia “Sea and Karst”

The following Table 34, Figure 10 and Figure 11 synthetize the results of the analysis in Pakleni Island (PI).

Table 34: List of ES and related hectares in PI

Corine Land Cover Class 2	hectares
Open spaces with little or no vegetation	92,41
Forests	128,86
Shrub and/or herbaceous vegetation association	432,47
Permanent crops	8,87
Urban fabric	5,85
Marine waters	1253,00
	1921,45

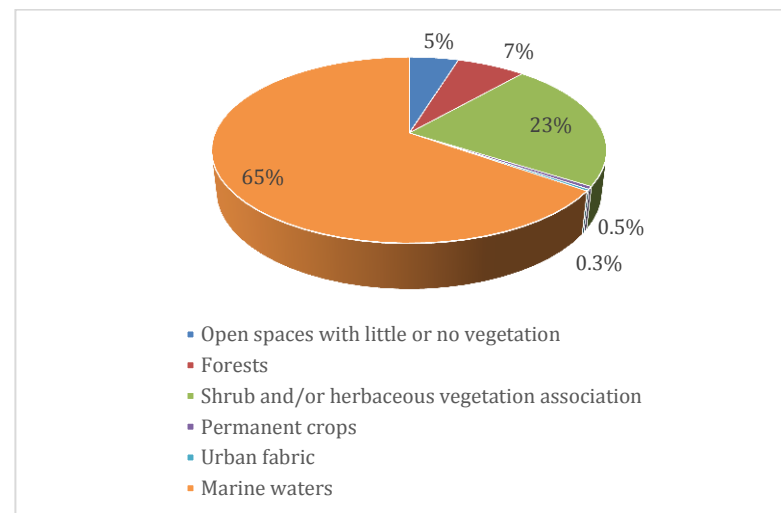


Figure 10: EcoSystems in PI

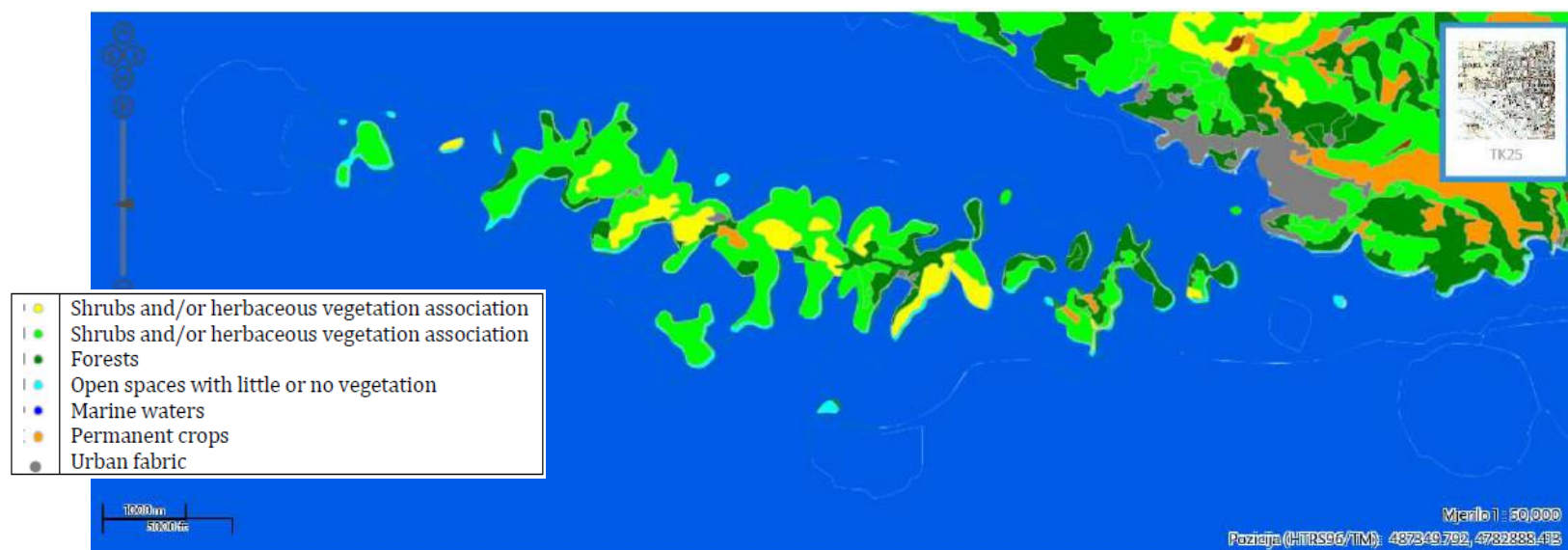


Figure 11: Map of EcoSystems in PI

PP6 – Albanian Development Fund

Figure 12 synthetizes the results of the analysis in Shkodra Lake and Buna Delta (SLBD). Data about habitat are not available.

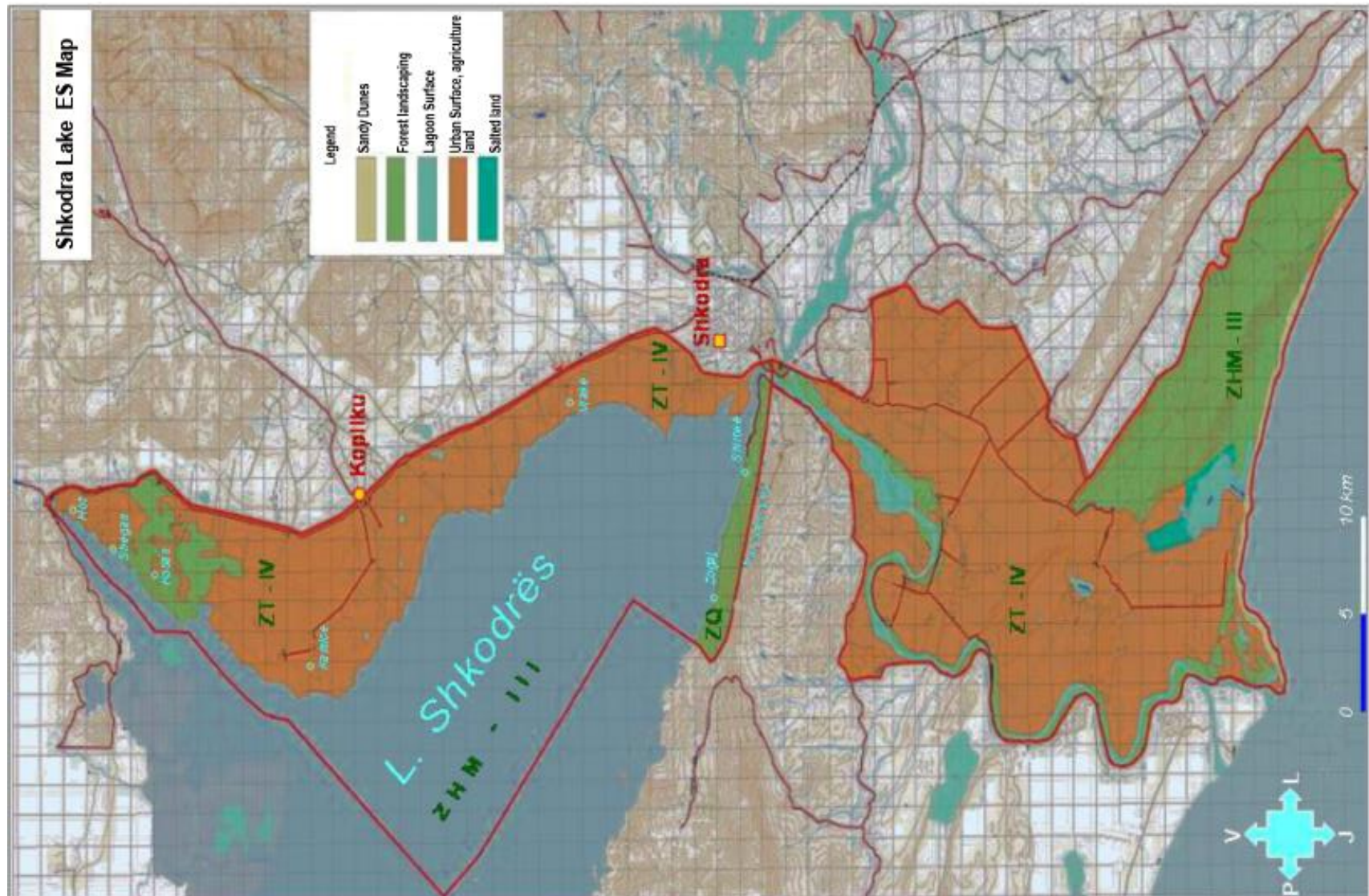


Figure 12: Map of EcoSystems in SLBD

PP7 – Region of Crete

The following Table 35, Figure 13 and Figure 14 synthetizes the results of the analysis in North-Eastern Edge of Crete (NEEC).

Table 36: List of ES and related hectares in NEEC

Ecosystems Class 2	hectares
Grassland	39,77
Heathland and shrub	5.545,08
Marine	2.960,00
Marine inlets and transitional waters	23.606,53
Rivers and lakes	0,96
Sparsely vegetated areas	375,27
Wetlands	0,38
Woodland and Forest	83,84
Totale complessivo	32.611,83

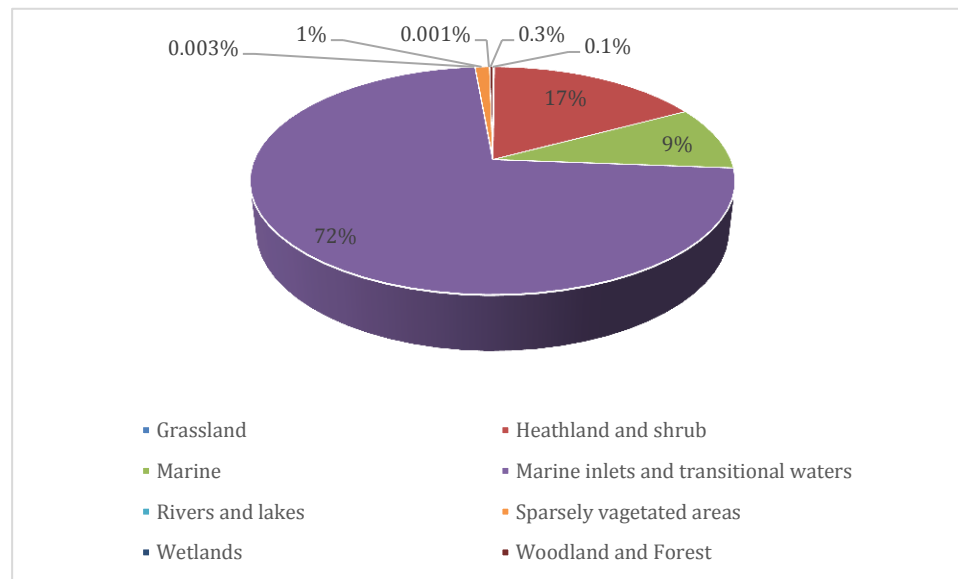


Figure 14: EcoSystems in NEEC

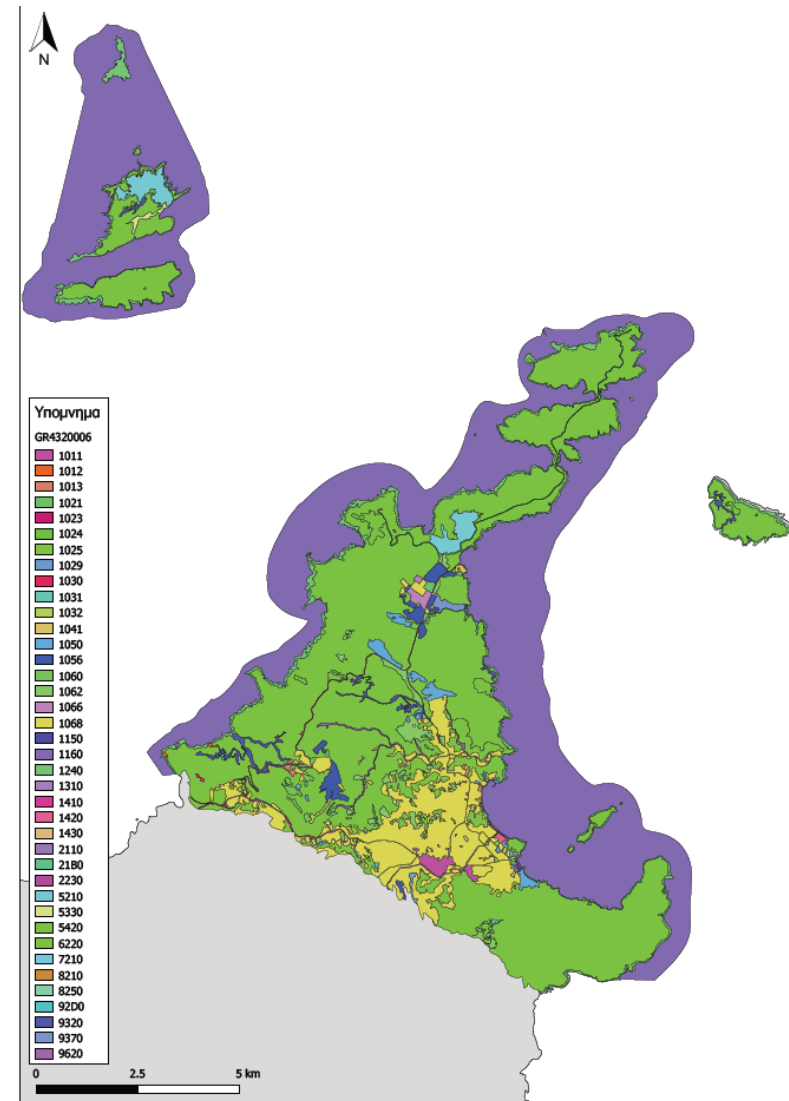


Figure 15: Map of EcoSystems in NEEC

3.3.2.2 Defining related EcoSystem Services (ESS)

Referring to Table 36 and Table 37, it appears clearly that N2K sites provide several ESS related to the categories:

- Regulation & Maintenance, and
- Cultural, both biotic and abiotic and both marine and terrestrial ES.

On this base we can expect to have pilots related to Regulation & Maintenance and Cultural ESS.

Table 36: EcoSystem Services provided by marine EcoSystems of N2K project sites

ECOSYSTEM SERVICES				Complies with THE pilot area (Y/N)						
Section of ESS	Division of ESS	Group of ESS	Ecosystem Service Class	LP	PP2	PP3	PP4	PP5	PP6	PP7
Provisioning	Biomass	Cultivated aquatic plants for nutrition, materials or energy	Plants cultivated by in-situ aquaculture grown for nutritional purposes	N	n.a.	Y	N	N	N	N
			Fibres and other materials from in-situ aquaculture for direct use or processing (excluding genetic materials)	N	n.a.	N	N	N	N	N
			Plants cultivated by in-situ aquaculture grown as an energy source	N	n.a.	N	N	N	N	N
		Reared aquatic animals for nutrition, materials or energy	Animals reared by in-situ aquaculture for nutritional purposes	N	n.a.	Y	N	N	N	N
			Fibres and other materials from animals grown by in-situ aquaculture for direct use or processing (excluding genetic materials)	N	n.a.	N	N	N	N	N
			Animals reared by in-situ aquaculture as an energy source	N	n.a.	N	N	N	N	N
		Wild plants (terrestrial and aquatic) for nutrition, materials or energy	Wild plants (terrestrial and aquatic, including fungi, algae) used for nutrition	N	n.a.	N	N	N	N	N
			Fibres and other materials from wild plants for direct use or processing (excluding genetic materials)	N	n.a.	N	N	N	N	N
			Wild plants (terrestrial and aquatic, including fungi, algae) used as a source of energy	N	n.a.	N	N	N	N	N
		Wild animals (terrestrial and aquatic) for nutrition, materials or energy	Wild animals (terrestrial and aquatic) used for nutritional purposes	Y	n.a.	Y	N	Y	N	Y
			Fibres and other materials from wild animals for direct use or processing (excluding genetic materials)	N	n.a.	N	N	N	N	N
			Wild animals (terrestrial and aquatic) used as a source of energy	N	n.a.	Y	N	N	N	N
	Genetic material from all biota (including seed, spore or gamete production)	Genetic material from plants, algae or fungi	Seeds, spores and other plant materials collected for maintaining or establishing a population	N	n.a.	Y	N	N	N	N
			Higher and lower plants (whole organisms) used to breed new strains or varieties	N	n.a.	Y	N	N	N	N
			Individual genes extracted from higher and lower plants for the design and construction of new biological entities	N	n.a.	N	N	N	N	N
		Genetic material from animals	Animal material collected for the purposes of maintaining or establishing a population	N	n.a.	Y	N	N	N	N
			Wild animals (whole organisms) used to breed new strains or varieties	N	n.a.	Y	N	N	N	N
			Individual genes extracted from organisms for the design and construction of new biological entities	N	n.a.	Y	N	N	N	N
Regulation & Maintenance (Biotic)	Transformation of biochemical or physical inputs to ecosystems	Mediation of wastes or toxic substances of anthropogenic origin by living processes	Bio-remediation by micro-organisms, algae, plants, and animals	Y	n.a.	Y	N	Y	Y	N
			Filtration/sequestration/storage/accumulation by micro-organisms, algae, plants, and animals	Y	n.a.	Y	N	Y	Y	N
		Mediation of nuisances of anthropogenic origin	Smell reduction	Y	n.a.	Y	N	Y	Y	N
			Visual screening	N	n.a.	Y	Y	N	Y	N
	Regulation of physical, chemical, biological conditions	Regulation of baseline flows and extreme events	Control of erosion rates	Y	n.a.	Y	N	Y	Y	Y
			Buffering and attenuation of mass movement	N	n.a.	Y	N	Y	Y	Y
			Hydrological cycle and water flow regulation (Including flood control, and coastal protection)	Y	n.a.	Y	Y	Y	Y	Y
			Pollination (or 'gamete' dispersal in a marine context)	Y	n.a.	N	N	Y	Y	Y
		Lifecycle maintenance, habitat and gene pool protection	Seed dispersal	Y	n.a.	Y	N	Y	Y	Y
			Maintaining nursery populations and habitats (Including gene pool protection)	Y	n.a.	Y	Y	Y	Y	Y
			Pest control (including invasive species)	N	n.a.	Y	N	Y	N	N
		Pest and disease control	Disease control	N	n.a.	Y	N	N	N	N
			Decomposition and fixing processes and their effect on soil quality	N	n.a.	N	N	N	N	Y
		Water conditions	Regulation of the chemical condition of salt waters by living processes	Y	n.a.	Y	N	Y	N	Y
		Atmospheric composition and conditions	Regulation of chemical composition of atmosphere and oceans	Y	n.a.	Y	Y	Y	Y	Y
			Regulation of temperature and humidity, including ventilation and transpiration	Y	n.a.	Y	Y	N	Y	Y
Cultural	Direct, in-situ and outdoor interactions with environment	Physical and experiential interactions with natural environment	Characteristics of living systems that enable activities promoting health, recuperation or enjoyment through active or immersive interactions	Y	n.a.	Y	Y	Y	Y	Y
			Characteristics of living systems that enable activities promoting health, recuperation or enjoyment	Y	n.a.	Y	Y	Y	Y	Y

ECOSYSTEM SERVICES				Complies with THE pilot area (Y/N)						
Section of ESS	Division of ESS	Group of ESS	Ecosystem Service Class	LP	PP2	PP3	PP4	PP5	PP6	PP7
	living systems that depend on presence in the environmental setting	Intellectual and representative interactions with natural environment	through passive or observational interactions							
			Characteristics of living systems that enable scientific investigation or the creation of traditional ecological knowledge	Y	n.a.	Y	Y	Y	Y	Y
			Characteristics of living systems that enable education and training	Y	n.a.	Y	Y	Y	Y	Y
			Characteristics of living systems that are resonant in terms of culture or heritage	Y	n.a.	Y	Y	Y	Y	Y
			Characteristics of living systems that enable aesthetic experiences	Y	n.a.	Y	Y	Y	Y	Y
	Indirect, remote, often indoor interactions in the environment	Spiritual, symbolic and other interactions with natural environment	Elements of living systems that have symbolic meaning	N	n.a.	Y	Y	Y	Y	Y
			Elements of living systems that have sacred or religious meaning	N	n.a.	Y	N	N	N	Y
			Elements of living systems used for entertainment or representation	Y	n.a.	Y	Y	Y	Y	Y
		Other biotic characteristics that have a non-use value	Characteristics or features of living systems that have an existence value	Y	n.a.	N	Y	Y	Y	Y
			Characteristics or features of living systems that have an option or bequest value	Y	n.a.	N	Y	Y	Y	Y
Provisioning (Abiotic)	Water	Surface water used for nutrition, materials or energy	Surface water for drinking	N	n.a.	N	N	N	N	N
			Surface water used as a material (non-drinking purposes)	N	n.a.	Y	N	N	Y	N
			Freshwater surface water used as an energy source	N	n.a.	N	N	N	N	N
			Coastal and marine water used as energy source	N	n.a.	N	N	N	N	N
		Ground water for used for nutrition, materials or energy	Ground (and subsurface) water for drinking	N	n.a.	N	N	N	N	N
			Ground water (and subsurface) used as a material (non-drinking purposes)	N	n.a.	N	N	N	Y	N
			Ground water (and subsurface) used as an energy source	N	n.a.	N	N	N	N	N
	Non-aqueous natural abiotic ecosystem outputs	Mineral substances used for nutrition, materials or energy	Mineral substances used for nutritional purposes	N	n.a.	N	N	Y	N	N
			Mineral substances used for material purposes	N	n.a.	N	N	N	N	N
			Mineral substances used for as an energy source	N	n.a.	N	N	N	N	N
		Non-mineral substances or ecosystem properties used for nutrition, materials or energy	Non-mineral substances or ecosystem properties used for nutritional purposes	Y	n.a.	Y	N	Y	Y	N
			Non-mineral substances used for materials	N	n.a.	N	N	N	N	N
			Wind energy	N	n.a.	N	N	N	N	N
			Solar energy	Y	n.a.	N	Y	N	N	N
			Geothermal	N	n.a.	N	N	N	N	N
Regulation & Maintenance (Abiotic)	Transformation of biochemical or physical inputs to ecosystems	Mediation of waste, toxics and other nuisances by non-living processes	Dilution by freshwater and marine ecosystems	N	n.a.	Y	N	Y	Y	Y
			Dilution by atmosphere	Y	n.a.	N	N	N	Y	n.a.
			Mediation by other chemical or physical means (e.g. via Filtration, sequestration, storage or accumulation)	Y	n.a.	Y	N	Y	Y	n.a.
		Mediation of nuisances of anthropogenic origin	Mediation of nuisances by abiotic structures or processes	N	n.a.	Y	Y	N	Y	n.a.
	Regulation of physical, chemical, biological conditions	Regulation of baseline flows and extreme events	Mass flows	Y	n.a.	Y	N	Y	Y	n.a.
			Liquid flows	N	n.a.	Y	Y	Y	Y	n.a.
			Gaseous flows	Y	n.a.	Y	N	N	Y	n.a.
		Maintenance of physical, chemical, abiotic conditions	Maintenance and regulation by inorganic natural chemical and physical processes	Y	n.a.	Y	N	Y	Y	n.a.
Cultural (Abiotic)	Direct, in-situ and outdoor interactions in the environment	Physical and experiential interactions with natural abiotic components of the environment	Natural, abiotic characteristics of nature that enable active or passive physical and experiential interactions	N	n.a.	Y	Y	Y	N	n.a.
		Intellectual and representative interactions with abiotic components of the natural environment	Natural, abiotic characteristics of nature that enable intellectual interactions	N	n.a.	Y	Y	Y	N	n.a.

<u>ECOSYSTEM SERVICES</u>				Complies with THE pilot area (Y/N)						
Section of ESS	Division of ESS	Group of ESS	Ecosystem Service Class	LP	PP2	PP3	PP4	PP5	PP6	PP7
	Indirect, remote, often indoor interactions in the environment	Spiritual, symbolic and other interactions with the abiotic components of the natural environment	Natural, abiotic characteristics of nature that enable spiritual, symbolic and other interactions	N	n.a.	Y	Y	Y	N	n.a.
		Other abiotic characteristics that have a non-use value	Natural, abiotic characteristics or features of nature that have either an existence, option or bequest value	Y	n.a.	Y	Y	Y	Y	n.a.

Table 37: EcoSystem Services provided by terrestrial EcoSystems of N2K project sites

ECOSYSTEM SERVICES				Complies with THE pilot area (Y/N)						
Section	Division	Group	Ecosystem Service Class	LP	PP2	PP3	PP4	PP5	PP6	PP7
Provisioning (biotic)	Biomass	Cultivated terrestrial plants for nutrition, materials or energy	Cultivated terrestrial plants (including fungi, algae) grown for nutritional purposes	Y	N	N	N	Y	Y	Y
			Fibres and other materials from cultivated plants, fungi, algae and bacteria for direct use or processing (excluding genetic materials)	N	N	N	N	N	N	N
			Cultivated plants (including fungi, algae) grown as a source of energy	Y	N	N	N	N	N	N
		Cultivated aquatic plants for nutrition, materials or energy	Plants cultivated by in- situ aquaculture grown for nutritional purposes	N	N	Y	N	N	N	N
			Fibres and other materials from in-situ aquaculture for direct use or processing (excluding genetic materials)	N	N	Y	N	N	N	N
			Plants cultivated by in- situ aquaculture grown as an energy source	N	N	Y	N	N	N	N
		Reared animals for nutrition, materials or energy	Animals reared for nutritional purposes	N	Y	N	N	Y	N	Y
			Fibres and other materials from reared animals for direct use or processing (excluding genetic materials)	N	N	N	N	Y	N	Y
			Animals reared to provide energy (including mechanical)	Y	Y	N	N	N	N	N
		Reared aquatic animals for nutrition, materials or energy	Animals reared by in-situ aquaculture for nutritional purposes	N	N	Y	N	N	N	N
			Fibres and other materials from animals grown by in-situ aquaculture for direct use or processing (excluding genetic materials)	N	N	Y	N	N	N	N
			Animals reared by in-situ aquaculture as an energy source	N	N	N	N	N	N	N
		Wild plants (terrestrial and aquatic) for nutrition, materials or energy	Wild plants (terrestrial and aquatic, including fungi, algae) used for nutrition	N	Y	Y	N	Y	N	Y
			Fibres and other materials from wild plants for direct use or processing (excluding genetic materials)	N	N	Y	Y	Y	N	N
			Wild plants (terrestrial and aquatic, including fungi, algae) used as a source of energy	N	Y	N	N	Y	Y	N
		Wild animals (terrestrial and aquatic) for nutrition, materials or energy	Wild animals (terrestrial and aquatic) used for nutritional purposes	Y	N	Y	N	Y	N	Y
			Fibres and other materials from wild animals for direct use or processing (excluding genetic materials)	N	N	N	N	Y	N	N
			Wild animals (terrestrial and aquatic) used as a source of energy	N	N	N	N	N	N	N
	Genetic material from all biota (including seed, spore or gamete production)	Genetic material from plants, algae or fungi	Seeds, spores and other plant materials collected for maintaining or establishing a population	Y	Y	Y	N	Y	Y	N
			Higher and lower plants (whole organisms) used to breed new strains or varieties	N	N	Y	N	N	N	N
			Individual genes extracted from higher and lower plants for the design and construction of new biological entities	N	N	Y	N	N	N	N
		Genetic material from animals	Animal material collected for the purposes of maintaining or establishing a population	N	Y	Y	N	N	N	N
			Wild animals (whole organisms) used to breed new strains or varieties	N	N	Y	N	N	N	N
			Individual genes extracted from organisms for the design and construction of new biological entities	N	N	Y	N	N	N	N
Regulation & Maintenance (Biotic)	Transformation of biochemical or physical inputs to ecosystems	Mediation of wastes or toxic substances of anthropogenic origin by living processes	Bio-remediation by micro-organisms, algae, plants, and animals	N	N	Y	Y	Y	Y	N
			Filtration/sequestration/storage/accumulation by micro-organisms, algae, plants, and animals	Y	N	Y	Y	Y	Y	N
		Mediation of nuisances of anthropogenic origin	Smell reduction	Y	N	Y	N	Y	Y	N
			Noise attenuation	N	Y	Y	Y	Y	Y	N
			Visual screening	Y	Y	Y	Y	Y	Y	N
			Control of erosion rates	Y	N	Y	N	Y	Y	Y
	Regulation of physical, chemical, biological conditions	Regulation of baseline flows and extreme events	Buffering and attenuation of mass movement	N	N	Y	N	N	N	Y
			Hydrological cycle and water flow regulation (Including flood control, and coastal protection)	Y	N	Y	Y	N	Y	Y
			Wind protection	Y	Y	N	N	Y	Y	N
			Fire protection	N	Y	N	N	N	Y	N
		Lifecycle maintenance, habitat and gene pool	Pollination (or 'gamete' dispersal in a marine context)	Y	Y	Y	Y	Y	Y	Y
			Seed dispersal	Y	Y	Y	Y	Y	Y	Y

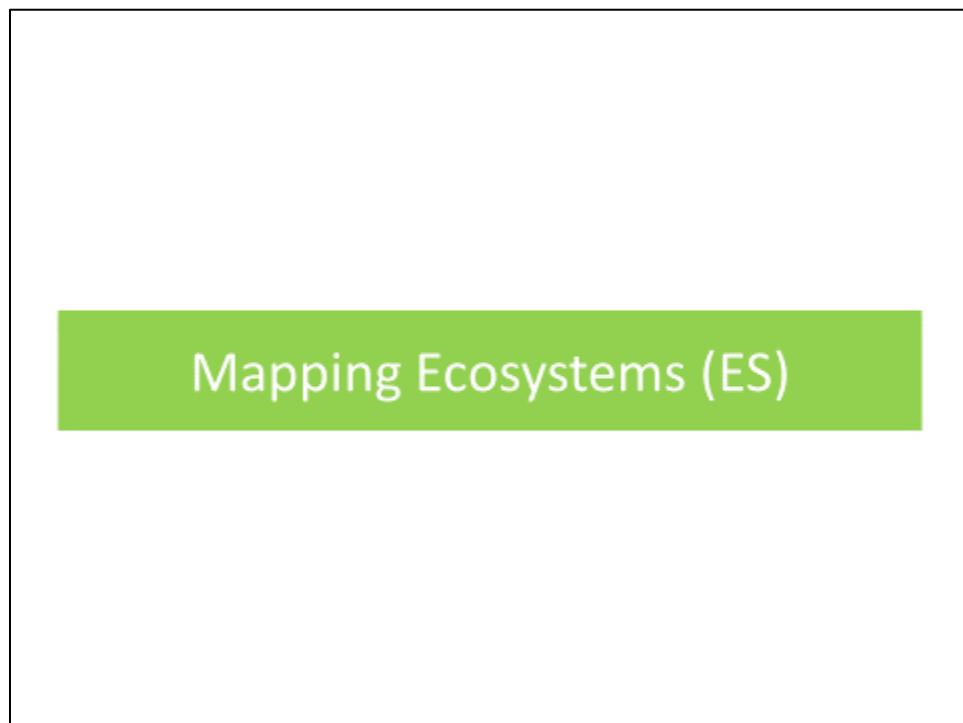
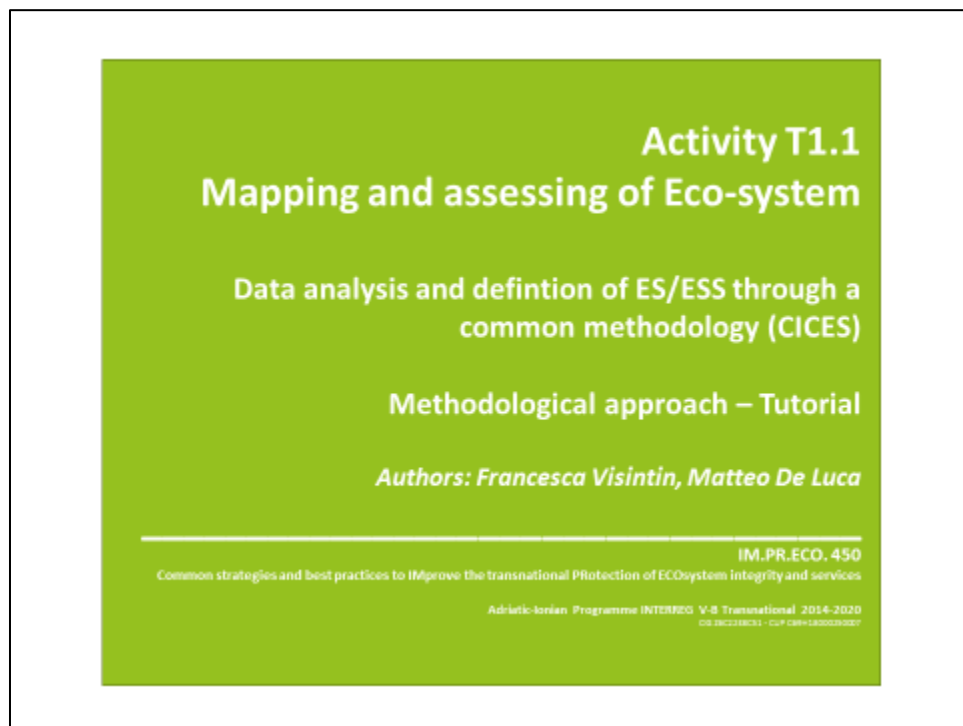
ECOSYSTEM SERVICES				Complies with THE pilot area (Y/N)						
Section	Division	Group	Ecosystem Service Class	LP	PP2	PP3	PP4	PP5	PP6	PP7
		protection	Maintaining nursery populations and habitats (Including gene pool protection)	Y	Y	Y	Y	Y	Y	Y
		Pest and disease control	Pest control (including invasive species)	Y	Y	N	Y	Y	Y	Y
			Disease control	Y	N	N	Y	Y	Y	N
		Regulation of soil quality	Weathering processes and their effect on soil quality	Y	N	N	N	Y	Y	Y
			Decomposition and fixing processes and their effect on soil quality	Y	Y	Y	N	Y	Y	Y
		Water conditions	Regulation of the chemical condition of freshwaters by living processes	Y	N	N	N	N	Y	N
			Regulation of the chemical condition of salt waters by living processes	Y	N	Y	N	N	N	N
		Atmospheric composition and conditions	Regulation of chemical composition of atmosphere and oceans	Y	N	Y	Y	Y	Y	Y
			Regulation of temperature and humidity, including ventilation and transpiration	Y	Y	Y	Y	Y	Y	Y
	Cultural (biotic)	Direct, in-situ and outdoor interactions in the environment	Characteristics of living systems that that enable activities promoting health, recuperation or enjoyment through active or immersive interactions	Y	Y	Y	Y	Y	Y	Y
			Characteristics of living systems that enable activities promoting health, recuperation or enjoyment through passive or observational interactions	Y	Y	Y	Y	Y	Y	Y
		Intellectual and representative interactions with natural environment	Characteristics of living systems that enable scientific investigation or the creation of traditional ecological knowledge	Y	Y	Y	Y	Y	Y	Y
			Characteristics of living systems that enable education and training	Y	Y	Y	Y	Y	Y	Y
			Characteristics of living systems that are resonant in terms of culture or heritage	Y	Y	Y	Y	Y	Y	Y
			Characteristics of living systems that enable aesthetic experiences	Y	Y	Y	Y	Y	Y	Y
		Indirect, remote, indoor interactions with the environment	Elements of living systems that have symbolic meaning	N	N	Y	Y	Y	Y	Y
			Elements of living systems that have sacred or religious meaning	N	N	Y	N	N	N	Y
			Elements of living systems used for entertainment or representation	Y	N	Y	Y	Y	Y	Y
		Other biotic characteristics that have a non-use value	Characteristics or features of living systems that have an existence value	N	N	N	Y	Y	Y	Y
			Characteristics or features of living systems that have an option or bequest value	Y	Y	N	Y	Y	Y	Y
Provisioning (Abiotic)	Water	Surface water used for nutrition, materials or energy	Surface water for drinking	N	N	N	N	N	N	N
			Surface water used as a material (non-drinking purposes)	N	Y	Y	Y	Y	Y	N
			Freshwater surface water used as an energy source	N	N	N	N	N	N	N
			Coastal and marine water used as energy source	N	N	N	N	N	N	N
		Ground water for used for nutrition, materials or energy	Ground (and subsurface) water for drinking	N	N	N	N	Y	Y	Y
			Ground water (and subsurface) used as a material (non-drinking purposes)	N	N	N	N	Y	Y	Y
			Ground water (and subsurface) used as an energy source	N	N	N	N	N	N	N
				N	N	N	N	N	N	N
	Non-aqueous natural abiotic ecosystem outputs	Mineral substances used for nutrition, materials or energy	Mineral substances used for nutritional purposes	N	N	N	N	N	N	N
			Mineral substances used for material purposes	N	N	N	N	N	N	N
			Mineral substances used for as an energy source	N	N	N	N	N	N	N
				Y	N	Y	N	Y	Y	N
		Non-mineral substances or ecosystem properties used for nutrition, materials or energy	Non-mineral substances used for nutritional purposes	N	N	N	N	Y	N	N
			Non-mineral substances used for materials	N	N	N	N	Y	N	N
			Wind energy	N	N	N	N	N	N	Y
			Solar energy	Y	N	N	Y	Y	Y	Y
Regulation & Maintenance (Abiotic)	Transformation of biochemical or physical inputs to ecosystems	Mediation of waste, toxics and other nuisances by non-living processes	Dilution by freshwater and marine ecosystems	Y	N	Y	N	Y	Y	Y
			Dilution by atmosphere	Y	N	N	N	Y	Y	Y
			Mediation by other chemical or physical means (e.g. via Filtration, sequestration, storage or accumulation)	N	N	Y	N	Y	N	Y
				N	N	N	N	N	N	N
		Mediation of nuisances of anthropogenic origin		Y	N	N	N	Y	Y	Y
			Mediation of nuisances by abiotic structures or processes	Y	Y	Y	Y	Y	Y	Y

<u>ECOSYSTEM SERVICES</u>				Complies with THE pilot area (Y/N)						
Section	Division	Group	Ecosystem Service Class	LP	PP2	PP3	PP4	PP5	PP6	PP7
	Regulation of physical, chemical, biological conditions	Regulation of baseline flows and extreme events	Mass flows	Y	N	Y	N	N	N	Y
			Liquid flows	Y	N	Y	Y	N	Y	Y
			Gaseous flows	Y	Y	Y	N	N	Y	Y
		Maintenance of physical, chemical, abiotic conditions	Maintenance and regulation by inorganic natural chemical and physical processes	Y	N	Y	N	Y	Y	Y
Cultural (Abiotic)	Direct, in-situ and outdoor interactions in the environment	Physical and experiential interactions with abiotic components	Natural, abiotic characteristics of nature that enable active or passive physical and experiential interactions	N	N	Y	Y	Y	N	Y
		Intellectual interactions with abiotic components	Natural, abiotic characteristics of nature that enable intellectual interactions	N	N	Y	Y	Y	N	Y
	Indirect, remote interaction not requiring presence in the env.	Spiritual, symbolic and other interactions with the abiotic components	Natural, abiotic characteristics of nature that enable spiritual, symbolic and other interactions	N	N	Y	Y	Y	N	Y
		Other abiotic characteristics that have a non-use value	Natural, abiotic characteristics or features of nature that have either an existence, option or bequest value	Y	Y	Y	Y	Y	Y	Y

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Appendix 1



First step

Convert the habitat classification system in Corine Land Cover Classes (Green columns)
and then in Ecosystem class 2 (blue column)
following this hierarchical system

<https://biodiversity.europa.eu/maes/correspondence-between-corine-land-cover-classes-and-ecosystem-types>

For example refer to the application to the RNFI-Riserva Naturale Foce Isonzo

→ file: **T.1.1.4_habitat_ES_RNFI**

File naming: T.1.1.4_habitat_ES_ **acronym of the protected area**

Conversion of
Corine Land
Cover to
Ecosystem
class2

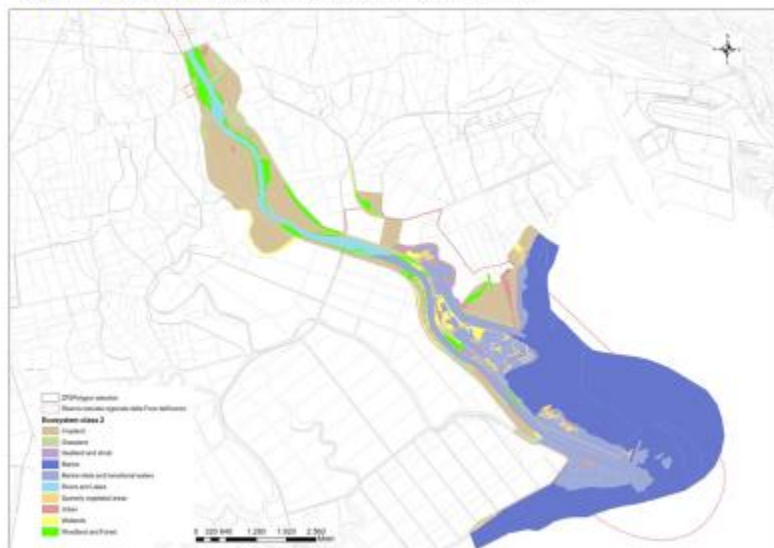
Conversion of
each protected
area habitat
classification to
Corine Land
Cover

Habitat class. of
each protected
area, for ex. Corine
Biotopes, Eunis
Emerald, Croatian
National Habitat
system etc.

CP	A	B	C	D	E	F	G	H	I
	Natura_2000_Code	Natura_2000_Name	Ecosystem class 2	Corine Land Cover Class 1	Corine Land Cover Class 2	Corine Land Cover Class 3	CORINE_3	Habitat Corine description	hectares
	(T110000)	see del'Fiume - Isola della Cor	Marine	3	3.2	3.3.1	10.02	Sublittoral soft seabeds	507.3
	(T110000)	see del'Fiume - Isola della Cor	Marine	3	3.2	3.3.1	10.03	Mediterranean Posidonia (Cymodocea) and Zostera beds	667.6
	(T110000)	see del'Fiume - Isola della Cor	Marine bays and transitional waters	3	3.2	3.3.2	10.2	Estuaries	285.1
	(T110000)	see del'Fiume - Isola della Cor	Marine bays and transitional waters	4	4.2	4.3.1	24	Mud flats and sand flats	47.1
	(T110000)	see del'Fiume - Isola della Cor	Marine bays and transitional waters	4	4.2	4.3.1	10.103	Mediterranean glasswort meadows	26.8
	(T110000)	see del'Fiume - Isola della Cor	Marine bays and transitional waters	4	4.2	4.3.1	10.25	High bedrock coralligenous meadows	10.3
	(T110000)	see del'Fiume - Isola della Cor	Marine bays and transitional waters	4	4.2	4.3.1	10.56	Mediterranean salt marsh submediterranean	88.6
	(T110000)	see del'Fiume - Isola della Cor	Marine bays and transitional waters	4	4.2	4.3.1	10.56	Mediterranean salt marsh grass meadows	3.5

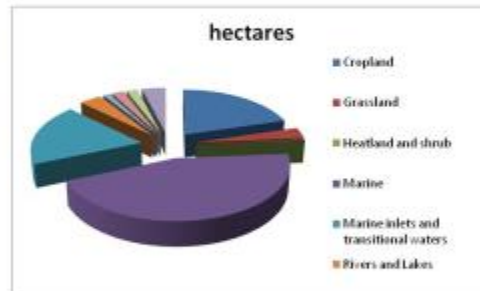
Second step

Generate an ecosystem map of the protected area (if the habitat map is available) by joining the
T.1.1.4_habitat_ES_RNFI with the attribute table of the habitat map



Third Step Statistics

Ecosystem class 2	hectares
Cropland	342,0081
Grassland	87,92454
Heathland and shrub	3,6
Marine	1194,943
Marine inlets and transitional waters	499,357
Rivers and Lakes	99,34854
Sparsely vegetated areas	29,75625
Urban	53,94177
Wetlands	30,66899
Woodland and Forest	106,0622



Defining related
Ecosystem Services (ESS)

Fourth step

Refer to:

- [T1.1.4 ESS_matrix_terrestrial](#) for the following ES types level 2:

- Grassland
- Heathland and shrub
- Woodland and forest
- Wetlands

- [T1.1.4 ESS_matrix_marine](#) for the following ES types level 2:

- Marine inlets and transitional waters
- Marine

Produce the excel file per each ES and rename the excel file with the name of the ES

Then, in column "K" indicate if the ESS complies with your pilot area, indicating Y (yes) or N (not)

Delete from the excel file the ESS which are not consistent with your case/pilot

Reproduce the exercise per each ES

For example refer to the application to the RNFI-Riserva Naturale Foce Isonzo

→ file: [T1.1.4 ESS_matrix_marine_RNFI](#)

File naming: T1.1.4_ESS_matrix_name of the ES_acronym of the protected area

Ecosystem Services										ESS IN Y/N
Section of ESS	Division of ESS	Group of ESS	Ecosystem Service Data	Class type	Simple description	Ecological function	Use class	Example Service	Example Benefit and Benefit	Complies with your pilot area (Y/N)
Provisioning	Terrestrial	Cultivated aquatic plants for nutrition, material or energy	Plants cultivated for nutrition, material or energy	Plants, algae by amount, type	Plants that are cultivated in fresh or salt water that we can eat as a material	The ecological contribution to the growth of cultivated algae under production	that can be harvested and used as raw material for the production of food	Harvested service of cultivated biomass	Harvested service of cultivated biomass	Y
		Algae and other material from in situ aquaculture for direct use or processing (including genetic material)	Plants, algae by amount, type	Plants, algae by amount, type	Plants that are cultivated in fresh or salt water that we can eat as a material	The ecological contribution to the growth of cultivated algae under production	that can be harvested and used as raw material for the production of food	Harvested service of cultivated biomass	Harvested service of cultivated biomass	N
		Plants cultivated for in situ aquaculture green as an energy source	Plants, algae by amount, type	Plants, algae by amount, type	Plants that are cultivated in fresh or salt water that we can eat as a material	The ecological contribution to the growth of cultivated algae under production	that can be harvested and used as raw material for the production of food	Harvested service of cultivated biomass	Harvested service of cultivated biomass	N

Well done

