

# BLUEMED

## Activity 3.2

State-of-the-art analysis and benchmarking in  
MED Underwater Museums and Diving Parks

### Deliverable 3.2.1

State-of-the-art analysis of Underwater  
Museums and Diving Parks

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## FOREWORD

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The French archaeologist Salomon Reinach (1858 – 1932) said: "the sea is the most immense museum in the world."

Over the course of the centuries, the Mediterranean Sea has represented a crossroads of civilisations, from the prehistorical and classical period, until the medieval and modern age. Through their commercial relationships, along sea routes cruised for millennia, each one left traces and important testimonies along the coastline and on the seabed.

The numerous wrecks of ships, airplanes and submarines sunk during the World War II have unfortunately enriched this enormous underwater heritage, previously left behind by storms, shallow seabeds and rocks emerging from the water.

**Underwater Cultural Heritage (UCH)** has been principally declared **in situ preserved** (articles 1-8) by the UNESCO Convention on the Protection of the Underwater Cultural Heritage (2001). This deliverable reports the state-of-the-art analysis of **Underwater Museums and Diving Parks**, as defined by the mentioned Unesco Convention.

In most of the involved Countries, however, these definitions are non (yet) clear / non officially mentioned in the national laws, so the **analysed UCH sites are those sites recognised as in situ submerged settlements and shipwrecks**, without any mention to the countless EU Marine Archaeology Museums displaying archaeological collections and artifacts recovered from the seabed.

The report includes also the '**Underwater Trails**', **identified as underwater diving routes including both natural and cultural heritage** but (still) not officially classified, either as Underwater Museums / Diving Parks or as Marine Protected Areas.

In addition, the report analyzes similar UCH sites across the EU: the selected Pilot Sites and other similar sites have been investigated with regard to their location, extent, history and main characteristics, in order to study their specific safeguarding protocols and diving policies according to the national laws ruling their governance.

The contents of this deliverable are related to the Project's General Target 1: 'Protect the marine ecosystem of the Mediterranean by aligning planning and implementation of the Integrated Coastal Zone Management protocol, Marine Spatial Planning directive and Green Infrastructure'.

This target aims to achieve the Individual Objective 1: ‘Study, adapt, harmonise regional, national strategies, plans and actions of selected locations in the Mediterranean with the aim to plan, test, coordinate and network the studied Underwater Museums and Diving Parks.’

The contents of this report are expected to assess the ‘state-of-the-art analysis of Underwater Museums and Diving Parks’, mainly focused on the 5 pilot sites and extended to cover similar sites across EU.

The subsequent Deliverable 3.2.2 will provide a benchmarking study in order to identify operational/ business models for UMs and DPs, based on the current management models and tools in the UCH sites.

In this report, an overall assessment of the Underwater Heritage Sites, spread all over European coastlines, has been conducted, in order to give information related to:

- 1 – The extent and number of the main underwater heritage sites and artifacts;
- 2 – The number of UMs and DPs established and their characteristics;
- 3 – The different kind of submerged sites and artifacts available along the EU-Mediterranean coastlines;
- 4 – The national/regional laws and policies set up to protect and enhance UCH sites, UMs and DPs, and their differences in the general context of the EU directives.

The information about the good management, promotion and preservation practices would have been also a target of this deliverable, but a correct, thus general analysis of the operational models, often changing brusquely from one UCH site, UM or DP to the other, or on a regional basis, proved not to be easily investigated.

This topic has been generally approached in the introductory chapters of each studied Country, providing the main aspects of each national conservation policy and management strategy, without giving a rate of their real effectiveness or success in achieving the identified objectives.

This further step would have needed the prior definition of shared qualitative and quantitative parameters, the identification of a ‘best practice’ model widely applicable, and the availability of the related results at least in the short-medium term.

For instance, the assessment of the current conservation status of a UM or DP, compared to another one in a different country, would mean: current conservation

conditions not always easy to assess, linked to qualitative data (when available) and subject to a wide variety of factors (kind of UCH site, environmental factors, number of visitors, accessibility by unauthorized visitors, etc.).

The identification of 'best practice' models will be conducted through the Deliverable 3.2.2, 'Benchmarking study of successful Underwater Museums and Diving Parks', that would give the parameters through which the success of an operational model could be measured and compared.

In order to achieve the Individual Objective 1: 'Study, adapt, harmonise regional and national strategies, plans and actions' on a wider scale with respect of the selected pilot sites, the information about the amount, location and kind of UCH sites will prove to be crucial for the Project follow-up phase.

Looking at a future Mediterranean-EU UCH sites network, the assessment of all the submerged heritage through an EU shared database, established collecting the existing national databases and supported with a periodic monitoring and data collection activity, would provide an excellent management tool in order to:

- 1 - List the UCH sites worth to be developed as Ums and DPs;
- 2 - Apply and evaluate EU conservation policies and management strategies;
- 3 - Link together related UCH sites through dedicated routes and itineraries.

The present report gives an overview of the main EU-MED UCH sites, UMs and DPs in the above mentioned context.

## EUROPEAN UCH SITES, UNDERWATER MUSEUMS AND DIVING PARKS

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**“UNESCO MANUAL FOR ACTIVITIES DIRECTED AT UNDERWATER CULTURAL HERITAGE (UCH)” reads at Rule 1: “The protection of underwater cultural heritage through in situ preservation, shall be considered as the first option”.**

The reasons for recommending conservation in situ of submerged historical and archaeological items lie in various requirements of an ethical and cultural nature (cfr. UNESCO - Convention on the Protection of the Underwater Cultural Heritage – Paris, 2 november 2001). Primarily, there is the recognition of the need to respect the historical context which the submerged item belongs to, just as on dry land.

**Overall, it is mandatory to leave ancient remains in the place where they have been discovered, unless there are strong factors urging recovery,** because removing the remains from their resting place would irreversibly alter the cultural and scientific integrity of the site.

**Often, the underwater site represents the best resting place for conserving a submerged object:** after hundreds, or thousands of years hidden in a particular environment, often with low or zero presence of dissolved oxygen, protected by accumulated sediments and encrusted patinas, the object reaches an equilibrium with its surroundings.

When this equilibrium is brusquely interrupted, the process of deterioration begins. The only objects that urge recovery from the seabed, apart from their conservation needs, are those for which it is not possible to ensure protection against illegal acts, and those that can give a significant contribution to the cultural heritage and for which recovery seems to be the best option for conservation.

For all these reasons, a careful documentation of the site where the object is located and an appropriate conservation and restoration project must be put in place before starting the recovery operations, to be carried out in suitable surroundings by personnel with specific professional skills (conservators - restorers).

**The creation of Natural Marine Parks, Reserves and Protected Marine Areas including underwater sites of archaeological or historical interest, and the creation of Underwater Archaeological Parks and Trails is proving to be an effective instrument for the *in situ* safeguarding of the UCH.**

The main objectives of these institutions are the conservation and enhancement of the heritage both natural and cultural, its protection from thefts and vandalism and from the destructive forces of the marine elements, and finally the enjoyment of the natural and archaeological heritage itself.

The *in situ* conservation and exhibit of underwater artefacts should not be considered as just an opportune choice under the point of view of the heritage preservation. It should provide a strong incentive for experimenting new conservation materials and technologies, as well as new pathways in the socio-economic development of the local communities.

In the Mediterranean Sea, there are hundreds of underwater sites of archaeological interest, due to the usage of the sea trade routes between southern Europe, Middle East, and North Africa since the very beginning of our civilisation (Figures 1-4).

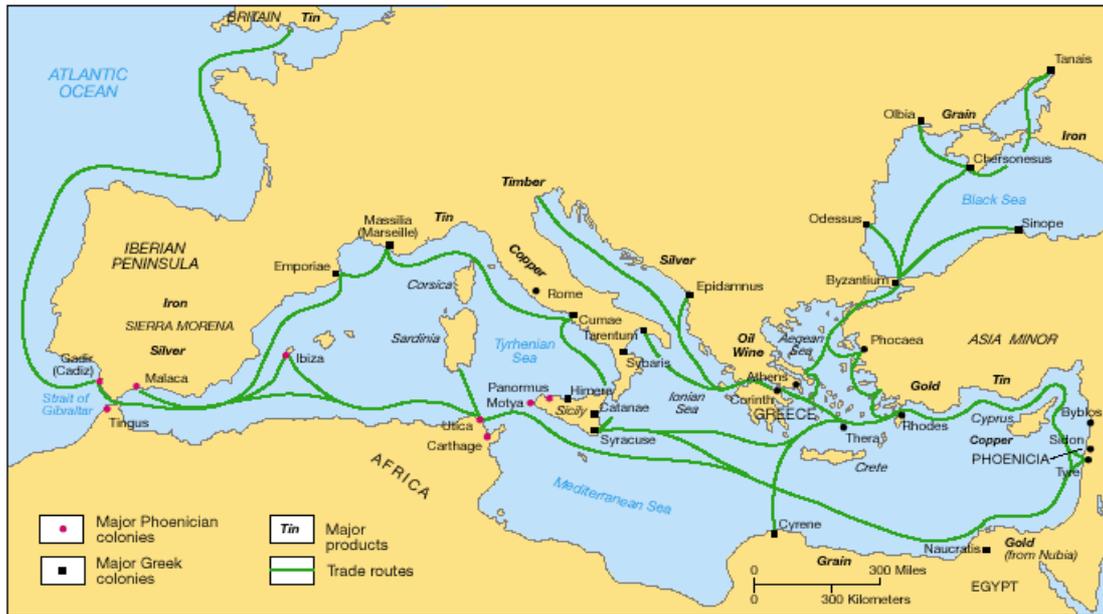
In an effort to protect them, important International Laws and EU Directives have been adopted by each EU member Country through National Laws, aiming at the protection of natural marine and coastal environment and to safeguard the cultural heritage.

In this frame, each EU Country established **Underwater Archaeological Parks** and **Marine Protected Areas**, characterised by specific objectives and policies towards the safeguarding and enhancement of the Underwater Cultural Heritage (UCH) sites.

Another management tool used towards the protection of the underwater natural and cultural heritage are the **Archaeological Underwater Trails**, devoted to scuba diving visits, thus granting the monitoring and enhancement of the UCH sites.

Apart from these institutions, a fundamental tool for the management of the protection and dissemination of the UCH sites is their **Inventory**, according to the Article n. 22 of the UNESCO 2001 Convention.

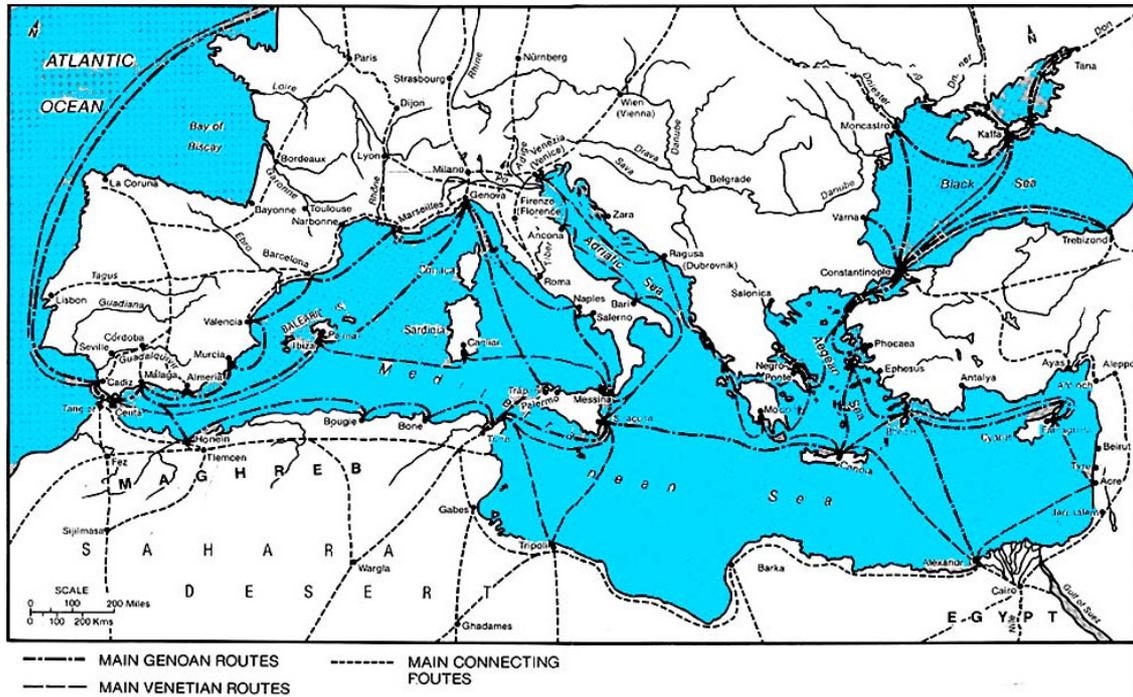
The cited article encourages every Country that ratifies the Convention to prepare and update a national register of the existing **Protected Sites and Artifacts**, acting for their conservation and setting up preservation policies.



**Figure 1:** Greek and Phoenician colonies and trade; Phoenician and Greeks first colonized the western Mediterranean and together controlled trade throughout the region.



**Figure 2:** Roman Empire at its height, ca. AD 200. Sea trade routes cross all the Mediterranean and the coasts of Atlantic Ocean to Portugal and Britain.



**Figure 3:** Main Mediterranean and Black Sea routes in Medieval times.



**Figure 4:** Main North Sea and Baltic Sea routes in Medieval times (Hanseatic League)

Typical of sites and monuments belonging to the Underwater Cultural Heritage of the Mediterranean, are submerged settlements and shipwrecks, ranging from ancient commercial ships to warships of the twentieth century.

Since the 2000s, there have been several attempts to legislate at the national and EU level, in order to establish Underwater Cultural and Natural Heritage Sites as Underwater Museums and Diving Parks and to allow on-site access to the public under the guidance of certified professional divers.

However, in the Mediterranean, the majority of underwater natural and cultural heritage sites remains without a proper or effective legislative framework.

Where such framework exists, it often forbids the possibility of on-site access, eluding every kind of sustainable and responsible tourism development of coastal and marine areas with important underwater natural and cultural heritage.

The national and local institutions and stakeholders sometimes find themselves on opposite sides of the problem: the first ones unable to protect effectively the underwater heritage through sustainable safeguarding and monitoring protocols, the others unable to find a suitable way to attract natural, cultural and diving tourism.

The diversity of UCH sites, the width of the involved marine areas, the lack of a shared management policy both at a local and a national level, the communication gap between public authorities and private companies, are some of the factors that mostly affect the sustainable development of Underwater Museums and Diving Parks and in general the protection and enhancement of UCH sites.

What follows is an analysis of Underwater Museums, Diving Parks and Underwater Trails, as previously identified, both in the Mediterranean Countries and in the North Sea/Baltic Sea Countries, aimed to identify the main UCH Sites in the EU.

The already existing EU directives, ratified by every EU Country, are listed below; the national legislation framework of each Country is described right after the description of Country's UCH Sites.

The comparison between national laws and EU directives, together with the identification of the effective needs of the UCH sites and the existing gaps in their sustainable management will prove essential to establish a cultural and legislative enhancement in their protection and touristic development.

## ITALY

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### **Analysis of Underwater Museums, Diving Parks and Underwater Trails**

‘Italy, with over 700km of coastline and a central position in the Mediterranean basin, conserves within its waters a vast underwater archaeological heritage, testimony of the fundamental role it has played at the crossroads of travel over the course of centuries which has connected the East and the West and the three continents which boarder the sea’ ([www.archeomar.it](http://www.archeomar.it)).

However, in the Italian National Laws there is no traceable definition about ‘Underwater Museum’ and/or ‘Diving Park’: that is why in Italy no UMs and DPs have been institutionally created, even if many UCH sites and diving trails, inside or outside the existing National Parks and Marine Protected Areas (MPAs), could be recognized as such.

Below, some definitions related to the ‘Underwater Museum’ concept, according to minor Laws:

Through the **Newsletter n. 12059 sent in 15 November 1990**, the Ministry of Cultural Heritage and Landscape clarified the **definition of ‘Archaeological Park’**: a protected natural area that hosts monumental evidences and that can thus be recognized as **‘Outdoor Museum’**.

This definition fits perfectly with the archaeological areas on the land (Pompeii, Paestum, Temple Valley in Agrigento, Palatinum in Rome, etc.), and possibly for UCH sites also, however the UMs or DPs and trails are never mentioned.

**The former Italian Unified Code on the Protection of Cultural Heritage and Landscape (Law n. 490, 29 October 1999)**, now overcome by the 42/2004 Unified Code, gave an even **better definition of ‘Archaeological Park’** (article n. 94).

This concept has been identified as **‘the territorial context distinguished by significant archaeological evidences, living together with historical, landscape and naturalistic values, organized as outdoor museum through thematic itineraries and didactic media’**.

This is so far, the best definition in the Italian legislation, fitting perfectly both on the ground and under the sea, even if not clearly referred to UCH sites, and even if overcome by the new 42/2004 law, much more generic and never specifically referring to the UCH sites.

This definition for the first time **links together the context** (naturalistic, historical, landscape), **the evidences** (archaeological sites, buildings or artifacts) and the **need of heritage divulgation and cultural dissemination**, this last one typical of the traditional indoor museums.

The 'cultural activities', recognized as important as the cultural 'goods', in those years led to the transformation of the overall Italian cultural sector, starting from the Ministry, whose name was changed in 1998 as 'Ministry of Cultural Heritage and **Activities**'.

Later on, in 2013, the **close relationship between correct safeguarding activities and responsible touristic management of the cultural heritage** resulted in a new definition of the main Italian safeguarding institution: 'Ministry of the Cultural Heritage and Activities and of the **Tourism**'.

Many Italian UCH sites and diving trails, especially those included in the MPAs, display both characteristics: correct safeguarding policies related to the naturalistic and archaeological heritage and responsible touristic management (typical of DPs), thus only a few are equipped with proper didactic media (peculiar for the definition of UM).

**The UCH goods and sites in Italy have been listed through the Archeomar Project** (according to the Law n. 264, 8 November 2002, article 13, <http://www.archeomar.it/archeomar/>), financing and promoting the register of all archaeological submerged evidences along the coastlines of Campania, Basilicata, Calabria e Puglia (Archeomar 1) and then of Lazio and Tuscany (Archeomar 2). The Archeomar Project activities started in 2004 and ended in 2011.

The result is an **archaeological map of the Italian seas**, hosted on a GIS platform and 'created with the awareness that the cataloguing and the knowledge of what is still preserved on the seabed represent the only instrument for the correct management and safeguard of the submerged heritage'

(<http://ancientworldonline.blogspot.it/2017/05/the-archeomar-project-archaeological.html>)

The submerged heritage has been classified as follows:

- single artifacts
- shipwrecks / cargoes from the Classical, Medieval and Renaissance Age
- shipwrecks from the Modern Age
- archaeological Built Heritage

The UCH artifacts, wrecks and sites are located either inside Marine Protected Areas (MPAs), Marine National Parks and Underwater Parks (where their safeguarding and touristic fruition is managed by Public Authorities according to specific laws and policies), or outside the protected areas, where only Diving Trails are set up, on a private base.

In Italy, as of today there are **27 Marine Protected Areas** covering an overall area of 222.000 hectares (<http://www.parks.it/indice/RM/index.php>), **2 Geo-Marine National Parks** (Arcipelago della Maddalena and Arcipelago Toscano), and **2 Naturalistic National Protected Areas-Underwater Parks** (Baia Sommersa and Gaiola).

Moreover, the **International Sanctuary for Marine Mammals in the Mediterranean Sea** (shared by Italy, France and Monaco) covers another 2.5 million hectares.

The **National Parks** (NPs) have the aim of enhancing and conserving the rich natural coastal and marine heritage of the country.

The **Marine Protected Areas** (MPAs) can be considered as the instrument to promote and support forms of economic and social development while being consistent with the objectives of environmental sustainability.

The NPs and MPAs have been created according to:

- a) the quality of their water;
- b) the geomorphological, physical and biochemical characteristics, with particular emphasis on coastal and marine flora and fauna;
- c) the scientific, ecological, cultural, educational and economic importance.

NPs are divided into specific areas, each one bearing specific limitations to human activities (partial protection or integral protection).

MPAs are usually divided into three sectors with differing degrees of protection:

- Zone A: untouched natural reserve (no entry - no take), where scientific research is the only human activity allowed in order to ensure the repopulation of flora and fauna and the safeguarding of biodiversity.
- Zone B: general reserve (no take), where bathing, guided visits and dives and ship cruises are activities allowed under strict policies.
- Zone C: partial reserve - buffer zone, where all human activities with low environmental impact are allowed.

In many cases, these protected areas contain sub-areas or individual artefacts of archaeological interest. Thus, the same law that establishes them, defines their degree of protection and their management policies.

Below are listed and shortly described the two Italian Geo-Marine National Parks, the two Underwater Parks, the MPAs hosting UCH sites, and the main Italian Diving Trails to the most famous archaeological underwater sites and artifacts.



*Figure 5: Map of Italy showing the most relevant, to this deliverable, Cities and Seas*



**Figure 6:** Map of Italy showing the 27 MPAs (in red) and the Submarine Parks (in green)

## Geomarine National Parks

### Geomarine National Park - Arcipelago della Maddalena (Oristano, Sardinia)

*National Park, Code: EUAP0018*

*Managing Authority: Maddalena National Park*

*Creation Laws: Law n. 10, 4<sup>th</sup> April 1994 – Presidential Law 17<sup>th</sup> May 1996*

*Land surface: 5.100,00 hectares*

*Sea surface: 15.046,00 hectares*

<http://www.lamaddalenapark.it/>

It is a geomarine protected area consisting of a group of islands situated in the north-east of the coast of Gallura, in the stretch of sea between Sardinia and Corsica known as Bocche di Bonifacio. Its 180 kilometres of coastline cover 1/10 of the whole Sardinia coastline. The National Park includes all the marine area and over 60 islands belonging to the archipelago. Except for the Maddalena Island and the Stagnali village in Caprera, the islands are completely uninhabited and their aspect never changed during the last two centuries.

On the seabeds, particularly appreciated by divers from all over the world, the rich flora and fauna species live together with the remains of several shipwrecks both from classical and modern age. A treacherous coastline that, together with the often-fatal Bonifacio Straits, hosted one of the most used sea routes of the Mediterranean Sea. Below, a short description of some of the most relevant wrecks:

- Spargi Island - Roman ship from the I-II sec. BC:  
A significant example of the trades held in the past in this area by ancient mariners and merchants, it beared a load of amphorae (type Dressel 20 e 70/11) and pottery from Campania and Aegean Coasts. Some remains of the ship's wooden structure are still lying at a depth of 18 meters.
- Spargi Island – 'Clan Ogilvie SS':  
A modern age passenger/cargo ship almost 100 meters long. Wrecked west of Spargiotto on the 8th January 1888, when on route from Bombay for Marseille, it lies at a depth of 52 meters.
- Punta Marmorata – 'Agelika Wreck':  
Greek cargo ship of 50.000 tons, sunk in the '80s after a storm close to the 'Marmorata' island, while crossing the Bonifacio Straits. Broken into three sectors, the shipyard emerges from the water, while the deepest part of the wreck is the helix, at -21 meters.

The central and stern sectors of the ship are in a good state of conservation: it is still possible to visit the cockpit and the crew quarters.

### **Geomarine National Park - Arcipelago Toscano (Livorno, Tuscany)**

*National Park, Code: EUAP0010*

*Managing Authority: Arcipelago Toscano National Park*

*Creation Laws: Law n. 305, 28<sup>th</sup> August 1989; Ministry Decrees 21<sup>st</sup> July 1989 and 29<sup>th</sup> August 1990; Presidential Law 22<sup>nd</sup> July 1996*

*Land surface: 16.856,00 ha*

*Sea surface: 56.766,00 ha*

<http://www.islepark.it/>

Located in the municipalities of Grosseto and Livorno, it is the biggest Marine Park in Europe. The area includes islands holding an amazing naturalistic and historical heritage, among others: Giannutri, Capraia, Elba, Montecristo and Giglio.

#### **Capraia Island**

The skeleton of a German seaplane Arado Ar 196, from World War II, lies in the sandy seabeds of Capraia Island, at a depth of 45 meters, and 350 metres off the Capraia harbour, in the so called 'Airplane Shallow'. The wreck is in bad conditions (only the metallic framework of the fuselage and the engine, without the helix, are still in place). Completely wrapped up with fishing nets, it has been discovered some fifteen years ago, presumably carried accidentally near the coastline by a fishing boat.

#### **Giannutri Island**

Nasim (Nasim II): cargo ship built in 1959, sunk in a February night in 1976 right in front of Giannutri Island, close to Cala Maestra, wrecked on rock. In the hold, there were dozens of cars: some still inside the wrecked ship, some spread on the sandy seabed at 35-60 meters of depth.

'Anna Bianca' wreck: Greek cargo ship sunk at the end of 1970s for unknown reasons. 100 meters off the coastline, inside Cala Ischiaiola, it lies on the sandy seabed at a depth of 40 meters, broken in two sectors.

#### **Elba Island:**

'Bettolina' wreck: It is the wreck of a cargo ship 50 meters long and 7 wide, carrying material to Elba Island and sank for unknown reasons. It appears in navigation trim on a sandy bottom at 60 meters deep back up to 50 on the quarterdeck. Visible the winch and it's still possible to penetrate several meters into the hold or in the cabin.

'Junkers 52' Airplane wreck: About 300 meters north from the lighthouse of Portoferraio and 37 meters deep is the wreck of a Junkers 52 of the German Airforce.

It was shot down on 9<sup>th</sup> September 1944 and discovered only in 1997 by a diving center with the help of some local fishermen.

Dolia Shipwreck: The Roman Shipwreck of Punta del Nasuto, a Roman merchant ship (50 BC – AD 50) sunk nearly 300 meters off shore and 65 meters deep, with a cargo of dolia (storage containers), explored and mapped in 2008.

'Minesweeper FR70': Built in 1913, the ocean fishing ship 'La Coubre', steam propelled, was 38 meters long and had a tonnage of 253 tons. In 1939 the French Navy converted it into a minesweeper boat, and in January 1943 it was given to the Italian Navy for the mine-clearing operations after the departure of the Germans.

A few months later, in 25<sup>th</sup> July 1943, it sunk after having been hit by cannon balls launched by the British 'Safari' submarine. The wreck lies at 4.3 miles west from the Elba coastline, near Pomonte, at a depth of 75 meters on the sandy seabed.

'Santa Rita' wreck: An Italian cargo ship built in Palermo in 1913, 116 meters long and 5.160 tons; in 1918, hit by a torpedo launched by the U-Boot UB-68, goes under repair in the shipyard of Genova.

The 28<sup>th</sup> February 1943, a British airplane bombs the Cagliari harbor, where the Santa Rita was, damaging again the ship, which goes under repair a second time.

A few weeks later, however, the 13<sup>th</sup> May, after another bombing raid by the RAF airplanes over Cagliari, the ship sunk. In 1945, after the war, the ship is recovered from the harbor seabed and, damaged but floating again, towed by two tug boats, heads to the Livorno shipyard to go under repair a third time. Its trip eventually ends close to Pianosa Island, exploding on a German mine slipped during the post war mine-clearing operation. The Santa Rita wreck lies now in navigation trim, almost 85 metres deep: almost intact, except the prow, destroyed by the mine.

Pomonte wreck: In the south-west of the island, close to Ogliastra's rock, in front of the small beach of Pomonte, on 10<sup>th</sup> January 1972 the Elviscot, an Italian cargo of 499 tons, left from Naples to Marseilles, ending up shipwrecked on the rocks, fortunately without consequences for the crew. The entire stern, the bridge and part of the forward side, lie on the sandy seabed, just 12 meters deep. The ship bridge is easy to explore, through the huge upper opening. Entering inside there's the engine room where it is still preserved the entire engine system.

Britten Norman BN 2 Islander: It's a twin-motor 8-seater airplane, considered as one of the underwater attractions of the Island. It lies at -24 meters, close to the Iscali Rock. Even without the back end, the airplane is in good conditions. Relocated several times by the diving instructors, it seems to have fallen down in Barbarossa area.

<http://www.parks.it/parco.nazionale.arcip.toscano/index.php>

## **National Naturalistic Protected Areas – Underwater Parks**

### **National Naturalistic Protected Area - Underwater Park - Baiae (Naples, Campania) BLUEMED PILOT SITE**

*Other Naturalistic National Protected Areas, Code: EUAP0849*

*Creation Law: Inter-Ministry Decree August 7<sup>th</sup> 2002.*

*Managing Authority: Soprintendenza Archeologica Pompei (MiBACT)*

*Sea surface: 177 hectares*

<http://www.minambiente.it/pagina/parco-sommerso-di-baia>

The involved public institutions are: the Italian Ministry for the Environment and Land Conservation, acting together with the Ministry of Cultural Heritage and Activities and of the Tourism - MiBACT), the Ministry of Transport, the Ministry of Agriculture and Forests and with the Regione Campania.

The involvement of four Ministries and the Regional Administration testifies to the importance of legislation introduced to safeguard this highly significant underwater archaeological site.

The area is located off the north-western coasts of the bay of *Puteoli* (Naples), in the littoral zone between the southern limit of the port of Baiae and the dock of *Lido Augusto*. This site is part of the coastal region known as *Campi Flegrei*, that has been characterized in ancient times by a periodic volcanic and hydrothermal activity and it has been subjected to bradyseism, namely gradual changes in the levels of the coast with respect to the sea level.

Ancient Baiae was a bathing resort for the Roman aristocracy between the 1<sup>st</sup> century BC and the 4<sup>th</sup> AD. As a result of bradyseism, it began to sink into the water around the 3<sup>rd</sup> century AD. The ancient city that is now almost completely submerged was famous for its luxurious seaside villas, public offices, baths, shops and coastal installations.

The NPA-UP of Baiae, which has an area of about 176.6 hectares, not only safeguards the archaeological remains of the Roman city and infrastructures of the roman harbor named *Portus Iulius*, but also represents an underwater area of great environmental value. Environmental aspects of this area are related to a peculiar volcanic and geo deformational history. As it is known, since antiquity this coastal region has been

subject to the phenomenon of bradyseism, which may be positive or negative, and in its present state, the remains of the Roman Era are submerged at a depth ranging between 1 and 14-15m below the current sea level.

Over the last years, the Soprintendenza Archeologica di Napoli was the Managing Authority of the MPA-UP, however recently this role moved to the Parco Archeologico dei Campi Flegrei as the new Managing Authority. Today the MPA-UP of Baiae has at least five itineraries open to the public, for both divers and non-divers. Non-diver tourists can visit the site on board a boat with a transparent bottom. The local diving clubs are authorized by the Managing Authority to accompany underwater tourist visitors to the submerged city.

The underwater itineraries are: 1) the Villa of the Pisoni, 2) the “Villa with protyr entrance” – “Villa with vestibule”, 3) the “Nymphaeum of Punta dell’Epitaffio” 4) “Portus Iulius”; and 5) the “Secca fumosa”.

<http://www.minambiente.it/pagina/parco-sommerso-di-baia>

<http://www.naturaitalia.it/apriAreaNaturale.do?idAreaNaturale=52&numeroPuntoInformativo=1&maptype=deag>

### **National Naturalistic Protected Area - Underwater Park - Gaiola (Naples, Campania)**

*Other Naturalistic National Protected Areas, code: EUAP0850*

*Managing Authority: Soprintendenza Speciale per i Beni Archeologici di Napoli (MiBACT)*

*Creation Law: Inter-Ministry Decree 07<sup>th</sup> August 2002*

*Sea surface: 42,00 hectares*

<https://www.areamarinaprotettagaiola.it/>

The Naturalistic Protected Area of Gaiola Underwater Park is located in the gulf of Naples, right in front of the Posillipo quarter. The whole area is full of remains of Roman villas emerged both on land and underwater. The vestiges of the old buildings are scattered on the park’s seabed. These are the submerged parts of one of the many ancient buildings which used to be there, like the Imperial Villa of Pausilypon, which belonged to Vedio Pollione, a freedman and friend of Emperor Augustus.

In addition, on the seabed a visitor can see the remains of a small harbor and a nymphaeum, together with some old fish pools, used for the breeding of moray eels. On the eastern side of the Park, there are the remains of another Roman structure, the so called “Casa degli Spiriti” – The Haunted House. The area is available for both diving and snorkeling tours and there is a glass-bottom boat service too.

Data on the the Gaiola Underwater Park were obtained from the following websites:

<http://www.minambiente.it/pagina/parco-sommerso-di-gaiola>

[http://www.areamarinaprotettagaiola.it/the\\_gaiola\\_underwater\\_park.htm](http://www.areamarinaprotettagaiola.it/the_gaiola_underwater_park.htm)

## Marine Protected Areas

(Listed only the 16 MPAs including UCH sites)

### Marine Protected Area – Capo Rizzuto (Crotone, Calabria) - BLUEMED PILOT SITE

MPA Code: EUAP0166

Managing Authority: Province of Crotone

Creation Law: Inter-Ministry Decree 27<sup>th</sup> December 1991 – Ministry Decree 19<sup>th</sup> February 2002

Sea surface: 14.721 hectares

<http://www.ampcaporizzuto.it>

The Marine Reserve of *Capo Rizzuto* is located in the central-eastern area of Ionic Calabria, and covers the sea stretch in front of the municipalities of Crotone and Isola Capo Rizzuto, along 42 Km of coastline. Its creation serves a double aim: the safeguarding of its rich naturalistic heritage and the protection of its amazing underwater archaeological sites. It hosts some underwater trails like “Le Castella” (in front of the Aragonese Castle), with a maximum depth of 5 m, in which divers and snorkelers can admire several marble blocks from the ancient quarry. Subsequently, there is the “Punta Scifo Bay” where divers and snorkelers can admire, through two different trails, the cargo of a *Lapidaria* from the III century AD, an ancient commercial ship carrying Asian marbles. (<http://www.ampcaporizzuto.it/index.php?id=71>)

The shipwreck, called *Punta Scifo D*, shows 54 large blocks and slabs of Proconnesian and Docimean marble. A preliminary study of the pottery sets an estimated dating around the 3rd century AD. This ancient ship was about 40 m long and 14 m wide. The preliminary study describes a cargo of almost 340 tons, one of largest found in the Mediterranean. Around “Capo Colonna”, “Capo Pellegrino” and “Capo Cimiti” there are three different cargoes with marble columns and lithic grinders. There is also another underwater trail, at a depth of -24 to -29 metres, where a visitor can see the “modern” shipwreck *Gunny*, sank in 1963, lying on the seabed. Additionally, there is the Bengala shipwreck (“Chico”), sank in 1889. Apart from the wrecks’ structure and cargo, a diver can also admire the rich biodiversity of marine organisms found there, which successfully colonized both *Chico* and *Gunny*.

<http://www.ampcaporizzuto.it/index.php?id=72>

<http://www.visas-project.eu/it/case-stady-it.html>

<http://nelblu.us/italia/isola-capo-rizzuto/relitto-del-bengala-o-chico/>

<http://www.scuba-academy.it/archeologia-marina-il-relitto-nellarea-marina-di-capo-rizzuto/>

### **Marine Protected Area - Capo Carbonara (Villasimius, Sardinia)**

*MPA Code: EUAP0953*

*Managing Authority: Municipality of Villasimius*

*Creation Law: Ministry Decree 3<sup>rd</sup> August 1999*

*Sea surface: 14.360 hectares*

<http://www.ampcapocarbonara.it/>

The Marine Protected Area of Capo Carbonara covers an area of 8.598,00 hectares. Capo Carbonara and the two islands of Cavoli and Serpentara, represent a magnificent and unique natural park in the south-east Sardinia. The variety and original form of granitic rocks give particular nuances to the landscape. The small village of Carbonara, which in 1862 was named *Villasimius*, takes its former name from the intensive exploitation of charcoal (in Italian 'carbone') practiced a long time ago.

The submerged areas of Villasimius enclose archaeological finds of various periods:

Cala Sinzias - 'Relitto delle Antefisse': a Roman cargo ship (*navis oneraria*) bearing building materials (among others, many *tegulae* and *antefisse*), sunk in the I century AD at a depth of 30 meters.

Secca del Berni - Roman cargo ship: dated back to 250 AD carrying potteries from Lazio and greek and italic amphorae.

Capo Carbonara - 'Relitto delle Saliere': a medieval ship carrying glass artifacts and crockery.

Capo Carbonara - Bengasi (Wreck of the Glasses): a Tirrenia ferry-boat sunk in 1941 after the attack by the British submarine *Truant*. It lies in perfect navigation trim at a depth of 88 - 96 meters, Very famous its load with glasses, bottles, glass vases and more. On the stern, there is still a beautiful cannon.

Secca di Punta Molentis (Isola dei Cavoli) - Spanish sailing vessel from the XV century: heading to Sicily, it was loaded with a wide variety of weapons (lances, swords, cannons), decorated dishes and *azulejos* tiles.

Secca di Santa Caterina - cargo ship Egle: over 70 metres long, used during the World War II as supplies cargo. It sunk in 29 March 1943, hit by three torpedos launched by the Dutch submarine Dolfijn, while heading to Maddalena Island.

<http://www.parks.it/riserva.marina.capo.carbonara/iti.php>

### **Marine Protected Area – Capo Gallo-Isola delle Femmine (Palermo, Sicilia)**

*MPA Code: EUAP0555*

*Managing Authority: Management Consortium*

*Creation Law: Ministry Decree 24<sup>th</sup> July 2002*

*Sea surface: 2.173 hectares*

<http://www.ampcapogallo-isola.gov.it/istituzionale/>

The MPA is located in the north-western area of Sicily, and involves the coastline belonging to the Municipalities of Palermo and Isola delle Femmine, over 16 km long, from Mondello to Capaci.

The seabed is characterized by tunnels and caves produced by the endless erosion of the waves.

'The Punic Wreck': one of the most beautiful caves, half-submerged, is the Grotta dell'Olio; its seabeds, filled with coloured flora and fauna, host the wreck of a Punic ship, well preserved with its amphorae cargo.

'Junkers-52': Off the coast of Sferracavallo a big three-engined German World War II airplane, fallen in the summer of 1942, lies on a sandy seabed at -45 meters. The fuselage, with the whole tail and the cockpit, is buried in the sand while the invisible wings, with two engines, are still perfectly intact. Towards the rear there is a large block which is perhaps the central engine probably torn during the recovery efforts by the derrick. The access ladder inside the fuselage is perfectly preserved.

<http://www.minambiente.it/pagina/area-marina-protetta-capo-gallo-isola-delle-femmine>

<http://www.naturaitalia.it/apriAreaNaturale.do?idAreaNaturale=29&numeroPuntoInformativo=1&maptype=deag>

### **Marine Protected Area – Tremiti Islands (Gargano, Puglia)**

*MPA Code: EUAP0168*

*Managing Authority: Gargano National Park*

*Creation Law: Ministry Decree 14<sup>th</sup> July 1989*

*Sea surface: 1.466 hectares*

<http://www.parcogargano.gov.it/servizi/Menu/dinamica.aspx?idArea=17732&idCat=17732&ID=17732&TipoElemento=area>

San Domino, San Nicola, Capraia, Cretaccio e Pianosa islands, are less than 300 hectares in front of the Gargano northern coastline. They are MPAs since 1989, and part of the Gargano National Park since 1991.

Emerged and submerged several times in their geological history, the islands and their seabeds, in calcareous rock, host several underwater caves and tunnels. The archipelago in ancient times was known as “Diomedes’ Islands”, thanks to the legend of Diomedes. The Odyssey hero, escaped from his homeland Tracia, went ashore on the Gargano coastline and founded a new kingdom, the ‘Daunia’.

To mark its borders, he threw some big rocks carried from Tracia: the ones thrown in the sea became the Tremiti Islands. The same legend tells that when Diomedes passed away, his desperate companions were transformed in marine birds, called ‘Diomedes’, which are still crying their king. The islands seabed is filled with hidden treasures and very significant archaeological discoveries took place in these waters. Only the most important ones are listed below:

Wreck ‘A’ - Tre Senghe: Roman cargo ship from the I century BC.

In 1981-1982 an extraordinary discovery was done some 100 meters off the southern coastline of San Domino island, between ‘Cala di Zio Cesare’ and ‘Punta del Diavolo’: 25 meters deep, the wreck of a Roman ship carrying more than 900 amphoras.

Turkish galley from XVI century: in 1566 the Turkish navy tried to conquer the Tremiti Islands, thus not succeeding. Close to the Cala dei Benedettini, this wreck, 30 meters deep, testifies this attempt by one of the Turkish warships, bearing, among other artifacts, four precious bronze cannons.

Steamboat "Il Lombardo", XVIII century: close to the Cala degli Inglesi, the ship was one of those used by the Italian hero Giuseppe Garibaldi during the "Spedizione dei Mille" in 1860. The ship sank in March 1864, four years later the glorious enterprise, while transporting prisoners towards Manfredonia, and lies at a depth of 30 meters.

<http://www.minambiente.it/pagina/area-marina-protetta-isole-tremiti>

## **Marine Protected Area - Penisola del Sinis - Isola di Mal di Ventre (Oristano, Sardinia)**

*MPA Code: EUAP0951*

*Managing Authority: Municipality of Cabras*

*Creation Law: Ministry Decree 12<sup>th</sup> December 1997*

*Sea surface: 25.673 hectares*

[http:// www.areamarinasinis.it/](http://www.areamarinasinis.it/)

The Marine Protected Area of "Peninsula of Sinis - Isola di Mal di Ventre" was established according to Law 979 of 1982. According to the Ministerial decree n. 188 of 20 July 2011, the protected sea area has been extended and covers approximately 25,000 hectares, divided into zones of different degrees of protection. The establishment of zones "A", "B" and "C" differ with respect of the usage of the area and contribute towards its sustainable use.

'Lingotti Wreck': Roman cargo ship, I century BC. In the sea strip between the Sinis coastline (6 miles off) and the Mal di Ventre Island (1 mile south west), at a depth of 30 meters, lies the wreck of a roman ship carrying lead ingots. The ship, 36 meters long and 12 meters wide, is well preserved only in the central sector (10 sqm). The about 1000 ingots, are mostly still piled up and aligned in the original position, testifying the slow, vertical sinking of the ship. Close to the wreck there are also four lead anchors, two lead plumbs, some leaden pipeline, some lava millstones, a few amphoras, pottery for onboard use, an iron sword and about 200 lead ammunitions. The analysis on the ingots identified the lead origin in Sierra of Cartagena, Spain, possibly the starting point of the ship's route, while the destination is still unknown.

<http://www.parks.it/area.marina.protetta.penisola.sinis/iti.php>

<http://www.minambiente.it/pagina/area-marina-protetta-penisola-del-sinis-isola-di-mal-di-ventre>

### **Marine Protected Area - Tavolara - Punta Coda Cavallo (Olbia, Sardinia)**

*MPA Code: EUAP0952*

*Managing Authority: Consortium of the Municipalities of Olbia, San Teodoro and Loiri Porto San Paolo*

*Creation Law: Ministry Decree 12<sup>th</sup> December 1997 - Ministry Decree 28<sup>th</sup> Nov. 2001*

*Sea surface: 15.357 hectares*

[www.amptavolara.com](http://www.amptavolara.com)

The MPA is located on the north-east of Sardinia, and includes the islands Tavolara, Molara and Molarotto and the coastline from Capo Ceraso until Cala Finocchio. Its important natural values, enriched by a spectacular landscape, give this area an international importance in terms of naturalistic preservation. Several wrecks from the modern age lie in its seabeds:

A fighter-bomber airplane 'Caproni-Reggiani', fallen in 1943 close to Tavolara island.

Two fishing motorships and a submarine: 'San Giuseppe', 40 meters deep, sunk in 1949 close Tavolara and the schooner 'Amalia', sunk in July 1943 after being attacked by a submarine, which also lies 40 meters deep in this area.

Five cargo motorships from World War II years: the 'Oued Yquem' lies 36 meters deep close to San Teodoro, hit by a torpedo launched 1941 by a Dutch submarine.

The 'Klearchos Wreck': because of a fire onboard, in 1979 was abandoned in the sea strip between Tavolara and Molara, and now lies at -74 meters.

The 'Omega Wreck': a ship that in February 1974 wrecked against the 'Seven Brothers' rocks, near Molara, rapidly sinking at -18 meters.

The 'Chrisso Wreck', the only one emerging from the water, near 'Punta la Greca'. A Cyprus ship built in 1958, it got stuck in the shallows the night of 31<sup>st</sup> December 1974, during a wind storm. For a long time the ship awaited to be recovered and repaired, but a fire destroyed the cockpit and the ship was definitely abandoned. Now the ship is broken in two sectors, because of the storm surges, and most of it sunk at -5 meters.

<http://www.amptavolara.com/en/home-page/>

<http://www.amptavolara.com/en/territory/zonification/>

<http://www.parks.it/riserva.marina.tavolara/iti.php>

### **Marine Protected Area - Capo Caccia - Isola Piana (Alghero, Sardinia)**

*MPA Code: EUAP0554*

*Managing Authority: Municipality of Alghero*

*Creation Law: Ministry Decree 20<sup>th</sup> September 2002*

*Sea surface: 2.631 hectares*

<http://www.ampcapocaccia.it/>

The Marine Protected Area of Capo Caccia – Isola Piana covers a surface of 2.631 hectares. It was identified as a marine reserve based on law 979 of 1982 and was established as such by the Ministerial Decree dated on the 20<sup>th</sup> September 2002. The Marine Protected Area of Capo Caccia-Isola Piana is managed by the Municipality of Alghero. The site of Cala Barca (Capo Caccia, Alghero, Sassari) near Isola Piana, off the north western coast of Sardinia presents two shipwrecks known since 30 years:

Roman ship, I century AD. In an area 80 x 30 meters wide, and at a depth of 20 meters, the wreck of a Roman cargo ship shows the transported items: rectangular bricks, some still piled up, and amphoras type Dressel 7-11.

French Vessel, end from the XVIII century. In the same area of the Roman ship, two meters deeper, lie some cannons, long rifles and ammunitions. A wooden case

containing clothes, boots and some antimonium dishes. The vessel, identified as the 'Le Tigre' ship, beared 30 cannons and sunk in september 1664; none of the 64 crew members survived.

<http://www.ampcapocaccia.it/>

<http://www.parks.it/amp.capo.caccia/iti.php>

### **Marine Protected Area – Cinque Terre (Porto Torres, Sardinia)**

*MPA Code: EUAP0948*

*Managing Authority: National Park Cinque Terre*

*Creation Laws: Ministry Decree 12<sup>th</sup> December 1997; Ministry Decree 9<sup>th</sup> November 2004*

*Sea surface: 4.591 hectares*

*<http://www.parconazionale5terre.it/area-marina-protetta.php>*

The AMP is located in the eastern part of the Levante Ligure coast, west of Porto Venere. It preserves the coastline between Punta Mesco and Capo Montenegro for almost 20 km. Some morern age wrecks testify the intense war activities in these waters during World War II:

Submarine Chaser 'Egua': close to Riomaggiore, at a depth of 34-41 meters, an Italian warship sunk in june 1944, hit by 'frendly fire'.

After 8th September 1943 Kriegsmarine confiscated the ship and gave it to the Italian Social Republic Navy, to fight Allied submarines in the northern Thyrrhenian sea.

In 1944, 2 miles off the La Spezia harbor, it was rammed by mistake by the German submarine UJ2220 (U-Boot-Jagd im Mittelmeer ISBN 3-8132-0801-x – lead by Manfred Krellenberg).

The ship sunk in navigation trim, and the wreck is well preserved, still pointing the prow cannon towards a long gone enemy.

Off Monterosso coastline, a german landing craft sunk during World War II lies leaned on one side at -46 meters.

<http://www.minambiente.it/pagina/area-marina-protetta-cinque-terre>

<http://www.parks.it/riserva.marina.cinque.terre/index.php>

### **Marine Protected Area - Costa degli Infreschi e della Masseta (Salerno, Campania)**

*MPA Code: EUAP1228*

*Managing Authority: National Park Cilento and Vallo di Diano*

*Creation Laws: Ministry Decree 21<sup>st</sup> October 2009*

*Sea surface: 2.332 hectares*

*<http://www.cilentoediano.it/>*

The MPA is located in front of Salerno, protecting a coastline of 14 km between Punta dello Zancale (Camerota) and Punta Spinosa (San Giovanni a Piro). The public authority managing the 'Cilento, Vallo di Diano e Alburni National Park' takes also care of the MPA, considered its marine extension. Among others, three important wrecks lie under these waters:

Punta della Quaglia Wreck: a Roman cargo ship.

Post medieval vessel: it's extraordinarily well preserved, in spite of the devastating fishing activities conducted in the area during the last decades. It lies on the seabeds of Punta degli Infreschi, near Camerota.

Wooden ship from the early XX century located in Giardini di Scario Municipality of San Giovanni a Piro.

<http://www.minambiente.it/pagina/area-marina-protetta-costa-degli-infreschi-e-della-massetta>

<http://www.cilentoediano.it/sito/arre-marine-protette/infreschi>

### **Marine Protected Area - Asinara Island (Porto Torres, Sardinia)**

*MPA Code: EUAP0552*

*Managing Authority: National Park Asinara*

*Creation Laws: Ministry Decree 13<sup>th</sup> August 2002*

*Sea surface: 10.732 hectares*

<http://www.parcoasinara.org/>

The Marine Protected Area of Asinara Island was established in 2002 and belongs to the Municipality of Porto Torres. The marine environment of Asinara island has a particular valuable scientific interest. It is mainly characterized by a high integrity and diversity of the floral-faunistic communities, and has a considerable valuable landscape, with clear waters as far as concerns chemical pollution factors.

Its marine habitat is extremely rich and with a high degree of biodiversity, due to the diverse aspect of the coastline, showing steep cliffs and rocks on the western side, and sandy beaches with shallow seabeds on the eastern side.

The most important UCH site of this area is the so called 'Cala Reale Underwater Archaeological Deposit': it's a site, 300 meters off Cala Reale harbour, where a Roman ship from the late imperial age, coming from Portugal coasts, sunk while transporting garum amphoras and salty fish.

Over 40.000 artifacts and fragments have been found in this site, and the area is now a diving trail. Visitors can see the site also with a glass-bottomed boat.

<http://www.parcoasinara.org/>

<http://www.comune.porto-torres.ss.it/Comunicazione/Argomenti/Porto-Torres-Turismo/Da-visitare/Isola-dellAsinara/Giacimento-archeologico-subacqueo-di-Cala-Reale-Asinara>

### **Marine Protected Area - Portofino (Genova, Liguria)**

*MPA Code: EUAP0949*

*Managing Authority: Consortium of the Municipalities of Portofino, S. Margherita Ligure, Camogli, the Province of Genova, and the Genova University*

*Creation Laws: Ministry Decree 6th June 1998 - Ministry Decree 26th April 1999*

*Sea surface: 346,00 hectares*

<http://www.portofinoamp.it/it/>

The MPA, located in the Levante Ligure coastline between Camogli, Santa Margherita Ligure and Portofino, has been declared SPAMI area (Especially Protected Area of the Mediterranean Sea). The submerged cliffs of the Promontorio di Portofino host a huge variety of marine flora and fauna, almost unique in the Mediterranean Sea.

Not many wrecks from the classical period have been found here so far: probably most of them completely disappeared or are still covered by the sand. Nevertheless, many historical and modern age shipwrecks lie under these waters:

Greek and Roman amphoras close to Punta del Faro: at a depth of 80 meters, the prevailing presence of Greek amphorae leads to suppose the Portofino harbor active since the pre Roman age.

Roman cargo ship, II century BC. Close to Punta Chiappa, a huge number of amphoras testifies the wreck of a roman navis oneraria: some of them are still piled up in the original position.

Caracca Santo Spirito, 1579: during a windstorm, the three-masted Spanish cargo vessel, declared contaminated and was denied docking at the Genova harbor. The vessel then traveled close to the coastline, heading towards Portofino harbour, and sadly wrecked on the rocks. Only part of the crew survived. The ship was carrying precious tissues and artwork weapons, which the Spanish ambassador tried to retrieve sending expert swimmers from Spain. The mission failed and probably, during the following years, part of the artifacts was taken away from the locals.

Roman Navy ship, I century AD: close to S. Michele di Pagana a big anchor and pottery commonly used by roman soldiers have been found on the seabed.

Schooner from the first half of XX century.

'Croesus' - British steamboat, 1855: the ship sunk after an accident in front of S. Fruttuoso. Parts of the wrecked ship have been retrieved during the years.

'Washington', British cargo, 1917: the steamboat was carrying railway building materials and metals (steel, copper and manganese) from the United States when, in 1917, was hit by a torpedo launched by an Austrian or German submarine, and sunk off the Punta Chiappa coastline.

'Genova', Italian cargo, 1917: the ship was transporting war supplies, and was hit by a German torpedo, slowly sinking away from the coastline.

'Ischia' Italian cargo ship, 1943: hit by a torpedo launched by the British submarine Torbay, while navigating between La Spezia and Genova, on February 28<sup>th</sup>. It sunk only 500 meters off the Punta Chiappa coastline, and almost all the survivors reached the land swimming in the cold waters.

German U-Boot, World War II: lying on the deep seabed in front of Cala dell'Oro.

Mohawk Deer, Canadian tank ship, 1967: while it was pulled by two tug boats from the Genova harbor towards La Spezia, the ropes got broken due to a windstorm, and the big ship ended on the rocky coastline of Promontorio di Portofino. The retrieval operations failed, and after a few hours the ship got broken in two sectors and sunk close to Cala degli Inglesi.

Landing craft, World War II: off Punta Pedale, near Santa Margherita Ligure harbor, on a seabed deep 35 meters, a ship used for supplies transportation sunk probably during a bomb attack by RAF airplanes. The ship is almost intact, but lying upside down, showing its three xelix system.

Handley page Halifax, British fighter bomber airplane, 1942: hit by anti-aircraft artillery off the Promontorio di Portofino.

Bettolina (German cargo ship), World War II: it sunk off the Baia del Silenzio, close to Sestri Levante, while transporting concrete bags, still in the hold.

The cockpit and the kitchen are still intact and filled with instruments and tools; the helix and the wheel are lying on the seabed close to the wreck, at -30 meters.

<http://www.minambiente.it/pagina/area-marina-protetta-cinque-terre>

## **Marine Protected Area - Ventotene and Santo Stefano islands (Latina, Lazio)**

*MPA Code: EUAP0947*

*Managing Authority: Municipality of Ventotene*

*Creation Laws: Ministry Decree 12<sup>th</sup> December 1997*

*Sea surface: 2.799 hectares*

<http://www.riservaventotene.it/>

The Marine Protected Area of “Ventotene and Santo Stefano” islands was established on the 12<sup>th</sup> December 1997 (GU n° 45, 24.2.1998). The area is located in the province of Latina, in the sea surrounding the islands of Ventotene and Santo Stefano. Due to the geomorphological characteristics of the area, which is characterized by a shallow seabed, the marine flora and fauna found between the two islands is of great biodiversity (<http://www.riservaventotene.it/>).

Five underwater Archaeological Sites have been so far identified:

Site 1: Roman ship, I century AD. Well preserved wreck, 15 meters long and 5 meters wide. The ship was carrying amphoras for the transportation of Garum (Roman fish sauce). Several amphoras are still piled up in the original position.

Site 2: Roman ship, I century BC. very well preserved wreck 18 meters long and 5 meters wide, carrying amphoras filled with italian wine from Campania. Several amphoras are still piled up in the original position.

Site 3: Roman ship, I century AD. A Roman ship 13 meters long and 4 meters wide wrecked and got broken in two sectors while carrying a load of amphoras filled with italian wine from Campania and stone mortars (mortaria).

Site 4: Roman ship, I century AD. A Roman ship 20 meters long and 5 meters wide carrying amphoras filled with italian wine, and other glass and metallic artifacts.

Site 5: Roman ship, V century AD. The ship was carrying North African amphoras for with Garum. Several amphoras are still piled up in the original position.

### **Marine Protected Area - Egadi islands (Trapani, Sicily)**

*MPA Code: EUAP0172*

*Managing Authority: Municipality of Favignana*

*Creation Laws: Inter-Ministries Decree 21<sup>st</sup> December 1991; Inter-Ministries Decree 6<sup>th</sup> August 1993 – Ministry Decree 17<sup>th</sup> May 1996*

*Sea surface: 53.992 hectares*

<http://www.ampisoleegadi.it/>

About nine miles off the South-western coastline of Trapani there are the islands of di Favignana, Marettimo and Levanzo, and the rocks Formica and Maraone. These minor and faraway islands are peculiar under many aspects, like habitat and natural, historical and anthropic characteristics.

The wild and untouched beauty meets a clear sea rich of fish species, rocky coastlines with cliffs and caves, white sandy beaches and amazingly coloured seabed filled with marine life and remains of the most ancient civilizations of the Mediterranean Basin. The Egadi Islands are located along the main trade route between Africa and Europe, in western Sicily, and thus recognized as EU Important Sites (ITA10002, ITA10003, ITA10004, ITA10024) and Special Protected Areas (ITA10027 e ITA10028) according to the 92/43/CEE "Habitat Directive".

The seabed of Levanzo is particularly rich in marine life as well as in treasures of immense historical and archaeological value. Among others, two important archaeological sites are dated back to the punic-roman age:

'Wreck of Cala Minnola', where at a depth of 25 meters there are 80 well preserved roman amphoras and black glazed pottery. The nature of the wreck, its cargo and location indicate a possible association with the annona service supplying Rome.

'The anchors of Capo Grosso', which the expert attribute to the Roman fleet which in these waters attacked the Carthaginians in the historic Egadi's battle, during the first Punic War (200 b.C.).

### **Marine Protected Area – Porto Cesareo (Lecce, Puglia)**

*MPA Code: EUAP0950*

*Managing Authority: Consortium of Municipalities of Porto Cesareo and Nardò and of the Province of Lecce*

*Creation Laws: Ministry Decree 12<sup>th</sup> December 1997*

*Sea surface: 16.654 hectares*

<http://www.ampportocesareo.it/>

The AMP covers over 32 km of coastline in the eastern part of the Taranto Gulf, the northern end of Ionian Sea, going from Punta Prosciutto to Torre Inserraglio. Included in 2011 in the SPAMI list (Special Protected Area of the Mediterranean Sea), with the code IT08, is one of the few with a complete seabed mapping, which revealed the existence of more than 15 different marine habitats.

U.S. Navy Wreck: between S. Isidoro and Torre Inserraglio, about 2 miles off the coastline, at a depth of - 33 meters, a U.S. Navy warship lies on the sandy seabed, sunk during World War II. Its cargo consisted in supplies: food and military equipment (gas masks, spare parts, varnishes, etc.)

Roman Columns: near Torre Chianca, only 5 -7 meters deep, a series of Cipollino marble columns lie aligned on the seabed since the II century BC.

<http://www.minambiente.it/pagina/area-marina-protetta-porto-cesareo>

### **Marine Protected Area – Punta Campanella (Napoli, Campania)**

*MPA Code: EUAP0946*

*Managing Authority: Consortium of Municipalities of Piano di Sorrento, Vico Equense, Massa Lubrense, Sorrento, Sant’Agnello and Positano*

*Creation Laws: Ministry Decree 12<sup>th</sup> December 1997; Ministry Decree 13<sup>th</sup> June 2000*

*Sea surface: 1.539 hectares*

<http://www.puntacampanella.org/>

Punta Campanella is the strip of land linking the Sorrento peninsula to the Amalfi Coast, leaning towards Capri Island. The MPA protects over 40 km of coastline and it is classified as SPAMI (Special Protected Area of the Mediterranean Sea).

Its seabeds, despite the endless spoliation of the last sixty years, still testify the intense maritime trade activities in this area, and the particularly dangerous nature of this waters, through several precious remains. A Roman ship fleet with Julius Caesar wrecked on this coastline, according to historical documents, and this is a place where several ships ended their routes: a number of wrecks from the pre-Roman and Roman period are located nearby the Vetara Island shallows, close to the Punta and off the Massa Lubrense coastline. Fishermen’s nets still gather amphoras, lead plumbs and stone anchors dated from the Etruscan, Greek, Roman, Medieval periods. Off the coastline near the Roman villa’s harbors hundreds of marble architectural elements and artifacts are still lying on the seabed.

This area, so far almost neglected by the underwater archaeologists, is potentially one of the most interesting in the Country.

<http://www.parks.it/riserva.marina.punta.campanella/index.php>

<http://www.minambiente.it/pagina/area-marina-protetta-punta-campanella>

## Underwater Trails

### Underwater Trail - San Pietro in Bevagna (Taranto, Puglia)

The site of the sarcophagi from the wreck of San Pietro in Bevagna, III Century AD, is located approximately 100 m from the coast and 4-6 m in depth. It covers an area of approximately 148 sqm and contains twenty-two partially worked white marble sarcophagi of diverse shapes and sizes, each weighing between 1000 and 6000 kg.

<http://www.academia.edu/12014511/R. PETRIAGGI B. DAVIDDE The sarcophagi from the wreck of San Pietro in Bevagna TA>

### Underwater Trail - Egnazia (Fasano, Puglia)

This trail includes a visit to the Roman port which has two long piers.

<http://www.egnaziaonline.it/>

### Underwater Trail - Pyrgi (Roma, Lazio)

The divers can visit the ancient remains of Etruscan wells and the remains of architectural structures dated in the Roman period.

<http://www.poseidon-usr.com/images/Depliant%20Archeo-Diving%20Pyrgi.pdf>

### Main Underwater Trails - Liguria

Modern shipwrecks in Riviera di Ponente (from Genova to Ventimiglia)

- Haven
- UJ 2208 Alfred
- V.A.S
- Pelagosa
- Calabria

Modern shipwrecks in Riviera di Levante (from Genova to La Spezia)

- KT Sestri
- Cargo Armato
- Foce
- Marcella
- Bolzaneto

<http://www.relittiliguria.it/>

### Main Underwater Trails - Sicily

In the Marine Protected Areas of Sicily, a visitor can admire more than 23 Underwater Archaeological Sites available for diving through Underwater Trails.

<http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/itinerari.htm>



**Figure 7:** The main Underwater Cultural Heritage sites of Sicily

1. Ustica, Punta Falconiera: The archaeological artifacts are scattered over an area of about 500 sqm, with a spreading distance of less than 20 m. In this area, there are several remains of pottery, an iron anchor, a stamp of a mobile Roman lead anchor, a Roman lead anchor collar and a Byzantine anchor. The maximum depth there is around 35 meters. For more information: [http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez\\_itinerari/itinerario\\_ustica\\_falconiera.htm](http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez_itinerari/itinerario_ustica_falconiera.htm)
  
2. Ustica, Punta Cavazzi: This underwater trail is found in 10 to 24 m depth and is marked by a buoy. A visitor can see there many ancient anchors, dated mainly from the Roman and Byzantine period. For more information: [http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez\\_itinerari/itinerario\\_ustica\\_gavazzi.htm](http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez_itinerari/itinerario_ustica_gavazzi.htm)
  
3. Aspra, Mongerbino: This trail covers an area of about 150 m in length with a depth between 15 and 30 meters. There are at least six concretioned iron anchors from the Hellenistic to the Byzantine's era. For more information: [http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez\\_itinerari/itinerario\\_aspra\\_mongerbino.htm](http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez_itinerari/itinerario_aspra_mongerbino.htm)

4. Cefalù, Kalura: this underwater trail includes the structures of an artificial ancient port of about 50 m long and 15 m wide, located at a maximum depth of 8 m. and has some wooden poles fixed at the bottom. Due to the shallow depths of the trail, it is enjoyed by both novice divers and snorkelers. For more information:  
[http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez\\_itinerari/itinerario\\_cefalu\\_kalura.htm](http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez_itinerari/itinerario_cefalu_kalura.htm)
  
5. Filicudi, Capo Graziano: this underwater trail includes archaeological artifacts like a lithic anchor, a ballast of a ship, a lithic Greek anchor, and ceramic fragments scattered in an area of around 30 meters. At a 30-m depth, a visitor can see the observation deck used for the examination of the second century's B.C. wreck "A. Roghi", which contains *in situ* about 60 amphoras found at a depth of 36 m. For more information:  
[http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez\\_itinerari/itinerario\\_filicudi\\_capo%20graziano.htm](http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez_itinerari/itinerario_filicudi_capo%20graziano.htm)
  
6. Panarea, Basiluzzo: this underwater trail has a maximum depth of 18 m and consists of some gas fumaroles and submerged wall structures. The divers can easily get into the perimeter and appreciate the connection between the natural rocks and the wall structures. For more information:  
[http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez\\_itinerari/itinerario\\_panarea\\_basiluzzo.htm](http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez_itinerari/itinerario_panarea_basiluzzo.htm)
  
7. Taormina, Relitto delle Colonne: this underwater trail has a maximum depth of 27 m. and shows the remains of the cargo of the Imperial period's wreck *Navis Lapidaria* II Century A.D. Its cargo includes at least 37 columns and two rectangular blocks, all made by Greek marbles. For more information:  
[http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez\\_itinerari/itinerario\\_taormina\\_colonne.htm](http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez_itinerari/itinerario_taormina_colonne.htm)
  
8. Acitrezza-Capo Mulini, Isole dei Ciclopi: this underwater trail, has a maximum depth of 22 meters, and includes eight iron anchors dated to a period between the Roman and early Middle Ages. It is the so-called "tactile project", accessible even to the blind or disabled divers, due to the Braille information signs located underwater and some ceramic copies placed along the trail to allow a tactile experience. For more information:  
[http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez\\_itinerari/itinerario\\_acitrezza\\_isole%20ciclopi.htm](http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez_itinerari/itinerario_acitrezza_isole%20ciclopi.htm)

9. Noto, Relitto delle Anfore: this offshore underwater trail is located two miles from the coast of Noto, at a maximum depth of 45 m and consists of several wine amphoras from the cargo of an ancient ship dated between mid-IV and 1<sup>st</sup> quarter of III century B.C. For more information: [http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez\\_itinerari/itinerario\\_noto\\_relitto%20anfore.htm](http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez_itinerari/itinerario_noto_relitto%20anfore.htm)
  
10. Marzamemi, Relitto delle Colonne: this underwater trail consists mostly of semi-finished columns and squared blocks from a Roman ship's cargo dated to the III century B.C. No wooden elements of the ship can be found though, since the sea totally eroded them. At a maximum depth of 8 meters, the site is available for snorkelers too. For more information: [http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez\\_itinerari/itinerario\\_marzamemi\\_colonne.htm](http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez_itinerari/itinerario_marzamemi_colonne.htm)
  
11. Capo Passero, Relitto dei Marmi: this trail, with a maximum depth of 6 m, shows a Roman wreck called "The wreck of the Island of Currents", which has a cargo of about 40 Proconnesian marble blocks of various sizes. According to the studies the wreck sank in the III century A.D. For more information: [http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez\\_itinerari/itinerario\\_capo%20passero\\_marmi.htm](http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez_itinerari/itinerario_capo%20passero_marmi.htm)
  
12. Pantelleria, Cala Gadir: this underwater trail includes several traces of wreckages from different cultural periods, plus a wooden fragment of a ship, a group of six Punic and Roman amphoras, a stamp of a Roman lead anchor, some hills of amphoras and a fragment of a Greek-Italic amphora. The maximum depth in this site is 30 meters. For more information visit: [http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez\\_itinerari/itinerario\\_pantelleria\\_gadir.htm](http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez_itinerari/itinerario_pantelleria_gadir.htm)
  
13. Pantelleria, Cala Tramontana: this trail shows several archaeological findings, like some fragments of Punic amphoras, some Greek-Italic amphoras, lithic anchors, a lithic milestone, an imperial age amphora, a stamp of a stone's anchor and several ceramic fragments. The maximum depth in this trail is about 18 meters. For more information:
14. [http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez\\_itinerari/itinerario\\_pantelleria\\_tramontana.htm](http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez_itinerari/itinerario_pantelleria_tramontana.htm)
  
15. Pantelleria, Punta li Marsi: this underwater trail has a maximum depth of 24 meters and begins with a trapezoidal lithic anchor at the depth of 16 meters.

A visitor can then observe, at 23 meters depth, several anchors, some dated in earliest times, and also an amphora's neck with two handles.

For more information visit:

[http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez\\_itinerari/itinerario\\_pantelleria\\_limarsi.htm](http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez_itinerari/itinerario_pantelleria_limarsi.htm)

16. Pantelleria, Punta Tracino: the Punta Tracino's promontory is a natural shelter area for ships in danger. In fact, this place was full of findings with a chronological extension from VI-IV century B.C. to the Byzantine era. There the visitor can see some amphoras and a variety of anchors, including a lithic arcaic anchor, a lead anchor, and an iron Byzantine anchor. For more information visit:

[http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez\\_itinerari/itinerario\\_pantelleria\\_tracino.htm](http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez_itinerari/itinerario_pantelleria_tracino.htm)

17. Pantelleria, Punta Tre Pietre: this trail has a maximum depth of 28 meters and shows many lithic anchors with various shapes and sizes. For more information visit:

[http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez\\_itinerari/itinerario\\_pantelleria\\_trepietre.htm](http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez_itinerari/itinerario_pantelleria_trepietre.htm)

18. Marsala, Capo Boeo: this trail is in the ancient port of Lilibeo, which was founded after the Mozia's destruction in 397 B.C. and reaches the maximum depth of 10 meters. The area is full of ceramic fragments from the Hellenistic period (IV century B.C. ) to the late Roman period ( V century A.D. ), in the seabed there are also some building remains, which were thrown into the water probably during the Vandal's raids. For more information visit:

[http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez\\_itinerari/itinerario\\_marsala\\_capoboeko.htm](http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez_itinerari/itinerario_marsala_capoboeko.htm)

19. Marettimo, 'Cannons Wreck': this underwater trail consists of some 1700 warship artifacts lying on an area of about 1500 sqm, 100 m from the coastline, at a depth of 15 m. There are at least 9 cannons with balls and other metallic elements, among which there is a lead ingot and a triangular metallic element. A visitor can also see in this area an admiralty anchor. For more information visit:

[http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez\\_itinerari/itinerario\\_marettimo\\_cannoni.htm](http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez_itinerari/itinerario_marettimo_cannoni.htm)

20. San Vito Lo Capo, 'Amphorae Wreck': this trail has a maximum depth of 18 meters and a seabed full of amphoras. For more information visit:  
[http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez\\_itinerari/itinerario\\_san%20vito\\_anfore.htm](http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez_itinerari/itinerario_san%20vito_anfore.htm)
  
21. San Vito Lo Capo, 'Millstone's Wreck': this trail, with a maximum depth of 18 meters, covers an area of 1000 sqm and includes findings from IV century BC to XVI century AD. A visitor can see a shipwreck with its cargo of 50-60 rhomboid rubbing grinders and a stone anchor. Under the cargo, there are some amphora's fragments, which useful to date the shipwreck back to the IV-V century AD. For more information visit:  
[http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez\\_itinerari/itinerario\\_san%20vito\\_macine.htm](http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez_itinerari/itinerario_san%20vito_macine.htm)
  
22. San Vito Lo Capo, Relitto del Kent: this trail has a maximum depth of 54 meters and includes a modern cargo motor ship named "The Kent", also known as "The ship of the Korans", due to the load of Korans, mosquito repellents and cigarettes. This Cypriot ship sank in 1978, due to a fire. For more information visit:  
[http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez\\_itinerari/itinerario\\_san%20vito\\_kent.htm](http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez_itinerari/itinerario_san%20vito_kent.htm)
  
23. Scopello, Faraglioni: this trail is in an ancient anchorage site where several types of amphoras and artifacts (e.g. Greek, Punic, African, and Spanish ceramics) can be found at a maximum depth of 18 meters. A visitor can also see a lithic anchor, various amphora's necks and a white millstone used probably as a ballast. For more information visit:  
[http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez\\_itinerari/itinerario\\_scopello\\_faraglioni.htm](http://www.regione.sicilia.it/beniculturali/archeologiasottomarina/sez_itinerari/itinerario_scopello_faraglioni.htm)

## Italian Legislative Framework

### Current legislation about cultural heritage safeguarding

The safeguarding of Underwater Cultural Heritage in Italy follows the same principles adopted for the archaeological heritage underneath the ground.

Those principles, declared through the **UNESCO Convention on the Protection of the Underwater Cultural Heritage (Paris, 2 November 2001)**, and ratified by the Italian Government through **the Law n. 157, 23 October 2009**, became **effective in Italy starting from 8 April 2010**.

Before 2010, however, the **Italian Unified Code on the Protection of Cultural Heritage and Landscape (Law n. 42, 22 January 2004)**, through its article n. 94, already referred to the UNESCO Convention regarding the safeguarding policy of the underwater archaeological heritage. This Law is the one effective nowadays.

### Specific legislation about marine natural and cultural areas

**Law for the Protection of the Sea n. 979/1982:** Articles 25 to 32 aim to create, list and describe the MPAs, their requirements and their policies related to leisure, productive, fishing and commercial activities.

**Framework Law on Protected Areas n. 394/1991** lists the national parks, the regional parks and the other protected areas (land, rivers, lakes and seas) and rules their management and protection policies.

Its objectives are:

- The preservation of flora, fauna, habitats, landscapes, geological and paleontological values, hydrogeological and ecological systems;
- The application of management and conservation methodologies aimed at safeguarding anthropologic, archaeological, historical and architectural values;
- the promotion of activities related to education, formation, research, dissemination and compatible leisure. **Articles 18 and 19 state the institution and the management policy for the Marine Protected Areas.**

**Law n. 61 of 8 February 2006**, concerning the **institution of Marine Protected Areas beyond the territorial sea limit** (12 miles off the coastline): it states that the protection of marine natural and archaeological/historical heritage, according to the UNESCO Convention guidelines, must be extended between 12 and 24 miles off the national coastline.

## CROATIA

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In the Republic of Croatia there are strategies that are related to a given topic, but there is legislation that comprises the method of issuing permits for tourist diving at underwater cultural goods. Principle which is obtained in this way is unique in the world, because on the one hand there is the permeation of cultural heritage and tourism, and on the other hand represents a special form of seabed protection.

The practice about diving at underwater cultural heritage in Croatia can be a positive example and a proposal of common methodology for tourist activities on underwater cultural heritage. More about this will be shown below.

### **Analysis of the underwater museums and diving parks**

In Republic of Croatia there are no formal underwater museums and diving parks. However, through the Act on the Protection and Preservation of Cultural Goods (“NN” br. 69/99, 151/01, 157/03, 87/09, 88/10, 61/11, 25/12, 136/12, 157/13 i 152/14), the following categories were defined:

- individual registered underwater cultural goods
- individual preventively protected underwater cultural goods
- registered underwater archeological zones
- preventively protected underwater archaeological zones

In a broader sense, all such categories can be in some way considered underwater museums and parks diving parks, because for most of them there is no legal, theoretical and practical framework, by which visits to the vast majority of those underwater archaeological zones and localities can be organized.

The difference between registered and preventively protected sites is that registration represents a continuing, and preventive care of only temporary protection (6 years from the date of issuing a Decision on preventive protection). In addition to these legally protected cultural goods for which the Decision on registration or preventive protection is issued, there are also evidenced underwater cultural goods. These are mostly underwater archaeological sites which are known in professional circles, scientific literature and similar, but for them there is not enough data to be adopted and adequate legal protection. The procedure for adopting the Decision on registration or preventive protection, in addition to the mentioned Act, is regulated by the Ordinance on the form, content and manner of keeping the Register of Cultural Goods of Croatia (NN 89/11 i 130/13).

## **LIST OF REGISTERED AND PREVENTIVELY PROTECTED UNDERWATER CULTURAL GOODS AND UNDERWATER ZONES**

Hereinafter an overview of registered and preventively protected individual cultural goods and of underwater archaeological zones will be given.

The overview of stated categories will be presented per counties, cities and municipalities as administrative units. In the overview, first is indicated the place, then the immediate area, the number of protection (from the Register of Cultural Goods of Ministry of Culture), type of finding site and finally a brief description.

### **I Individual Registered Cultural Goods**

#### **1. ISTRA COUNTY**

##### **1.1. MUNICIPALITY OF KRŠAN**

- BRESTOVA, Brestova, Z - 244

Description: Modern Age shipwreck, wreck of a warship TA-36 (“Stella Polare”).

The wreck of a sunken warship TA-36 (Stella Polare) is located approximately 800 meters south of dock Brestova. The ship was built in 1943 in Rijeka for the Italian navy. Later was taken over by the Germans. According to the class the ship was an escort destroyer with the dimensions 82x8x3 and with a crew of 160 people. The ship sank in March 1944 after hitting a mine. The bow was separated in the explosion, while the conning tower and the stern are remarkably well preserved.

##### **1.2. MUNICIPALITY OF MEDULIN**

- PREMANTURA, Cape Kamenjak, Z - 69

Description: Modern Age shipwreck of a merchant ship

The remains of the sunken armed sailing ship from 17/18 century cover an area of 30x50 m, at a depth of 21-24 m approximately 200m east of Cape Kamenjak. On that surface, there are three iron cannons with the pedestals, smaller iron anchor and scattered glass beads as part of the load. Beneath the sand there are remains of wooden construction of the ship which was long between 18 and 22 m.

- PREMANTURA, southwest of the lighthouse Porer and the Premantura, Z - 24

Description: Modern Age shipwreck, wreck of Austro-Hungarian torpedo boat “Flamingo”.

The wreck of the Austro-Hungarian torpedo boat “Flamingo” is located about 2 NM SW of the lighthouse Porer. This is the only preserved example of the first generation of torpedo boats class “Sperber”. It was launched in 1885 in Pula and sank 08/23/1914

after hitting a mine. It was armed with two torpedoes. The vessel was 40 m long, 4.8 m wide, with a draft of 2m.

- PREMANTURA, near the lighthouse Albanež, Z - 31

Description: Modern Age shipwreck of merchant sailing ship

The remains of a sunken merchant sailing ship from 17/18 century are located approximately 50 m east of the lighthouse Albanež. They cover an area of 100x50 m, at a depth of 24-27 m. On the surface there are documented three iron cannons of 2-3m length, and two anchors of admiralty type. Beneath the sand remains of the wooden structure of the ship are found.

### 1.3. CITY OF NOVIGRAD

- NOVIGRAD, west of Novigrad, Z - 20

Description: Modern Age shipwreck, wreck of a warship "Coriolanus"

The wreck of the British minesweeper "Coriolanus" class Sheakespearean is located 6 NM west of Novi city at a depth of 20-32 m. The ship is 50 meters long, and has a well-preserved bow, bridge, stern and weapons on board. The ship sank in 1945 when it hit a mine.

- NOVIGRAD, bay of Karpinjan and Sv. Anton, Z - 68

Description: remains of ancient settlements and the dock

Within the bay of Karpinjan and the Sv. Anton, which is located north of the historic center the city of Novigrad, is determined the position of series of coastal and riparian mainly ancient objects among which two villae rusticae, and the remains of the port docks stand out.

### 1.4. CITY OF ROVINJ

- ROVINJ, area of Sv. Ivan in the open sea, Z - 98

Description: Modern Age shipwreck, wreck of Austro-Hungarian ship "Baron Gautsch"

The wreck of a sunken passenger steamer "Baron Gautsch" is at 6 NM SW of the lighthouse Sv. Ivan. The Austro-Hungarian passenger ship sank at the beginning of the 1st World War when passed over a mine. It was one of the most modern ships of its time with a series of technical innovations. Inside the ship there is still part of the ship's equipment and tableware.

- ROVINJ, south of Rovinj and the west of Brijuni, Z – 23

Description: Modern Age shipwreck, wreck of a merchant ship "Hans Schmidt"

The wreck of a sunken merchant ship "Hans Schmidt" is located in the open sea, south of Rovinj, west of Brijuni. It is a commercial steamer built in 1920 under the name "Albireo", a new name was given by the owner from Flensburg. In the 2nd World War

it was used for military purposes, but sank in 1943 after hitting a mine. It is long 112 m and 15 m wide.

### **1.5. CITY OF UMAG**

- SIPAR, along Cape Kaštel and the wider area of the bay Zambratija, Z - 72

Description: remains of ancient settlements and the dock

On the cape/peninsula there are the ruins of the ancient settlement Siparis. The remains of various buildings and of the ancient sewer are found. In the coastal area of the cape/peninsula there are remains of a pier on the north side, and larger pool of with an embankment on the south side (Bay Kaštel). In the vicinity, fragments of pottery from the same period are found, indicating a rich cultural class.

- SEGET, Kocišće bay near the Cape Sv. Ivan, Z - 71

Description: remains of ancient settlements and the dock

In the Kocišće bay near the Cape Sv. Ivan, south of Umag, under the sea traces of two piers built of rough-cut stone blocks are spotted. In the bay, there are identified remains of an ancient villa rustica. Cultural layer rich in archaeological findings goes all the way to the Cape Sv. Ivan. Immediate area of the site covers an area 100x100 m. According to the findings it dates to the transition of the 1st to 2nd century.

- SAVUDRIJA, Old Savudrija bay, Z – 70

Description: the remains of the ancient port

The remains of the ancient settlement Silbio are visible in several places in the coastal edge along the Old Savudrija bay. Ancient port was closed with two piers, and other remains of the ancient coast in the bay are also found. The northern part is explored and presented as part of our coast, and the southern part with the rest of the ancient pier is under water. The whole bottom of the bay has a rich cultural layer with findings from antiquity to modern times.

### **1.6. MUNICIPALITY OF VRSAR**

- VRSAR, Vrsar, Z - 97

Description: wreck of the plane, American bomber B-24H Liberator

It is located about 1 nm southwest of the port of Vrsar in Istria, at a depth of 28-30 m. It is the US heavy bomber B-24 H (or J), which was demolished in 1944, probably by the German air defense. At the bottom, there are visible parts of the fuselage, wings, engines, tail turret with machine guns, while the propellers have already been removed. Nearby the wreck there are numerous smaller remains - the accessories and the plane structure.

## 2. PRIMORJE-GORSKI KOTAR COUNTY

### 2.1. CITY OF CRES

- PERNAT, so called Pernat II, near Cape Debeli, Z – 37

Description: ancient shipwreck.

The underwater archaeological site near the Cape Pernat on Cres was explored in 1973. This is an ancient shipwreck, with the type of amphoras dated in the middle of the 2nd century. The site has been repeatedly looted and only part of the ship and the ship's cargo remained buried in mud and sand.

- MARTINŠČICA, near Cape Kijac, Z – 14 (RRI-0310)

Description: ancient shipwreck.

The underwater archaeological site near the Cape Kijac in the bay Martinščica is located at a depth of 25 meters below the cottage of tuna hunters. The area which occupies this site is approximately 150 m<sup>2</sup>. This corresponds to the coverage of the sinking area and the scattered amphoras. Amphoras are typologically different, and they may be dated back to the 1st century. The finding site has not been explored yet.

- PERNAT, Cape Pernat, RRI-0306

Description: Modern Age shipwreck.

This underwater archaeological site is located near the Cape Pernat, 57 meters from the coast, opposite of the source of water, at a depth of 25 m. The site has not been explored yet; only the surface was inspected. It is assumed that it spreads over an area of about 30 square meters, but the remains of the cargo and eventually the ship are covered with sand, something that requires research for the detailed surface coverage. In the process of the terrain overview, several types of pots were pulled out with very coarse texture, probably intended for local use. It is about home ceramics used for a long period, but roughly can be dating back to 15th and 16th century.

### 2.2. CITY OF MALI LOŠINJ

- OSOR, Bijar bay, Z – 77

Description: the remains of the ancient port and anchorage

Bijar bay was a port and anchorage of the ancient city of Apsorus. In some places, large rocks on the shore can be seen, covered in marks from the many years of tying the ship's ropes. In the bay, at a depth of 3-5 meters, 10 meters from the coast and below the city walls, a large concentration of ancient pottery and tegulas was discovered. It seems like a landfill site created during the long period of antiquity.

- UNIJE, northwest of the islet of Školjić, Z – 36

Description: ancient shipwreck

Underwater archaeological finding site Školjić near Unije is located on the south side of the islet of the same name, at a depth of 37 meters. These are two concentrations of fragments and whole amphoras, 15 meters apart from each other. The total area of the site is 150 m<sup>2</sup>. Amphoras are typologically dating from the 1st century.

- SUSAK, near Cape Margarina, Z – 22, N = 44° 29' 45'', E = 14° 18' 38''

Description: ancient shipwreck

It is the underwater archeological finding site of the wreck of the ship that was transporting building materials. There, tegulas, stone columns and imbrexes were found. The wreck's remains are scattered from 18 to 28 meters depth. It was explored back in the Seventies.

- ILOVIK, near the island of Sv. Petar, at the west point of the island Ilovik, Z – 47

Description: ancient shipwreck

On a sandy slope, at a depth of 27 meters the existence of 200 amphoras was found. The entire site was explored in the period from 1978 to 1980. Based on the type of amphoras found (e.g. Forlimpopoli), it's dated to the 2nd century BC.

- MALI LOŠINJ, near Cape Boko, Z – 48

Description: ancient shipwreck

Near the Cape Boko, about 30 meters from the shore at a depth of 22-25 meters there are the remains of an ancient shipwreck. These are considered the only remains of the cargo: amphoras, fragments of pottery and tegulas which are all petrified. The site extends to a length of almost a hundred meters.

- MALI LOŠINJ, Radiboj bay, RRI-0309

Description: ancient shipwreck

The remains of an ancient shipwreck found in the Radiboj bay at a depth of 15 meters. On the entire move from the land to the middle of the bay there are scattered fragments of amphoras with the highest density of findings at the maximum depth, probably the place where the ship sank. According to the cargo of amphoras, the shipwreck dates to the 1st century AD.

- UNIJE, near Unije by the rock Školjić, Z – 50

Description: Modern Age shipwreck, wreck of a steamboat "Tihany"

Along the west side of the Školjić rock, in front of the port of Unije, at a depth of 30-38 meters there are the remains of a sunken Austro-Hungarian steamer Tihany. The steamer was owned by the company "Ungaro-Croata", and had a load capacity of 204 BRT, 45 mt long and 6 mt wide. The ship sank in 1917 after running aground.

Steamboat Tihany is a typical example of a coastal cargo steamer from the early 20th century.

- MALI LOŠINJ, near Cape Madona in front of the position Pločice, Z – 49

Description: ancient shipwreck

The underwater archaeological site is located near the port Čikat, 220 meters southeast of the lighthouse on Cape Madona, and 80 meters off the coast in the direction of the Veli žal bay. It lies at a depth of 18 meters. Only tegulas were found there, thus it can be concluded that the ship was transporting building materials.

### **2.3. CITY OF NOVI VINODOLSKI**

- NOVI VINODOLSKI, in the channel between Krk and Novi Vinodolski, Z – 15

Description: Modern Age shipwreck, wreck of a German warship TA 45 (SPICA)

In the channel between Krk and the mainland, near Novi Vinodolski there is a wreck of the sunken torpedo boat TA 45. It is about warship originally called “Spica” which belonged to the Italian Navy as a light cruiser in the 1st World War, and is further refurbished before the 2nd World War. After the fall of Italy, it was taken over by the German navy, equipped with radar system and incorporated in system of the 11th Division of Insurance in 1944/45. It was sunk by British torpedo boats in April 1945. Today, the wreck is at a depth of 51-60 meters. The special value of the wreck lies on the ship’s weapons: two torpedoes, guns of 100mm, 40mm and 20 mm.

### **2.4. CITY OF RAB**

- RAB, Barbat, Cape Glavina, RRI-0282

Description: ancient shipwreck

In the waters of the Cape Glavina, at a depth of 17-23 m, on the sand, people came across the remains of an ancient shipwreck. The site was explored, and the remains of the wooden structure of the ship and amphoras type Dressel I were found, which are all dated from the 1st century BC to the 1st century AD. The majority of amphoras under the research were taken out.

### **2.5. MUNICIPALITY OF BAŠKA, KRK**

- Baška, Cape Dubno, RRI-0384

Description: ancient shipwreck

The finding site of amphoras near Cape Dubno next to Baška on the island of Krk is located at a depth of 15-20 m, and it represents a cargo of smaller vessel that sank along the inaccessible coast. The ship was driving the load of wine or oil probably on the route Krk-Baška. The researches at the site were conducted in 1963 and 1975. According to the type of amphoras found, the ship is dated back to the 1st century BC or the 1st century AD.

## 2.6. MUNICIPALITY OF PUNAT

- Stara Baška, islet of Galun, RRI-0364

Description: ancient shipwreck

Next to the islet of Galun remains of an ancient shipwreck were found. The site has been repeatedly explored. It dates to the 1st century BC.

## 3. LIKA-SENJ COUNTY

### 3.1. CITY OF PAG

- ISLAND OF PAG, NOVALJA, Mala Vlačka bay, Z-6433

Description: ancient shipwreck

Along the northern cape of Vlačka mala bay on the island of Pag, at a depth of 24-30 meters, well preserved remains of sunken merchant ship was found with a cargo of Roman Republican wine amphoras type Lamboglia 2, which were dated to the 1st century BC. This is a group of about a hundred whole or partially damaged amphoras tightly interconnected and overgrown and covered with marine plants. Among amphoras there is a lower part of the ship's grindstone. Several amphoras are few meters away north of the main concentrations of the findings. In the southwestern part of the site, two bars of ancient lead anchors and four ceramic pots were identified. Probably under the sand there are more findings of cargo and equipment, and perhaps the remains of a wooden ship construction. This underwater site, after reambulation and research, has been protected with an iron cage of 12x10x2 meters and presented *in situ*. The underwater archeological site in the Vlačka mala bay on the island of Pag is considered one of the most important underwater sites of its kind in the Adriatic, because of its excellent condition, preservation and presentation, along with the rich findings identified there.

- ISLAND OF PAG, NOVALJA, Z-4205

Description: Modern Age shipwreck, wreck of the steamboat "Albanien"

The wreck of the Austro-Hungarian steamship "Albanien" is located southwest of the bay Jakišnica on the peninsula Lun on the island of Pag, at a depth of about 72 meters. The ship was sunk in 1916 by two torpedoes from the Italian submarines while transporting military material. It is a commercial - passenger steamer that was built in 1910 in "Stablimento Tecnico Triestino" in Trieste, for the Austrian Lloyd. With length of 66 meters and width of 10 meters, with two masts, it was able to reach a speed of 12 knots and transport 44 passengers. Today, the wreck is located on a flat sandy seabed, on its keel, and is in one piece.

- ISLAND OF PAG, NOVALJA, Z-4204

Description: Modern Age shipwreck, wreck of the steamboat "Euterpe"

The wreck of the Austro-Hungarian steamship Euterpe is located south of the bay Potočnica on the peninsula Lun on the island of Pag, at a depth of about 79 meters. The ship was manufactured in 1886 was owned by the Austrian Lloyd, and sunk in 1918 by two torpedoes from the Italian submarine F7. During its sinking, over 560 people died and that's why this is considered the greatest maritime tragedy in the eastern Adriatic. The ship was carrying Austrian troops from Rijeka to the Bay of Kotor. Today the wreck is located on a sandy bottom in the navigation line. According to the existing data, part of the bow was destroyed by explosions while the stern is well preserved.

### **3.2. CITY OF KARLOBAG**

- KARLOBAG, Baška Draga bay, RRI 380-1975

Description: the remains of the ancient port and anchorage

Baška Draga bay under Vidovgrad served the Romans as a port, and this justifies findings of throats, fragments of amphoras and amphora corks on the site of Baška Draga, and also approximately 500m southeast along the coast at a depth of 7-25m. This is one of the most famous sites of amphora corks, some of which have printed signs.

## **4. ZADAR COUNTY**

### **4.1. CITY OF BIOGRAD NA MORU**

- BIOGRAD NA MORU, along the northwestern side of the islet of Oštarije (Kumentić), Z – 30

Description: the remains of the ancient port

The islet of Oštarije/Kumentić in front of Crvena luka near Biograd, in ancient times was connected to the mainland and was located on the southern part of the wider complex of antique rustic villa on the position Kumenat, as its occasional port. The remains of the port are located on the northwest side of the islet, at a depth of one meter, built in an L shape, length 28 and a width of 10 meters. Around the port fragments of ancient ceramics are found, and there are also findings in layers of sand around subsea construction.

- BIOGRAD NA MORU, Bošana bay, Z – 28

Description: the remains of the ancient port and the dock

At a depth of 1.5 to 3 meters, as a continuation of the Roman walls to the coast, there are remains of Roman docking embankment. East embankment was built of broken stone, with a head in the form of spike, and around it there are fragments of tegulas, suspending posts, amphoras and pithos. West dock is built in an L shape, of large stone blocks, filled with broken stone. It stretches 160 meters into the sea, then it breaks at a right angle and continues in length for 45 meters. Around the harbor docking

embankment there are ship ballast stones and fragments of ancient ceramics. The site dates from the 1st to the 4th century.

- BIOGRAD NA MORU, position Kumenat between beaches Soline and Crvena Luka, Z – 32

Description: the remains of the ancient port and the dock

Dock of ancient building, villa or saltern, whose residues are on the coast, are located in the sea at a depth of 2-5 meters. Dock takes the form of a tongue with length of 76 and a width of 25 meters. It is oriented towards the southwest, built of large stone blocks and filled with broken stone. Around it a cultural layer was found with thickness of 30 to 40 cm. It is one of the largest operating docks in the central Adriatic whose origin dates back to the first century.

- SUKOŠAN, Vodotič bay (Barbir bay between the capes of Plitkače i Kažela), Z – 29

Description: the remains of the ancient port and the dock

In the Barbir bay between capes Plitkovače and Kažela, at a depth of 1 to 3.5 meters, there are remains of the complex dock installation belonging to the ancient rustic villa, whose remains have been preserved near the coast. Installation consists of the eastern structure that served as a main dock and western structure which served as a breakwater. The foundations are made of large stone blocks. Beside the architectural remnants the finding site is rich in pottery fragments. The remains of buildings were in full operation in the period of Late Antiquity.

- SV. FILIP I JAKOV, along the western side of the island Frmić in Pašman channel, Z – 44

Description: the remains of the ancient port and the dock

On the islet of Frmić are identified the remains of antique rustic villa, and on the west side of the islet there are the sunken remains of a smaller dock. Among the remains of the villa is an interesting 'piscina' with the barrel vault. Dock is in the form of the letter "L" and is located on the depth of 1-7 meters. It was built of the broken stones around which are scattered ballast stones, and there are also the remains of ancient ceramics. The villa with the dock dates to the period of Late Antiquity.

- TURANJ, position Tukljača and between the Cape Tukljača and the islet of Ričul, Z – 16

Description: the remains of ancient settlement and embankment from the prehistoric times and antiquity.

Between the islet of Ričul and the mainland at a depth of 1.5 to 3 m are stretching the remains of the embankment which connected the islet with the mainland. The embankment is made up of piled broken stones and was reinforced by wooden

construction. Along the embankment a rich cultured layer dominated by fragments of prehistoric pottery. Near the embankment, there are remains of an ancient villa and the breakwater with accompanying cultural layer.

- TURANJ, Z – 76

Description: remains of the ancient dock

Along the coast of the islet of Galešnjak and opposite to local cemetery on Tukljača are identified the remains of the ancient dock. Beside the remnants of docking embankment at a depth of 2 to 4 meters, special importance represents unexplored cultural layer with a high concentration of movable findings from the Roman period.

#### **4.2. CITY OF NIN**

- ZATON, Cape Kremenjača, Z – 733

Description: the remains of the ancient port

Near Cape Kremenjača, not far from the settlement of Zaton, there are the remains of the ancient port of Nin. From the cape into the sea, it stretches about 200 meters long and has a breakwater made of pile of rocks. The sea depth along the the breakwater ranges from 1,5 to 4 meters. By systematical archaeological researches on cultural layers, up to 1 meter thick, the remains of three Liburnian ship (Serilia) and of a significant amount of glass and pottery findings, and architectural elements were found. The largest economic rise of the port was during the 1st and 2nd century AD, while in the third century the intensity of trade in this port decreased.

#### **4.3. MUNICIPALITY OF PAKOŠTANE**

- PAKOŠTANE, on the southeast side of the islet of Gnalić, Z – 13

Description: Modern Age shipwreck

The remains of an armed merchant ship from the 16th century next to islet of Gnalić cover a wide area at a depth of 25-35 m. On the surface the remains of the cargo, particularly windows, bottles and glasses of Murano type glass, are visible. Although the shipwreck was partially explored, a part of the load is still under the sand, where also the ship's structure remains well-preserved.

- PAKOŠTANE, along the coast at the position Janice, Z – 35

Description: the remains of the ancient settlement and port

The remains of an ancient construction with a little port are located in Janice along Pakoštane. There are also the remains of the breakwater, which was constructed of large stone blocks. It extends to the islet of Sv. Justin, and on the west side, it's located in an operational port. The site lies at a depth of 1.2 to 2.2 meters, and probably it was an integral part of an ancient villa, whose ruins are located on the coast.

#### **4.4. MUNICIPALITY OF PAŠMAN**

- NEVIĐANE, position Mirište

Description: The remains of the ancient settlement and port

At the position Mirište, 800 meters away from Neviđane, at a depth of 3.5 meters are the remains of Roman buildings. This is an operational dock in the form of a wide and relatively short tongue, along the coast, width of 110 m and 90 m long, built of untreated stone. On the whole area fragments of Roman pottery are scattered. At the the same position and along the coast there are preserved remains of ancient buildings.

- NEVIĐANE, between the islet of Garmenjāk and the southeast coast of Pašman, Z – 74

Description: The remains of the ancient port

In the shallow isthmus between the islet of Garmenjāk and the island of Pašman, at the depth of 1.2 meters, the remains of the walls of large hewn stone blocks are located. Based on the ground plan, the remains of the port arrangement can be observed. Around the walls there are movable artefacts, pottery fragments and ballast stones. The finding site, in view of the Iron Age remains found on the island's hill, and could be dated in the pre-Roman period.

- NEVIĐANE, along Cape Sv. Mihovil, Z – 27

Description: The remains of the ancient port

By the Cape Sv. Mihovil near local cemetery of Neviđane on the island of Pašman, at the depth of 3.5 to 5 meters, the remains of the ancient dock are found. Its line moves vertically from the shore, and then takes semicircular turn towards the south. Northwest of the dock, the remains of the breakwater, of about 120 meters long and 4.5 meters wide, are preserved. The breakwater is made of large stone blocks. Around the dock, fragments of pottery can be found.

- KRAJ, at the southern end of the Polačine bay, Z – 38

Description: The remains of the ancient port and dock

At the southern end of the bay Polačine, not far from the place Kraj, at a depth of 2.5 meters the remains of a large ancient dock built of cut stone blocks are located. Top of the dock is 120 meters from the shore. Along the coast, the dock is 35 meters wide, and at the top is 6 meters wide. Around the dock is found rich culture layer which originates from 1st to 4th century AD.

- PAŠMAN, along the northwestern side of the islet of Muntan, Z – 26

Description: The remains of the ancient dock

Islands Muntan, Veliki and Mali Dužac were connected, in antiquity, with the coast of Pašman, closing in this way a deep bay. A little stone dock at the northwest of the island was the logical place for a boat mooring and resting place for the ancient ships. Archaeological remnants found on the seabed, in a thin layer of mud and sand, unveil information about the life in this port during the ancient times.

#### 4.5. CITY OF ZADAR

- PREMUDA, southwest of the island of Premuda, Z – 67

Description: Modern Age shipwreck, wreck of a warship “Szent Istvan”

The ship is 152 meters long and 28 meters wide, the crew counted 1,050 members. It is located at a depth of 45-66 meters, 8 nautical miles southwest of the island of Premuda. It sank in 1918, after it was hit by two torpedoes sent by Italian torpedo boats. On that occasion, 89 crew members died. In the wreck, among various objects for everyday use, a large amount of ammunition of different calibers was found. Part of valuable objects from the ship is kept in the Historical Museum of Istria in Pula.

### 5. ŠIBENIK - KNIN COUNTY

#### 5.1. CITY OF ŠIBENIK

- KAKANJ, Kamešnjak Mali, Z – 238

Description: Ancient shipwreck

East of the islet of Kamešnjak Mali, not far from Kakanj, at a depth of 9-28 m, partly on the stone slope and partly at the sandy bottom, the remains of the shipwreck can be found. These include two larger groups of broken amphoras type Lambogia 2, as well as parts of the ship’s structure. The shipwreck is dated to the 1st century BC.

- KAKANJ, islet of Kamešnjak Veliki, Z – 240

Description: Ancient shipwreck

The remains of the shipwreck are located along the southern cape of the islet Kamešnjak Veliki near Kakanj, at a depth of 14-18 meters, both at the cliff’s slope and below it. It is the site of calcified amphoras of Greco-Italic type and of remains of a wooden ship’s structure. The shipwreck is dated to the period of 3rd-2nd century BC.

- KAPRIJE, Z – 243

Description: Modern Age shipwreck, shipwreck “Francesca da Rimini”

The sunken cargo ship from World War II “Francesca da Rimini” had 281 GRT carrying capacity and was transferring ammunition for the needs of the German Navy, when it was sunk in February 1944 at the island of Kapri by the British torpedo boats. The wreck is well preserved.

- KRAPANJ, Drvenik, Z – 234

Description: Modern Age shipwreck

West of the island of Drvenik near Krapanj, at about 50 meters from the shore, and at a depth of 25-40 m, a great iron anchor was found in the sand, along with five iron cannons and various other examples of ship cargo. Parts of ship's structure were also found. The shipwreck is dated to the period of 16th to 17th century.

- KRAPANJ, between islands of Oblik and Mala Krbela, Z – 239

Description: Ancient shipwreck

Between the island of Oblik and islet of Mala Krbela, about 1.5 NM southwest of the the island of Krapanj, at a depth of 18 meters, on the flat grass-covered bottom the remains of the shipwreck are located. The deposit was destroyed in 1920. It was a great deposit of amphoras of Greco-Italic type. The shipwreck is dated to the 2-1 century BC. Under the sand the remains of the ship's structure and of a smaller part of the load, are still well preserved.

- KRAPANJ, Cape Plavac Z – 242

Description: Ancient shipwreck

About 60 meters east of Cape Plavac, at a depth of 25-35 meters, at the stone slope and on the sandy plateau, the remains of the shipwreck are located. The deposit is partially explored. It was the cargo of eastern amphoras type Dressel 2-4 and Rhodes amphoras with eyelets at the handles. The shipwreck is dated to the 1st century AC. Under the sand the remains of the ship's structure, along with a smaller part of the load, are still well preserved.

- MUNA, along the northern coast of the island Žirje, between the bays of Muna and Koromačna, Z – 53

Description: Ancient shipwreck

Northwest of the Koromačna bay, there is a preserved ancient shipwreck with a cargo of amphoras. It is located on a rocky bottom at a depth of 38-44 meters. This is one of the best preserved ancient shipwrecks, with a high concentration of amphoras, from a cargo of 17 x 8 square meters. It is particularly significant because of the unique types of amphoras found there. These are the "Dressel 43" amphoras ("horn handled"), which originate from Crete and amphoras type "Riley ER1" whose parallels were found in Pompeii. During the documentation, around 300 amphoras were found. The site is fully documented and protected with a protective net.

- ŽIRJE, next to islet of Gušteranski, north of the settlement Žirje, Z – 52

Description: Ancient shipwreck

On the northwest side of the islet of Gušteranski the remains of the shipwreck are located. The finding site extends 20 meters in length and 10 meters in width. On the bottom, the remains of pottery and amphoras are scattered. Part of the cargo and the ship's structure still remain under the sand. Amphoras of type Keay XVI, Beltran 2B and Forlimpopoli as well as kitchen utensils of a southern Italic, Pompeii type were found. Based on these findings, the shipwreck is dated to the 1st century BC.

- ŠIBENIK, the channel of Sv. Ante, Cape Debeli, RST-0777

Description: Ancient anchorage

In the channel of Sv. Ante near Cape Debeli the remains of the anchorage, the stone blocks, fragments of amphoras, tegulas and the other ceramics were found, which are dated from the 2nd century BC to the 7th century AD.

## 5.2. MUNICIPALITY OF ROGOZNICA

- ROGOZNICA, Z – 241

Description: Ancient shipwreck

On the north slope of rocks Muljica, at a depth of 7-36 meters, partly on a steep cliff and partly on the sandy bottom, the remains of the shipwreck are located. Sounding revealed densely arranged amphoras type Lamboglia 2 with lids, and wooden remains of the ship's structure. Part of the ship's cargo is under the sand. The finding site is dated to the 1st century BC.

## 5.3. MUNICIPALITY OF TISNO

- MURTER, Z – 235

Description: The remains of an ancient settlement and port

On the western side of the Cape Gradina in the settlement of Murter, just behind the cemetery at a depth of up to 2 meters there are some architectural remains. There are visible big stone blocks roughly hewn, whereas closer to the coast one can see the walls made with smaller stones bound by mortar. Remains of pottery are also visible. The finding site is dated from the first century BC to the 1st century AD.

- MURTER, on the north side of the Cape Opat, Kornat island, south of Murter, Z – 236

Description: Modern Age shipwreck

In the unnamed bay on the north side of the Cape Opat at the island of Kornat at about 50 meters from the coast and at a depth of 8-42 meters, there are the identified remains of the shipwreck. At a depth of 25 meters, there is a cluster of bricks and tiles. Part of equipment of the ship is still under the sand, where there are also the remains

of the wooden ship's structure. Shipwreck generally dates from the 16th to 18th century.

- MURTER, Lavsa bay, island of Lavsa in the archipelago of Kornati, south of Murter, Z – 237

Description: The remains of an ancient settlement

In the bottom of the Lavsa bay of the island of Lavsa, at a depth of about 50 centimeters, there are the remains of walls built of properly stratified rocks with abundant mortar binder. Two to three rows of stone are preserved. Those are probably the remains of an ancient architecture.

- TISNO, near the islet of Kaselica, not far from the settlement of Vrulje, south of Kornati, Z – 51

Description: Ancient shipwreck

On the south side of the islet of Kaselica there are the remains of a shipwreck. The site extends about 50 meters in length and 20 meters in width, where the scattered remains of amphoras of type Lamboglia 2, are located. Based on the findings the shipwreck is considered to be dated back to 2-1 century BC. A part of the cargo and the remains of a wooden ship construction are buried in the sand.

- VRULJE, along the southern coast of the island Bisaga in the archipelago of Kornati, Z – 75

Description: Modern Age shipwreck

Along the southern coast of the island Bisaga in Kornati islands are located the remains of a sunken merchant ship from the 17th century. The ship was carrying cargo from Asia Minor, probably from Istanbul. In the sea, at a depth of 30 to 55 meters, one can clearly see ship cannons, anchors, ship construction and equipment parts, which cover a surface of about 500 sqm. Additionally, a large quantity of Chinese porcelain from the Ming Dynasty, pipe of Eastern provenance and metal cookware were also found.

- BETINA, Plitka Vala, Pačipolje, Z-5948

Description: Remains of ancient settlement and cemetery

In Betina, at the position Plitka Vala, the location is also known as Pačipolje and there are situated the remains of ancient building whose remnants are visible along the edge of the shore and in the sea. The remains of the tomb can also be seen in the sea. It used to be more of them in the past. According to the tales of local people they were built of tegulas set at two waters. Small findings are also mentioned. Indicative dating is the 1st century to the 6th century AD.

#### **5.4. CITY OF SKRADIN**

- SKRADIN, islet of Stipanac, Lake Prokljan, RST-0820

Description: The remains of the prehistoric and ancient settlement

In the coastal area of the islet Stipanac on Prokljan Lake a large quantity of Paleolithic flint pressings, and Iron Age pottery, fragments of Roman glass and ceramic pot were found.

- SKRADIN, islet of Stipanac – Cape Škoj, Lake Prokljan, RST-0819

Description: The remains of the ancient embankment

On the line islet Stipanac - Cape Školj on the land on Prokljan Lake, under the water there are some architectural remains. In fact, an embankment of 8 m average width, which in the past was used to connect the islet with the mainland, was found.

### **6. SPLIT-DALMATIA COUNTY**

#### **6.1. CITY OF HVAR**

- HVAR, near Cape Izmetište and near the island of Sv. Klement, Pakleni islands, Z – 45

Description: Ancient shipwreck

On northwest side of the Cape Izmetište near the island of Sv. Klement, in the archipelago of the Pakleni islands, on the sandy bottom, there are the remains of a shipwreck. On the seabed, the remains of ceramic pottery can be found scattered. The location was comprehensively researched. The pottery belongs to the ECW (Eastern Coarse Ware) ceramics, which means that the shipwreck dates to the 1st-2nd century BC. A smaller part of the load is still under the sand.

- HVAR, near islet of Gojca, Pakleni islands, Z – 46

Description: Ancient shipwreck

On the northwest of the islet, in the archipelago of the Pakleni islands near the islet Gojca, there are the remains of a shipwreck. On the surface the remains of broken amphoras can be found scattered, whereas buried in the sand complete amphoras can be found. The location has never been comprehensively studied. Amphoras belonging to the type Dressel 6a were identified, which means that the shipwreck is dated from the 1st century BC to the 1st century AD. A part of the cargo is still under the sand, and there are the remains of a wooden ship's construction.

- HVAR, Stari Stani bay near the island Sv. Klement, Pakleni islands, Z – 66

Description: Ancient shipwreck

On the south side of the island Sv. Klement, on the sandy bottom, there are the remains of the wreck of 2nd - 1st century BC. The site extends about 20 m in length and 10 m in width. Amphoras of type Lamboglia 2 were found. A smaller part of the

load of the ancient ship is still under the sand, as well as the well-preserved remains of a wooden ship's construction and amphoras.

- HVAR, near Petrov Bok bay, the settlement of Hvar, Z – 79

Description: Ancient shipwreck

Towards the southeastern cape Petrov Bok bay there are the remains of an ancient shipwreck. On the surface the remains of fragments of amphoras are scattered. In the sand, there are also whole amphoras. The site was explored and the part of the archaeological material is removed, but the location has not been fully explored. A part of the cargo is still under the sand, and there are well-preserved remains of a wooden ship's construction. Amphoras belonging to North African cylinder types (Keay XXV), and several versions of ribbed Late Antiquity oval amphora type Riley ER1. Shipwreck date the ship back to the 4th century.

- HVAR, near islet of Paržanj, Pakleni islands, Z – 81

Description: Ancient shipwreck

On the northwest side of the archipelago of Pakleni islands there are the remains of a shipwreck. On the surface the remains of broken amphoras are scattered, whereas in the sand complete amphoras can be found. The location has never been comprehensively studied. Amphoras belonging to the types of Hispanic amphoras (Dressel 2-4, 8, 10) were found, which means that the shipwreck is dated to the 1st century AD. A part of the cargo is still under the sand, and there are the remains of a wooden ship's construction.

- HVAR, Z – 229

Description: Ancient shipwreck

In a small bay, near the lighthouse, about 20 m at the transition from the stone to the sandy bottom, are the remains of a shipwreck. On the surface the remains of broken amphoras and remains of other ceramic pottery. Location has never been comprehensively studied. Typology of amphoras has not been determined. Ceramic pottery is of eastern Mediterranean origin. The shipwreck dates back to the 1st century AD. A part of the cargo is still under the sand, as well as the remains of a wooden ship's construction.

- HVAR, islet of Stambedro, Z – 230

Description: Modern Age shipwreck

On the northern side of the islet Stambedra, on a sandy bottom, the remains of a Modern Age shipwreck can be found. On the sand two iron anchors and three iron cannons can be seen. A part of the equipment of the ship is still under the sand, and

there are the remains of a wooden ship's construction. The shipwreck is dated from the 17th - 18th century.

- HVAR, VELO GRABLJE, in front of Pišćena bay, southeast of Velo Grablje, Z – 64

Description: Ancient shipwreck

On the northwest side of the archipelago Pakleni islands are the remains of a shipwreck. On the surface, the remains of broken amphoras are scattered and in the sand complete amphoras can be found. The location has never been comprehensively studied. Amphoras belong to the types of Hispanic amphoras (Dressel 2-4, 8, 10), which means that the shipwreck dates to the 1st century AD. A part of the cargo is still under the sand, and there are also the remains of a wooden ship's construction.

- HVAR, SUĆURAJ, Z-6527

Description: Wreck of the plane, American bomber B-24 Liberator

The remains of a sunken American airplane B-24 Liberator from World War II are located in the channel between Hvar and the Pelješac, 3 nautical miles west of Sućuraj, between the islands of Hvar and Pelješac. The remains were found by PIK Mornar divers from Split. It is determined that the airplane is a US bomber, type B-24 Liberator with following characteristics: length 20.5 m, wingspan 33.5 m, weight of 25.5 tons, with 4 engines.

- HVAR, SUĆURAJ, Ferna bay, Z-5156

Description: Ancient shipwreck

On the island of Hvar, in the Ferna bay, is situated a large amphora finding site, which is mentioned in the descriptions of routes through Dalmatia of A. Fortis. There are two types of amphoras. Most of the amphoras are type Lamboglia Form 4 (Beneit Republicaine I), whereas some of them are of a different type with shorter neck and handles and thicker pointed bottom. The second type belongs to the first variant of Lamboglia Form 2 and is a unique copy throughout the whole Adriatic. According to the amphoras, the finding site in Ferna bay is dated from the beginning of the 1st century BC.

- HVAR, SUĆURAJ, Z-5698

Description: Modern Age shipwreck, wreck of the steamboat "Dubrovnik"

In the Neretva Channel, between the islands of Hvar and the Pelješac peninsula are the remains of a wreck of the steamboat "Dubrovnik". It is a vessel built in 1892 in Scotland, which was in service of the Dubrovnik steamship navigation. During the World War I, more specifically 9th May 1916 the boat was sunk with two torpedoes by the French submarine Archimede. Eighteen passengers and crew members died.

The ship is seated on the seabed in an upright position, in good condition with an intact structure, superstructure and large part of inventory.

- HVAR, in front of the Lučišće bay, Z-5770

Description: Ancient shipwreck

In front of the Lučišće bay, east of the city of Hvar, are located the remains of an ancient shipwreck. The remains of a shipwreck are containing amphoras type Lamboglia 2, which can be dated to the 1st century BC.

- HVAR, in front of the Zračće bay, Z-5771

Description: Ancient shipwreck

In front of the Zračće bay, eastern of the city of Hvar, are located the remains of an ancient shipwreck. Both types of amphoras, and therefore the shipwreck itself can be dated to the period from 4th to 6th century AD.

- HVAR, islet of Sv. Klement, Pakleni islands, RST-0693

Description: Ancient shipwreck

On the small island of Sv. Klement, Baba, near Palmižana, on Pakleni islands near Hvar is situated an ancient sunken ship. In addition to the load of coarse pottery there are also very fine plates, baked well, with pink-red glaze with a stamp in the form of rosettes which maintains Hellenistic tradition. This group belongs to the so-called "*terra sigillata*", and probably is of Asia Minor production. This confirms the findings of the so-called "*pseudo terra sigillata*" of brown color, with quite bad glaze and a Greek stamp. The finding is dated to about the 1st century AD.

## 6.2. CITY OF STARIGRAD

- VRBOSKA, near Duboka bay, Z - 231

Description: Ancient shipwreck

Within the bay Duboka on the northern side of the island Hvar, the remains of a shipwreck lie on the sandy seabed. On the surface, one can see scattered the fragments of amphoras. In the sand whole amphoras are also found. The site was partially explored and most of the archaeological material found was removed. Part of the cargo is still under the sand, along with the well-preserved remains of the wooden ship's construction. The amphoras found are African, cylindrical, type Africana II (KeayIV-VI) and Keay XXV, with some characterised as several versions of ribbed Late Antiquity oval amphoras. The shipwreck is dated to the 4th century BC.

### 6.3. CITY OF KOMIŽA

- KOMIŽA, Saladinac bay, island of Biševo, Z – 3

Description: Modern Age shipwreck

The remains of the armed, merchant ship from the 17th century is located in front of the Saladinac bay on the island of Biševo. There, one can see two iron anchors, a small cannon, diverse small materials, rolls of copper sheets, copper wire coils, bells, windows, bottles, Murano glass, pottery, pieces of metal, wood and other similar findings. Under the sand are found part of the load and the remains of the wooden ship's construction.

- KOMIŽA, along the northern side of the islet Mali Barjak, Z – 18

Description: Modern Age shipwreck, wreck of the ship "Teti"

Along the northern side of the islet Mali Barjak, west of Komiža, there are the remains of a sunken cargo ship "Teti" which ran aground in 1930 due to an error in navigation. It was built as a steamship in 1883 in the United States. The wreck is 72 meters long.

- KOMIŽA, along the north side of the Cape Stupišće, Z – 80

Description: Modern Age shipwreck, wreck of a merchant ship "Vassilios"

The wreck of the Greek merchant ship is located near Komiža. The length of the wreck is 100 meters and its width 15 meters. The ship lies on its left side. It had a capacity of 3673 GRT. It was produced in Osaka, Japan in 1920 and originally was named "Eastern Temple". The ship sank in 1939 after hitting the coast. Large cargo space, driveline and superstructure are well preserved.

- KOMIŽA, on the south side of the island of Svetac, Z - 78

Description: Ancient shipwreck

Fragments of amphoras types "Dressel 2-4" and "Richborough 527" from 1st century are scattered on the sandy bottom near the island of Svetac. Under the sand there are the remains of the cargo and equipment, as well as the remains of a wooden ship's construction.

- KOMIŽA, Z-2186

Description: Modern Age shipwreck, wreck of the ship "Re d`Italia"

During the Italian - Austrian conflict, in July 1866 (Viška bitka) Austrian ship Ferdinand Max hit with its bow the Italian ship Re d`Italia and left it sank near Vis. Re d`Italia was the armored frigate commissioned in the United States (New York), constructed in the shipyard Webb from 1861 to 1863. It was a wooden boat, longitudinally armored with plates made of cast iron (length 84.3 m, height 16.6 m, draft 6.7 m). It was designed as a "twin" of the ship "Re de Portugal". Shielded frigate Re d`Italia was one of the

most modern ships, which together with the destroyer “Affonditore”, was part of the newly built, modern Italian fleet.

- KOMIŽA, Z-6503

Description: Modern Age shipwreck, wreck of the ship “Radetzky”

Austro frigate “Radetzky” was built in 1854, in the shipyard Notham, United Kingdom. The boat’s length is 58.5 m and had a width of 12.5 m apart of the sails. It had a propeller powered by a steam engine of 300 horsepower, and it was armed with 41 cannons of various calibers. It participated in the Battle of Helgoland 1864, and in the famous battle of Vis 1866, after which it participated in missions in the Levant and the Adriatic. The ship sank on the 20th February 1869, after an explosion in the warehouse full of gunpowder and grenades. From the 355 crew members (mostly young men from Dalmatia), only 23 members survived, who were rescued by fishermen.

- KOMIŽA, Z-6801

Description: Modern Age shipwreck, wreck of the ship “Palestro”

In the naval battle between the Italian and Austro-Hungarian fleet near Vis in 1866 the Italian ships Palestro and Re D' Italia sank, and a large number of smaller vessels was damaged. Palestro is one of the best examples of war “battleship” of mid-19th century. It shows all the technical characteristics of the new types of naval ships of that period, as a result of the transformation of the Navies after Napoleonic wars, which relate primarily to the introduction of the steam engine and armor.

- KOMIŽA, Labotovo bay, Z -6814

Description: Modern Age shipwreck

The remains of the wreck found in 2014 and 2015 are located on the south side of the Cape Stupišće in Labotovo bay at a depth of 25 to 50 meters. The ship was carrying cargo which consisted of loads of iron anchors – of a minimum of 13 pieces. At the site was found a great number of whole or partially preserved ceramic bowls. After processing seven bowls are proved to be produced in the first half of the 15th century in the region of Veneto, which indicates the likely Venetian origin of the wreck.

- PALAGRUŽA, at the Baba rock south of Mala Palagruža, Z - 232

Description: Ancient shipwreck

Near Baba rock south of Mala Palagruža, on the stone slope and sandy bottom are the remains of a shipwreck. On the surface only debris can be found. It had a cargo of amphoras of indeterminate type and a great number of dolia. At the edge of the cliff an iron anchor is found. The shipwreck dates to the 1st century AD. Under the sand there are still remains of the ship’s structure, with part of the load.

- PALAGRUŽA, near the island of Galijula near cliff Pupak, Z - 233

Description: Ancient shipwreck

Not far from the cliff Pupak near the islet of Galijula, on the stone slope and the sandy bottom are the remains of a shipwreck. On the surface debris can only be found. It has a load of pottery of the South Italian type, mortarium and Hispanic amphoras type Dressel 2-4, Richborough 527, Dressel 38 and Haltern 70. The shipwreck dates to 1st century AD. Under the sand there are still the remains of the ship's structure with part of the load.

- PALAGRUŽA, islet of Galijula, RST-1415, 17/5-95

Description: Ancient and Modern Age shipwrecks

Islet of Galijula is located about 6 km east of Palagruža and represents the southernmost point of Croatian territory. In the sea around Galijula are three submarine archaeological finding sites. At one of them a ceramic ship altar from 4th-3rd century BC was extracted. At the other site, an amphora type Dressel 1C was discovered, while at the third site, two bronze cannons from the 16th century were taken out, which are now exposed on the shore in front of the Komuna in Komiža.

#### 6.4. CITY OF VIS

- VIS, along the northwestern coast of the islet Host, Z - 2

Description: Ancient shipwreck

At the entrance of the Vis harbour, the presence of the islet of Host was considered a major obstacle to the ships that sought shelter in bad weather conditions. For this reason, we can find here at least two archaeological sites. It's important to mention that a large number of fragments of amphoras of an extremely rare type "Dressel 35-36", were found near the islet of Host in Vis bay.

- VIS, along the north coast of the islet of Host, Z - 1

Description: Ancient shipwreck

A scattered pile of fragments of amphoras type "Lamboglia 2" covers a large area of the seabed near the islet of Host, north of the settlement of Vis. It dates back to the 2nd -1st century BC. Part of the cargo and the remains of the wooden ship's construction are buried under the sand.

- VIS, near islet of Greben, Z - 4

Description: Modern Age shipwreck

The remains of a small warship from the 18th-19th century are covering an area of approximately 15 x 30 sqm at a depth of 48-56 m near the islet of Greben, southeast of the island of Vis. On the surface iron anchors, cannons, and numerous tiny materials of pottery, pieces of metal, wood and other similar objects are found. Under the sand

there is a part of the equipment of the ship, as well as some wooden remains of the ship.

- VIS, by the cliff Krava, Z - 61

Description: Ancient shipwreck

A dispersed pile of fragments of early “Greco-Italic” amphoras and Corinthian B amphoras from 4th-3rd century BC is located on the northwest side of the cliff Krava, northeast of Vis. Stone grindstones made in at least two forms, are also observed. Part of the cargo and the wooden remains of the ship’s structure can also be found under the sand.

- VIS, Vela Svitnja bay, Z – 5

Description: Ancient shipwreck

The remains of an ancient shipwreck were found in the Vela Svitnja bay, north of the city of Vis. The site was fully explored and more than 600 amphoras had been taken out. A small part of the cargo, marine equipment and parts of the wooden structure of the ship are still under the sand. Amphoras belonging to type “Lamboglia 2” from 1st - 2nd century BC were also found.

- VIS, RUKAVAC, near Cape Polivalo, southeast of the settlement of Rukavac, Z - 17

Description: Wreck of the plane, American bomber B-17G

The sunken plane bomber is the best-preserved example of aircraft in the Adriatic waters. It is the American aircraft - bomber type “B-17G”, with the serial number 44-6630. It was a member of 340 Bmb Squadron, based in Italy, where it was taking off on missions of bombing targets in Austria. The plane was long 22.5 meters, with a wingspan of 31.5 meters. Armament consisted of machine guns Browning 12.7 mm and 7,893 kg bombs. During its mission on November 6th, 1944 the plane was damaged and was forced into an emergency landing. As the runway on the island of Vis was blocked, it landed to the sea and then sank. Today the plane is almost completely preserved with a complete set of instruments.

- VIS, RUKAVAC, on the south side of the islet of Ravnik, Z - 73

Description: Modern Age shipwreck, wreck of the passenger-cargo ship “Brioni”

Steamboat “Brioni” was built in 1909 as a passenger-trading vessel. It belonged to the company Österreichische Lloyd. During the World War I it was sailing in the service of the Austro-Hungarian Navy. It was long 69 meters and had 1111 BRT. The wreck lies on its left side on the seabed and is well preserved.

- VIS, port of Vis from the Cape Kampa to the Grandovac bay, Z - 65

Description: The remains of the Greco - Roman port

Within the port of Vis, around the peninsula of Prirovo are located the remains of the Greco-Roman port. The oldest port on the Adriatic Sea, from the 4th century BC, is well preserved, and was built of large cut stone blocks which are flanking the ancient coastline. Also, under the mud, there are numerous other archaeological findings. The bay was a port and anchorage in the 4th century BC, so the bottom is rich in findings from a broad period of time. Among the findings, which are observed throughout the bay, the most often are complete and damaged amphoras and pottery. In the bay of Sv. Juraj a dispersed group of ancient tegulas is observed.

- VIS, east of Cape Stončica, Z - 62

Description: Modern Age shipwreck, wreck of tugboat "Ursus"

East of Cape Stončica are the remains of the Italian tugboat "Ursus", one of the best preserved small boats in the waters of the Adriatic. It was built in 1918 in Venice. It was 35 meters long and 5 meters wide. It had 407 BRT capacity. At the beginning of the war it was mobilized by the Italian navy, and in 1941 sunk by the British submarine. The letters on the stern, the engine room, the chimney and the bridge are considered exceptionally well-preserved.

- VIS, Z-6743

Description: Wreck of the plane, the American plane B-24 Liberator, Tulsamerican

The remains of a sunken American airplane B-24 Liberator-Tulsamerican from World War II can be found at the island of Vis. The front of the airplane wreckage is located on a sandy plateau at a depth of 41 m, while the tail is located at a depth of 55 meters. The plane, during the emergency landing, crashed into the sea and broke into several large pieces. Upon the impact, the plane rolled over and now it lies on the seabed with the upper part of the fuselage on the sand. A visitor can observe the central part of the fuselage, its two wings, its four engines (one with preserved propeller), the base, the front of the turret, and the cockpit of the airplane, that is separated from the fuselage. In the cockpit all the instruments are well preserved. Under the cockpit there is a preserved canvas parachute. A multitude of ammunition is discovered, but no bombs were found. Due to the serial number of the chassis of the plane, it was confirmed that this was the B-24 Liberator called Tulsamerican. It is the last produced plane in the factory in the city of Tulsa in the United States.

- VIS, Vis bay, Z-6815

Description: Modern Age shipwreck

At a position near the passage between the islet of Host and the cape with Sv. Juraj fort, at a depth of 50 meters on a flat sandy bottom, the remains of a shipwreck were

discovered. On the surface layer of the bottom, eight iron cannons, one bronze cannon, cannon balls and a large number of other findings that belong to the ship's equipment were found. The findings are visible on the bottom and are scattered on the surface covering an approximate surface of 20 x 8 square meters. Their position at the bottom indicates that the ship, probably laid to the bottom with the keel down, after the sinking. Its *in situ* condition, unambiguously confirms that it is an intact finding of the Modern Age Venetian shipwreck and has no damage. Also, because of its location within the bay of Vis this wreck is not damaged by fishing tools. It is assumed that the lower part of the ship with all its findings, is completely preserved under the sand. The indicative dating of the wreck is from the 13th century to the 17th century.

- VIS, Z-5101

Description: Ancient shipwreck

The remains of an ancient shipwreck with a cargo of amphoras are found on the seabed at a depth of 25-50 m. According to the amphoras type Lamboglia II the entire site dates to the 1st century BC.

## 6.5. CITY OF KAŠTELA

- KAŠTEL SUĆURAC, Z - 732

Description: Ancient shipwreck

In the seabed of Bay of Kaštela at the position Trstenik in Kastel Sućurac an entire dolium, two large groups of amphoras and the remains of the wooden structure of an unknown 50-meter-long wreck were found. All the findings are visible at the surface layer. Since these findings are in a small depth (1-2.5 m) the groups of amphoras are protected by an iron net, and the dolium is extracted and stored in the Croatian Maritime Museum in Split. The wooden structure consists of longitudinally laid planks and circular, vertically mounted pylons.

## 6.6. MUNICIPALITY OF SUTIVAN, BRAČ

- SUTIVAN, on the island of Brač, Z-6502

Description: Ancient shipwreck

Not far away from Sutivan on the island of Brač at a depth between 31 and 34 meters are the remains of a shipwreck with sarcophagi and other stone objects that probably come from the local Brač stone quarries. At the bottom of the sea 20 objects, of which seven are sarcophagi, 2 are sarcophagus lids, 9 are blocks, 1 is a column of circular cross section and 1 is a stone trough with visible perforations. The site covers an area of 6.60 x 4.10 sqm (without the stone trough which is found 2 meters outside the concentration of cargo). Indicative dating of this finding site is in the Late Antiquity. It is assumed that, in the layer of the sand beneath and around the mentioned objects,

the remains of kitchen vessels, as well as the remains of the wooden ship's structure can be found, which could more accurately determine the time frame of this unique site in the Adriatic.

#### **6.7. MUNICIPALITY OF MILNA**

- MILNA, Lučica bay, on the island of Brač, Z-6816

Description: Modern Age shipwreck

On location near the Lučica bay on the southwest coast of the island of Brač are the remains of the submerged iron wreck of a steamship. Given the size of the site and the abundance of small ship materials, the site is considered an important source for the study of equipment of steamships from the 19th century. The steamship itself has characteristics important to the valuation and study of typological and structural elements of steamships in general.

#### **6.8. MUNICIPALITY OF ŠOLTA**

- ŠOLTA, Donje selo, Mlin shallows, RST-0675

Description: Ancient shipwreck

The underwater archaeological finding site is located in the Mlin, in the shallow western part of the Split Channel, which during Antiquity was a very important and frequent fairway. In the shallows the remains of an ancient shipwreck with a cargo of amphoras type Dressel 2-4 have been discovered, which chronologically set this wreck from the 2nd century AD.

#### **6.9. MUNICIPALITY OF BAŠKA VODA**

- BAŠKA VODA, present port, Z-6501

Description: Ancient port

The underwater archaeological finding site in Baška Voda is located in the port of Baška Voda itself, between the old pier for docking and eastern breakwater. In August 2002, at a depth of 4-5 meters, the fragments of ancient amphoras and other ceramic materials were found. Archaeological findings dated back to the period from the 2nd to the 6th century AD. The largest concentration of the archaeological remains is found in an area of about 20 m<sup>2</sup>. In September 2002 four more prehistoric stones, 20 cm long, were found. Also, the remains of the ship's wooden structure found there are considered a puzzle, since their purpose is still unknown. They are two parallel beams of 15 and 34 m, 40 cm wide. At a distance of about 50 meters northwest the remains of an ancient settlement in the locality known as Gradina were also located, so it is probable that in the past, there was a corresponding port in the underwater archaeological site. Based on this, the underwater archaeological site in Baška Voda is considered one of the few ports in the southern Adriatic with continuity of use from prehistory to Late Antiquity.

## **7. DUBROVNIK-NERETVA COUNTY**

### **7.1. MUNICIPALITY OF LASTOVO**

- UBLE, islet of Prežba, Cape Borova, Z - 84

Description: Ancient shipwreck

The site is located north of the settlement of Pasadur, on the northeastern part of the islet of Prežba, close to the cape which from the north side closes the Borova bay. It is about the site of dispersed remains of an ancient shipwreck, and the individual findings start at a depth of 9 m and extend on the slope of the seabed to a depth of 24 m. In the east - west, the site extends over a length of about 30 m. Based on the findings of amphoras of Greco-Italic type, the site dates back to the 3rd century BC. On the surface of the bottom no complete findings can be found, except some fragments and some parts of amphoras, bowls and other similar objects.

- LASTOVO, along the island of Saplun, Z - 33

Description: Ancient shipwreck

The remains of an ancient shipwreck are located within the archipelago of Lastovnjaci (Donji škoji), on the north side of the eastern cape of the islet of Saplun. It covers a surface of about 20 x 20 sqm. A hundred amphoras of type Lamboglia 2 are firmly attached, and have taken the form of the surrounding rock. The site dates to the 2nd century BC. Over its entire surface, a set safety net (cage) protects the area on several levels, since it follows the configuration of the terrain. The site was registered in 1987, and in 1988 the first researches started. On that occasion, the entire area of the site was cleaned and documented, and an extremely valuable finding of louterion: ceramic pedestalled pots, probably with function of the altar were found.

- UBLE, along the Cape Cuf near Uble, Z - 85

Description: Modern Age shipwreck

The site is located approximately 1 km west of the settlement Uble along the Cape Cuf. There the remains of a medieval or Modern Age shipwreck can be found. An iron cannon and some unspecified clusters of iron, stone and ceramics were found. In the documentation, the site is dated back to the 15th century, but this is not certain, because the new findings indicate a later date. By subsequent examination of the terrain the numerous fragments of pottery vessels found, the bronze bucket and the grindstone were taken out. In the bucket, a fragment of a smaller bronze vessel and part of a ceramic jug with partially preserved image of Dionysius were found.

- UBLE, along the island of Mrčara in front of the Punta Borak, Z - 59

Description: Ancient shipwreck

The finding site is located in the southeastern part of the island of Mrčara. It has the dispersed remains of an ancient shipwreck carrying amphoras, originating from the Greek island of Kos, so the site dates back to the 1st-2nd century AD. Most of the findings are calcified and firmly united with the seabed.

- LASTOVO, next to reef Drašan, Z - 96

Description: Ancient shipwreck

It is located on the north side of the island of Lastovo, next to reef Drašan. The remains of an ancient shipwreck spread down the eastern slope of the reef to the depth of 14 m, where the greatest concentration of fragments of amphoras have grown together with the rocky surface. Further continues a wall that goes to the depth of 30-33 m where the sand begins. At that depth, ten whole, or nearly whole amphoras were located. All the amphoras are of Greek - Italic type, so the shipwreck dates back to the 3rd - 2nd century BC.

- LASTOVO, along the islet of Lukovac, Z – 60

Description: Ancient shipwreck

A little more than half a mile northeast of Lastovo, there are three smaller islands – Lukovci. This finding site is located on the west side of the area, at a depth of 35-45 m, where the remains of an ancient shipwreck can be found. In the sand under the rock amphoras of type Lamboglia 2, were identified, whereas fifty meters further south a lead stock of an ancient anchor was found. The site dates back to the 1st century BC. The central part of the site was explored when most of the complete findings were taken out.

- LASTOVO, along the Cape Novi Hum, Z - 58

Description: Ancient shipwreck

The finding site is located on the north side of the island of Lastovo, one hundred meters west of the Cape Novi Hum. The remains of an ancient shipwreck date to the 3rd century BC and spread to an area of 10 x 10 sqm, with the highest concentration found at a depth of 10-11 m. On the surface, fragments of the Greek Italic amphoras were found, which have merged with the surface. In places of the highest concentration, the fragments of amphoras are stuck together in a natural wall, and only one throat is free.

- UBLE, in Presma bay of the island of Kopište, Z - 57

Description: Ancient shipwreck

The finding site is located west of Lastovo, on the west side of the island Kopište. The remains of an ancient shipwreck, along with fifty amphoras of type Dressel 6a, and several amphoras of type Dressel 2-3, are scattered across the sandy bottom. The site, according to the amphoras, dates to the 1st century BC. The site has not been explored yet, apart from the basic documentation. Partial devastations were observed in 1995.

- UBLE, in front of the Gornja Planika bay, Z - 54

Description: Ancient shipwreck

The finding site is located south of the settlement Ubli, in front of the Gornja Planika bay, near the cape that closes the east side of the bay, where the remains of an ancient shipwreck were found. A hundred amphoras of type Lamboglia 2 were firmly fused to each other and took the form of the surrounding rock. The site covered an area of about 10 x 13 sqm. In the sand under a rock, there are still a dozen amphoras and the lead stock of the ancient anchor. Under a layer of amphoras there are the remains of the ship. The site dates to the 2nd - 1st century BC. Because of the value and for the preservation of the site, a set safety net (cage), was placed there in 1990, which covers the entire surface of the wreck.

- UBLE, islet of Prežba, passage Mali Brod, Z-21

Description: Ancient shipwreck

The site is located on the northwest side of the islet of Prežba, on the position of "Prolaz Mali brod", where the dispersed remains of an ancient shipwreck can be found. According to the findings of Late Antique North African cylindrical amphoras and amphoras of Spatheion and Keay XXX types, the wreck is dated from the 4th to 6th century AD.

## **7.2. ISLAND OF KORČULA, MUNICIPALITY OF SMOKVICA**

- KORČULA, between Prižba and Brna, near islet of Otočac, Z-5656

Description: Modern Age shipwreck

The remains of a Modern Age shipwreck are located between the settlements of Brna and Prižba, north of the western edge of the islet of Otočac towards the land, about 1.5 mile east of Prižba. The first movable findings are visible at a depth of 11 m, and most of the ship's cargo, its construction and weaponry are at a depth of 20-27 m. The remains of glass windowpanes, reels of wire, chests with iron rods, drums, dispersed fragments of "yellow raw materials" and a large iron cannon, are found on the southern edge of the site. Indicative dating of the site is in the 2nd half of the 18th century. According to the analogies with other sites, it can be assumed that the load has been transported from the port of Venice to the Levant (Middle East).

### 7.3. ISLAND AND MUNICIPALITY OF MLJET

- KORITA, near islet of Veliki Školj, Z - 89

Description: Ancient shipwreck

On the north side of the cape of the island of Veli Školj, about 100 meters from the coast, on a small plateau in front of which rises a cliff high about 10 m, on the position under Školj, the remains of an ancient, and possibly of other wrecks, are found. On the surface several cases of sarcophagi with lids can be found, with more of them sticking out of the sand. Around the sarcophagi, fragments of pottery and broken amphoras as well as pottery belonging to the so-called "East Coarse Ware" group, have been identified. Amphoras are of type Dressel 6a, and based on them the entire shipwreck dates from the 1st century BC to the 1st century AD. Part of the cargo is still under the sand, as well as the remains of the construction of the wooden ship. The research of the site is in progress, and surely some new insights will be obtained.

- OKUKLJE, near the Cape Stoba, Z - 82

Description: Medieval shipwreck

In a small bay, approximately 500 m south of the Cape Stoba, and about 20 meters from the coast, the remains of a medieval shipwreck, are scattered across the rocky slope. In the cracks between the rocks, the encrusted ceramic fragments of Byzantine amphoras, of two pythos and of other vessels are found. The highest concentration of findings is between 18 and 20 m depth. A lot of broken pieces of glassware have been found. It can be assumed that the starting port of the ship was somewhere on the eastern Byzantine territory, and that the ship was sailing towards one of the northern Adriatic ports. The site dates to 9th - 10th century AD, and is the largest known finding site of Byzantine amphoras in the Adriatic.

- OKUKLJE, location Klačine, Z - 88

Description: Ancient shipwreck

The site is located approximately 1200 meters north of the settlement of Korita, west of the small reef, near the Cape Maharac at the position Klačine, on the north side of the island of Mljet, and at a depth of 29 - 34 m. There, the remains of an ancient shipwreck, over a hundred amphoras of type "Lamboglia 2" from the 1st century BC, as well as the remains of the ship's structure are buried under the sand. All the amphoras are firmly grown together with the surrounding soil and are covered with encrustation. Due to the high value and the preservation of the site, protective research and documentation were conducted, as well as the covering of the entire area with a protective net (cage) in 2001.

- OKUKLJE, near the Cape Maharac, northwest of Okuklje, Z - 91

Description: Ancient shipwreck

The remains of an ancient shipwreck are located northwest of the bay of Okuklje, and east of the Cape Maharac, next to a little reef, at a depth of 13 - 20 m. According to the cargo of amphoras Rhodes prototype (Camulodunum 184) and the so-called Eastern kitchenware, the shipwreck dates from the 1st century AD. The fragments of amphoras are also found in the cracks of rocks up to ten meters to the land, which probably came from those amphoras that floated and smashed to the ground, and then the wind and the waves have thrown them further to the land.

- OKUKLJE, Okuklje bay, between the Cape Stoba and the Cape Mrkijente, Z - 92

Description: Ancient shipwreck

The remains of an ancient shipwreck are found in the bay of Okuklje, between Cape Stoba and Cape Mrkijente, i.e., about 150 m north of the lighthouse. Underwater rock descends steeply down to 3 - 33 m depth, and it forms two terraces with retained material. At a depth of 4 m a large pile of encrusted fragments of amphoras of type Lambogia 2 are located, whereas on the deeper plateaus bigger fragments can be found. At the very bottom, on the sand, specimens of whole amphoras were also identified, whereas buried in the sand are the remains of the wooden structure of the ship. According to the findings, the entire shipwreck dates from the 2nd century to 1st century BC.

- POLAČE, Cape Glavat, Z – 227

Description: Ancient shipwreck

The site is located northeast of Pomena on Mljet, north-east of Cape Glavat, 50 m from the coast, where the remains of an ancient shipwreck, are partially explored and covered with protective net. The upper parts of the site were looted in 1970s. The individual findings of fragments of pottery vessels are visible from 5 m depth, and the denser concentration of materials is found between 33m and 50 m depth. Part of the cargo, the ship's equipment, and structure are still under the sand. There was found a large amount of southern Italy pottery, amphoras type Dressel 21 - 22, Richborough 527, Crete (Benghazi MR 2), egg-shaped with three handles, lumps of raw glass and similar. According to the findings, the shipwreck dates to the 1st century and early 2nd century AD.

- POLAČE, harbour of Polače, Z – 228

Description: The remains of the ancient port and dock

The large bay, due to its location and protection from the wind, certainly has favored the early settling and urbanization of Polače, as one of the most important meeting point of sea routes in the Adriatic. Researches were carried out in the wider waters of Polače. On almost the entire surface of the bay are located the remains of vessels (amphoras, plates, oil lamps), glass, numismatic findings (gold coin of Emperor Maurizio, 582 - 602 AD) and other objects that got into the sea during the stay of ships in ports or during transshipment. The remains of operational coast are found west and east of the ancient palace. Dominance in the quantity and quality of movable findings from 5th to 7th century speaks about the strongest intensity of life in that period.

- SOBRA, Sobra bay near the Cape of Pusti, Z – 90

Description: Ancient shipwreck

On the inner side of Cape Pusti, about 40 meters from the coast, at a depth of 30 - 38 m, are the remains of Late Antiquity shipwreck. The coast descends in the form of big cascades, and at the bottom of the largest cascade is located the finding site. The site was explored and the part of archeological material has been extracted. There were found several types of amphoras: North African cylinder (Africana II), globular amphoras with small circular tail, and amphoras type Keay XXII. Two iron anchors can be observed in the pile. Researches have shown “neatly” lined amphoras and the remains of the wooden ship’s construction. The size of the ship is about 20 to 25 m. According to the types of amphoras, the shipwreck dates to the 4th century AD.

- POMENA, Lastovska bay, RST – 785

Description: Ancient shipwreck

In the bay on the southwest side of the island of Mljet, facing the island of Lastovo from which it was named, are located the remains of an ancient shipwreck. Based on the load of amphoras of transitional type Lamboglia 2 in Dressel 6a, and Rhodes - Roman amphoras (Camulodunum 184) the wreck is dated back to the 1st century BC.

- POLAČE, south-west side of the island of Ovrata, RST – 783

Description: Ancient shipwreck and anchorage

On the southwest side of the islet of Ovrata there is a large number of anchors from different historical periods, that were constantly getting stuck in the crack of the stepped reef. The position is sheltered from the wind, and it could serve as a safe anchorage. The oldest specimens are lead stock of ancient anchors. Two stocks belong to a very rare type that are directly hafted on the wood, and do not have the characteristic box for anchor hafting. Two specimens of Roman iron anchors, and a large number of iron anchors with two or four arms, belonging to different periods from the early Middle Ages to the present day, were also found on the site. A total

number of 5 anchors was recorded, and also numerous fragments of pottery vessels, including amphoras type Lamboglia 2.

- POLAČE, south-west side of the island of Glavat, RST – 678, N = 42° 48' 17'',  
E = 17° 21' 44''

Description: Ancient shipwreck

The island of Glavat is located about 1.5 NM northeast of the bay and the settlement of Pomena on the Mljet. On the southwest side of the island, at a depth greater than 10 m, are located the fragments of pottery and the remains of building material (tegulas). Several anchors (lead stocks and one iron anchor) and one amphora are found at a depth of 32 m. It is the finding site of the dispersed remains of former shipwrecks. The site has never been systematically studied, and the data have been obtained on the basis of individual findings of divers and in the process of the terrain overview.

- SOBRA, Vela Dolina, Z – 5752

Description: Ancient shipwreck

The underwater archaeological finding site and the remains of an ancient shipwreck near Vela Dolina, is located on the north side of the island of Mljet, on a slant sandy bottom. On the surface of the sandy sea bottom, 27 Late Antiquity amphoras were revealed. Part of the amphoras belongs to the type of North African cylinder (Keay XXV / B), and part to the still undefined and unknown type of amphoras. Except amphoras, 4 iron anchors, 80 to 100 cm long, parts of the wooden structure of the ship and the lead hull, were found. Three iron anchors are stacked next to each other in the sand, as they were probably originally stacked to the ship.

- KORITA, Sv. Pavao shallows, Z-6178

Description: Modern Age shipwreck

The underwater archaeological site is located near the shallows of Sv. Pavao, west of the island of Preč, on the south side of the island of Mljet, at about 2.5 NM west of the bay of Saprunara. There lie the remains of a Modern Age merchant ship, along with a cargo of rich oriental goods for the western markets. At the site, the remains of the wooden ship's construction, its equipment and cargo were found. Among the ship's cargo, what particularly stands out are the numerous fragments of pottery vessels of the Turkish majolica, produced in Iznik workshops. Seven bronze and 1 iron cannon were also found, along with the ship's bell, bronze and silver coins and other findings. According to the cargo of the ship and the ship's bell with featured year the 1567, the finding site can be dated to the second half of the 16th century.

#### **7.4. MUNICIPALITY OF OREBIĆ**

- VIGANJ, Punta Sv. Ivan, RST – 662

Description: Ancient shipwreck

West of Viganj on the Pelješac peninsula, near Cape Sv. Ivan, on the location “Galija” or “Pod Galiju”, the remains of an ancient shipwreck with a cargo of kitchenware of Greek - Asian Minor origin (so-called Eastern kitchenware) can be found. A whole range of different forms - pots, small pots, bowls, lids, plates, jugs, pans, grills, brazier and other similar objects were identified. During 1971 and 1972, a part of the ship’s structure was explored. According to the findings, the site dates to the end of the 1st century and the first half of the 2nd century AD. The remains of shipwreck and cargo are oriented vertically to the coastline, covering an area of 30 x 15 sqm. The site is not fully explored.

## 7.5. MUNICIPALITY OF STON

- ŽULJANA, southeast of the lighthouse Lirica, Z – 25

Description: Modern Age shipwreck, wreck of a German torpedo boat “S – 57”

The remains of the German torpedo boat S-57 type “Schnellboot” from 2nd World War, are located about 3 NM southeast of the lighthouse Lirica, near Žuljana on Pelješac peninsula. It was one of the fastest ships of its time. The ship sank by British torpedo boats on 19th August 1944. The wreck lies at a depth of 25 - 38 m. The weapons are particularly well-preserved: 4 torpedoes and anti-aircraft cannon so-called “Flak”. During the previous periods, most of the mobile inventory of the ship and items of the ship’s crew, was removed and irreversibly taken away, with a small part of it found still inside the hull of the ship and in its immediate surroundings. One torpedo found on the left side of the ship was lifted to the surface, restored and is now firmly connected to the hull of the ship.

- STON, near Prapratno bay, Z – 19

Description: Ancient shipwreck

The remains of the Late Antiquity shipwreck are located in the southeastern cape of the bay of Prapratno, south of Ston, beneath the submarine cable hut, about 30 meters from the beach (along the cable). The bottom is sandy and gently falls to the depths. At a depth of 20 m, scattered on the surface, are the fragments of amphoras, whereas in the sand whole amphoras can be found. The location has not been explored. Part of the cargo is still under the sand, and there are the remains of the wooden ship’s construction. The amphoras are African, cylindrical, type Africana II (Keay IV - VI), and based on them the site dates back to the 4th - 5th century AD.

- ŽULJANA, islet of Lirica, Z – 5655

Description: Ancient shipwreck

The underwater archaeological site is located near the islet of Lirica, at the entrance to Žuljanska bay, 30 m north of the northeastern cape of the islet of Lirica. It is found on a slant sandy bottom, at a depth of 44 - 47 m. There, the remains of an ancient shipwreck, cover an area of about 9 x 10 sqm. Seven to eight partially or fully preserved amphoras, fragments of plates, pots (ship kitchenware) and a fragment of the tegula (perhaps a part of the covered deck of the ship) were identified. Also, an iron anchor, and the remains of the ship's structure like the ribs of the ship, the ship's outer plating, and treenails with which they were connected. According to the typological characteristics, the amphoras can be classified as type Dressel 6a amphora which are dated from the 1st century AD.

## **7.6. CITY OF DUBROVNIK**

- KOLOČEP, along the Cape Ratac on the north side of the island of Koločep, Z - 63

Description: Modern Age shipwreck

The site is located on the north side of the Cape Ratac in Donje Čelo, 50 meters from the peak of the cape, at a depth of 20 - 21 m, on a flat sandy bottom. There, the remains of an armed merchant ship from 17 – 18th century were found. On the surface 6 iron cannons, a pile of incrustated iron tools, and numerous small materials: windows, bottles and glasses of Murano glass, pottery and other similar objects were identified. Among the cargo one piece of ore was recorded, which was probably an arsenic sulfide compound that was used to produce colors for painting frescoes and paintings. Under the sand, a part of the cargo and the remains of the wooden ship's construction are located.

- ŠIPAN, Suđurađ, RST – 650

Description: Modern Age shipwreck

The site is located in the bay of Suđurađ, in front of at least three rocks at the entrance to the port, at a depth of 30 - 31 m. The remains of a late medieval ship and its cargo are one of the few that have been explored. According to the findings obtained in the archaeological and archival researches, it has been determined that it is a Dubrovnik ship, from the second half of the 16th century. The remains of the ship extend to the east - west, with the ship's bow towards west, at the bottom of the reef. Nearby are seen the remains of ballast stones, stone cannon balls, fragments of ceramic plates, copper utensils, wooden and metal parts of the structure of the ship, and the remains of the ship's cargo (iron rods stacked in bundles).

- BRSEČINE, Cape Gumanci, Z – 5756

Description: Modern Age shipwreck

At a depth of 35 m, a small pile of stones, one complete and five partially preserved bronze cannons were found. These cannons were extracted in the framework of research of the Croatian Conservation Institute, and then preserved and restored in the restoration workshop of the Dubrovnik Museums. By the cannons, two entire cannon balls and two halves were identified. The second part of the ship is located at about 12 meters south of the first part, at a depth of 41 - 42 m. There is a large pile of ballast stones (diameter of 3 m), one iron anchor (1.5 m long) and two iron cannons. By the anchor, other iron objects are located, which are still difficult to define. Under the ballast stones are the remains of the outer plating of the ship made of wood and the lead coating. The remains of plating continue westward about 10 m, and 12 m to the east. On this basis, it can be assumed that the total length of the ship was about 30 m, and the remains are spread in the east – west direction.

#### **7.7. MUNICIPALITY OF ŽUPA DUBROVAČKA**

- SREBRENO, port of Srebreno, Z-5710

Description: Ancient port

The remains of the ancient port and the associated operational coast are located in the bay of Srebreno. It is mostly of small and large fragments of amphoras, amphora covers, fragments of bowls, plates, cups and other ceramic materials. Among the movable material in particular, findings of amphoras type Dressel 1, dating from the 1st century BC and the 1st century AD can be sorted out, as well as fragments of Hellenistic pottery from the 2nd to 1st century BC. In a broader context, it is about the part of the outside city area of the colony of Epidaurum.

#### **7.8. MUNICIPALITY OF KONAVLE**

- CAVTAT, Velika shallows, Z - 56

Description: Ancient shipwreck

Within the protected underwater archaeological zone of Cavtat, among other things, there is one of the largest and best preserved ancient shipwrecks, with a cargo of amphoras, located in the east coast of the Adriatic. In the surface layer a large number of whole amphoras (North African cylindrical and “LR2” amphoras from the Aegean basin) were documented. According to the type of amphoras, the finding site dates to the 4th century AD. Because of its value, the site is covered with a protective cage.

- CAVTAT, near islet of Supetar, Z - 55

Description: Ancient shipwreck

Within the protected underwater archaeological zone of Cavtat, among other sites, the remains of a shipwreck with pithos (dolia) can be found. It is located near the islet of Supetar, northwest of the entrance to the port of Cavtat. On a sandy bottom, it covers an area of about 10 x 20 sqm, there are 8 whole, or almost whole dolium, each having a volume of about 1200 liters. It is assumed that this is a shipwreck from the 1st century AD, although the remains of the ship have never been found. The site is unique in the east Adriatic coast, and among a few in the Mediterranean. In the immediate vicinity, several pieces of solitaire amphoras were found, which adds to the richness and righteousness of protection of underwater zone of Cavtat.

## II Registered Underwater Archaeological Zones

### DUBROVNIK – NERTVA COUNTY

- Underwater archaeological zone in front of Cavtat, Municipality of Konavle, Z-6531, comprises a maritime area bounded by the following points: N = 42° 35' 44'' (western cape of the islet of Supetar), N = 42° 35' 18'' (western cape of the islet of Bobara), N = 42° 34' 19'' (eastern cape of the islet of Mrkan), N = 42° 34' 19'' (Seka V. marked by buoy of features B BI(2)24), N = 42° 34' 19'' (reef Šupjerka)

Description: The underwater archaeological zone of Cavtat comprises the area bounded by points on the move: the western cape of the islet of Bobara - western cape of the islet of Supetar - reef Šupjerka - Seka Velika - eastern cape of the islet of Mrkan. In this area, there are two registered finding sites: a site with pithos and a site with amphoras covered with net. There are also two evidenced archaeological and historical sites: a) a dispersed site with amphoras and b) the remains of the military Modern Age shipwreck from the early 19th century. In the waters of Cavtat, in addition to the above findings, the whole area in front of the harbour was used as anchorage, so individual findings were found in a wider area. Due to this concentration of underwater findings and sites, the zone in front of Cavtat was placed under protection.

- Underwater archaeological zone of the island of Mljet, Municipality of Mljet, Z-6562, comprises a sea belt of 300 meters wide from the coasts of the mentioned islands, and all other islets and rocks at a distance of up to 2000 meters of these islands.

Description: In addition to the Mljet National Park, which is located in the western part of the island, due to the wealth of existing and potential underwater archaeological and historical sites, the entire island of Mljet is protected. It comprises a sea belt of 300 m wide from the island, as well as all other islets and rocks at a distance of up to

2000 m. Within the preventively protected zone are 11 registered, 3 preventively protected and 8 evidenced underwater archaeological sites. The oldest findings are the 2nd century BC, and the youngest from the 16th century AD. Among some localities, some are fully preserved, which brings us many new insights about the seafaring traffic in the eastern Adriatic coast.

- Underwater archaeological zone of the islands of Lastovo, Kopač and Brač, and all the islands of the archipelago Lastovnjaci (Donji Škoji), Municipality of Lastovo, Z-6561, comprises a sea belt of 300 meters wide from the coasts of the mentioned islands, and all other islets and rocks at a distance of up to 2000 meters from the mentioned islands.

Description: In the area, a large number of well-known underwater archaeological and historical sites, as well as a number of potential new sites are located. Specifically, in the area of Lastovo there are 19 known underwater sites, 10 of which are registered due to their importance as cultural goods, 1 is preventively protected, and 8 are signaled. Looking chronologically, 17 of them are ancient, 1 is medieval and 1 is Modern Age. The earliest findings are from the 3rd century BC.

#### **SPLIT-DALMATIA COUNTY**

- Underwater archaeological zone of waters of the islands of Vis, Biševo, Brusnik and the Svetac, City of Vis and Komiža, Z-6496, comprises a sea belt of 300 meters wide from the shores of the mentioned islands, and all the other islets and rocks at a distance of up to 2000 meters of these islands.

Description: Underwater archaeological zone of the islands of Vis, Biševo, Brusnik and Svetac is the area with the highest concentration of historical and archaeological findings in the Adriatic. Due to the extremely favorable geographical position of the island of Vis, and thus the extraordinary historical importance of the island, the area around the island of Vis was used as an intersection of historical waterways and military operations from the prehistoric period to the end of the 2nd World War. Within this underwater zone, there are many underwater archaeological sites which are registered in the "Register of Cultural Goods" of Croatia. Taking into account the extremely high concentration of the findings and data collected by divers and fishermen, which indicate the significance of this area in antiquity, the Middle and Modern Ages, it is probable that within this area there are many unknown underwater sites, individual archaeological and/or small groups of findings.

- Underwater archaeological zone of the island of Palagruža, P-3255, the area bounded by coordinates N= 42°22'00", E=16°14'00", N=42°22'00", E=16°21'00", N=42°24'00", E=16°14'00", N=42°24'00", E= 16°21'00"

Description: Due to the natural sea currents as well as its position in the Adriatic Sea, the island of Palagruža has always been on the maritime navigation routes, from the earliest prehistoric periods to the late medieval period and Modern Age. For the same reasons, in the broad underwater area of the island of Palagruža, and the islet of Galijula, there are two newly registered underwater cultural goods and one of the so-called old registrations (RST) which include three sites.

**Protected underwater archaeological zones based on the old resolutions (from the period before independence of the republic of croatia) but which are still in force in terms of legal regulations.**

ISTRA COUNTY

- Underwater archaeological zone Savudrija-Umag, RRI-107

The area from Slovenia border to Umag border comprises three submarine archaeological zones: 1) coastal zone from Cape Savudrija to the southeastern end of the quarry Kanegra, 2) the zone of the bay and the dock of Savudrija, from the Cape Savudrija in the north to the Cape Par in the south, which includes water approach to the bay and the dock Savudrija, transitional waters between shallows Fra Jakome, Cebo and Piranor, 3) the zone of the bay Tora in the north to the bay Karpan in the south, which includes the water approach of the shallows Zanestra, the rock and shallows Sipar and Sipar castle, and Cape Katavra.

- Underwater archaeological zone Umag-Novigrad, RRI-108

Underwater archaeological zone Umag - Novigrad comprises four areas with underwater archaeological sites: 1) The area of coastal waters in the port of Umag from shallows and Cape Pegalota in the north to Cape Mujela south of Umag. 2.) The area from the Sv. Pelegrin bay in the north to Cape Sv. Ivan Kornetski in the south. 3) The area from the Cape Keman in the north to the Cape Dajla in the south. 4.) The area from the Cape Mareda in the north to the Cape Sv. Petar south of Novigrad.

- Underwater archaeological zone Poreč, RRI-109

The area north and south of the bay of Poreč comprises two underwater archaeological zones: 1) The area from the Cape Zub in the north to the Cape Maistro in the south with access waters to Lunga bay, shallows Erba, Keso and Čivran, and cliff opposite the Cape Sataraž. It includes Roman settlements and craft centers in Marina bay and Loron peninsula. 2) Zone from the bay of Sv. Martin in the north to the bay Malendrija and the Cape Sv. Petar in the south. This zone includes the access of waters of the port of Poreč. In this area, there are numerous remains of Roman villas and settlements.

- Underwater archaeological zone Poreč, south, RRI-110

Underwater archaeological zone south of Poreč to Barbariga near Bala comprises six smaller zones: 1) The area of the island of Veliki Školj in the north to shallows Lis and Pojaga at the entrance to the Lim Channel (Limski kanal) in the south. 2) The area from the Cape Križ to the height of the bay of Sv. Feliks. 3) The zone from the island of Figarola in the north to the cliff of Sv. Ivan with a lighthouse, and the island and cape Gartinja in the south, with access waters to Rovinj. 4) The zone of access waters to Sv. Pavao bay. 5) The zone of access waters to Kolone bay. 6) The zone of access waters to the Cape Barbariga from the south and north.

- Underwater archaeological zone Pula, RRI-111

Underwater archaeological zone of wider waters of Pula comprises four smaller areas: 1) From Cape Sv. Ivan on the peninsula Verudica south of Pula to the shallows and the lighthouse Albanež on the cliff Porer. 2) The zone of access waters to Medulin bay from the Cape Kamenjak to the Cape Marlera with the islands Finera, Osja, Boduljaš, Levančić and Veliki Levan, including all internal bays. 3) The zone of access waters to the port Kuje under Ližnjan, from the Cape Debela to the Cape Munat. 4) The zone of access waters to the port Budava, from the Cape Sv. Stipan to the Cape Boka.

- Underwater archaeological zone Labin, RRI-112

In the area from the Cape Prklog near Rabac to Rijeka's harbor, two underwater archaeological zones of monumental importance are located: 1) The zone of access waters to the bay and the dock of Rabac, from the Cape Sv. Juraj to the Cape Sv. Andrija. In this area, dispersed Roman archaeological findings are found. 2) The zone of access waters to the port of Plomin with Plomin channel. In this area, there are the remains of the Roman port Flanona with a pier that extends under the sea. The area from the Cape Prklog to Rijeka's harbor has not been systematically explored.

#### PRIMORJE-GORSKI KOTAR COUNTY

- Underwater archaeological zone on the islands of Cres i Lošinj, RRI-0179

On the islands of Cres and Lošinj there are several underwater archaeological zones, consecutively characterized by dispersed archaeological material of ancient origin: 1) The zone of access waters to Osor bay, from the cape north of Ustrinska port to the Cape Osor, and from the eastern side of the Osor isthmus from the port Studenčić to the bay Majska; 2) The zone from the Cape Kurila to the bay Veli žal; 3) The zone of coastal waters of the islet of Ilovik; and 4) The zone of coastal waters of the island of the Unije from the Cape Stijene to the Cape Vnetak.

- Underwater archaeological zone on the island of Krk, RRI-0177

In the area of coastal waters of the island of Krk, eight zones have the status of an underwater archaeological site: 1) The zone from the Cape Vošćice to Njivice, and

includes Voz bay, Omišalj bay, Sepen bay and Beli Kamik; 2) The zone from the Čavlene bay to Spena; 3) The zone from the Lončarica bay to the Cape of Druženin, including Soline bay; 4) The zone from the Cape of Petrina to Kostrejčica bay; 5) The zone from Mala Jana bay to Mali Bok bay; 6) The zone from the bay of Krk to Crikvena Punta; 7) The zone of coastal waters of Bašćanska Draga to the Mala Luka bay; 8) The zone of coastal waters of island of Prvić from the Cape of Stražica to the rock Njivice.

- Underwater archaeological zone Supetarska Draga, island of Rab, RRI-0178  
In the area of coastal waters of the island of Rab an underwater archaeological zone is located, which has elements of cultural goods and which extends from the Cape Stojan in the northwest, to the Cape Kalifront on the southwest of the island. In this area, which includes the bay of Lopar, Supetarska Draga and Kamporska Draga, an increasing number of dispersed archaeological finding sites is identified, whether individual and group.

- Underwater archaeological zone from the Cape Prklo to Rijeka's harbor, RRI 179/1-1967

In the area from the Cape Prklo to Rijeka's harbor two underwater archaeological zones are located: 1) The zone of access waters to the bay and the dock Rabac, from the Cape Sv. Juraj to the Cape Sv. Andrija, with dispersed Roman findings; and 2) The zone of access waters to the port of Plomin that includes Plomin channel with the remains of the dock and the Roman port Flanona.

#### LIKA – SENJ COUNTY

- Underwater archaeological zone from the bay of Senj to the bays of Mala and Velika Stinica, RRI-176-1975

In the coastal area from the bay of Senj to the bays of Mala and Velika Stinica six underwater archaeological zones are located, rich in dispersed findings of Roman archaeological objects. In this area, there are the remains of a greater importance due to the presence of Roman settlements along the coast.

- Underwater archaeological zone in the bay of Caska, RRI 381-1975

In the area of the bay, especially in coastal areas, the remains of ancient architecture that continues from the land to the sea, are found. From movable findings, to the numerous fragments of tegulas and Roman pottery. This is obviously part of the ancient Cissa, which due to the raising of the sea remained under the present sea level.

## III Individual Preventively Protected Cultural Goods

### 1. ISTRA COUNTY

- UMAG, Shallows Buje

Description: Ancient shipwreck

At a depth of about twenty meters, there is a larger group of amphoras type Lamboglia 2. The upper parts of amphoras are devastated with trawling, but the remaining parts are still preserved *in situ*. Because of its value, and despite the devastation and preservation, the site is covered with a protective cage.

## **2. PRIMORJE-GORSKI KOTAR COUNTY**

- ISLAND OF RAB, Cape Sorinj

Description: Ancient shipwreck

The site is located near the Cape Sorinj on the island of Rab, between the bay of Lopar and Supetarska Draga, approximately 250 m west of the lighthouse found on the cape. There, the remains of an ancient shipwreck with a cargo of amphoras have been located. It is situated on the slant sandy bottom, at a depth of 32 - 37 m. On the surface about 65 amphoras can be found, most of them buried in the sand, with just one of them being almost entirely free. The amphoras are scattered on the surface, which covers an area of 16 x 8 sqm. No devastation or digging at the site has been noticed, which indicates that it consists of mostly complete specimens. Under the sand, there are probably more amphoras and wooden remains of the ship. Because of its value, the site is covered by a protective cage.

## **3. LIKA – SENJ COUNTY**

- NOVALJA, cliff Zakučnica, P-4466

Description: Ancient shipwreck

Near the cliff Zakučnica, on the north side of the island of Pag, a ruined finding site of amphoras type Lamboglia 2 has been discovered. It is located on a sandy slope with the remains of amphoras found at a depth of 22 - 26 meters. Not a single complete specimen of amphora has been preserved, neither a small pottery was found, that could give more information about the origin of the ship that has participated in the accident. Mostly illegible seals were found on three amphoras. One visible seal is located on the handle of one of the amphoras. Based on the amphoras, the shipwreck is dated to the 1st century BC.

## **4. ZADAR COUNTY**

- PAKOŠTANE, Veli škoj, P-4216

Description: Ancient shipwreck

The remains of the wooden structure of the Late Antiquity ship are found a hundred meters northeast of the islet of Veli Školj, towards the harbor Pakoštane. They were discovered in 2004 and systematically researched in 2007. The site is located at the average depth of 2m. The discovered ship's structure is 7 meters long and 6.5 meters wide, with a total area of 40m<sup>2</sup>. Forty-seven boards of outer plating and 56 ship's ribs are found there. The structure was held by the iron nails. Pottery and other movable materials from the same period are found around the structure.

## **5. ŠIBENIK – KNIN COUNTY**

- ŠIBENIK, channel of Sv. Ante, P-4909

Description: Modern Age shipwreck

The wreck of the German torpedo boat class "Schnellboot" S-158 is located in the canal of Sv. Ante, and it got there after Allies had bombed German forces on October 25th, 1944, during the 2nd World War. The ship is 28.4 m long, 4.4 m wide, with the displacement of 57 tons, powered by three diesel engines Daimler-Benz MB 500. Today, it is located at the depth of 38 - 40 meters. The bow of the ship is damaged (blown up during the bombing), while the hull and stern are relatively well preserved. Over the middle part of the wreck there is a fishing net. Around the wreck, a large number of items from the boat (e.g. ship's equipment, utensils, weapons, torpedoes head etc) can be found.

- ŽIRJE, bay of Balun, P-4932

Description: Wreck of the plane, a German plane Ju87 Štuka

The wreck of the Ju 87 Štuka bomber from 2nd World War was found in the bay of Balun on the island of Žirje. It is a plane of the Air Force of Italy, which was damaged with cannon fire, during the air defense of the Kingdom of Yugoslavia in the April War, in 1941. During the field inspections, in the immediate vicinity of the plane, a plane engine was found. The plane type Ju 87R-2 had two crew members, engine Junkers Jumo 211D, a length of 11.1 m and wingspan of 13.8 meters. It was armed with two fixed machine guns MG 17, caliber 7.92 mm located in wings, and one movable machine gun MG 15, caliber 7.92 mm in the rear cabin.

- ŽIRJE, bay of Juro, P-5503

Description: Ancient shipwreck

The underwater archaeological site near the bay of Juro on the island of Žirje, is the first discovered well-preserved archaeological site of a shipwreck from the 3rd century BC in Croatian waters. Group of visible findings extend to a depth from 20 to 38.5 m,

and cover an area of 10x46 sqm. The rocky seabed is gradually formed, with a stone staircase and thin sandy sediments found at depths of about 22.5 - 30 m. Most of the findings are fully or partially preserved, and include among others amphoras with a heart-shaped belly, a short cylindrical neck, the characteristic slanted rim, and two handles which descend from the neck to the shoulder of the vessel. It is the so-called Corinth B type, which was produced on the island of Corfu in Greece, and in the Greek colony Pharos in Stari Grad on the island of Hvar during the 4th and 3rd century BC. Among fragments, whole specimens of the domestic ceramic utensils of different shapes (part of kitchen equipment) can be found as well.

## **6. SPLIT – DALMATIA COUNTY**

- SEGET DONJI, P-4472

Description: The remains of the ancient port

In the seabed of Seget Donji, in the wider area, east of the cemetery church of Gospa od Konacvina, are the remains of the ancient port facilities. These are the findings of the processed stone blocks that form the structure of the wall, which with some interruptions extend at a distance of about 90 meters. Also, with an overview of the terrain, pottery fragments from different historical periods, but mostly from ancient times, can be noticed as well.

- STARI GRAD, ISLAND OF HVAR, P-5269

Description: The remains of the ancient coast and the dock

In the bay of Stari Grad, just a little east from the hotel Helios, the remains which point to the existence of the ancient coast in the sea can be found. The whole bottom of the area is covered with fragments of ancient pottery. To the west, at the western pier "Bonja", a visitor can see a stone hillside covered with various calcified ceramic pots and amphoras, that are covered with marine biofouling and calcification. The entire hillside is around 14m long, and pier foundations can be found in the east side. A bit further east from the hotel Helios, at a distance of 9 -10m, and at the absolute depth of -1,98m to -2,55m, the second part of the ancient coast is located, which has the same characteristics as the previously mentioned part.

- JELSA, ISLAND OF HVAR, bay of Rake on the island of Šćedro, P-5268

Description: The remains of the ancient port and dock

On the bottom of the bay at a depth of 10 meters there are numerous fragments of pottery dating from Roman times to the Modern Age. At the bottom of the bay on the west side, roughly processed blocks are scattered in the area, which are remnants of

the ancient 6-meter long pier. The width of the scattered blocks is 6 meters, but the ancient pier itself was probably not wider than 3 meters. On the eastern side of the bay there is a pier in whose extension are the stone ruins which are probably part of the older structure. At this place, the remains of the tesserae and the background for the mosaic have been identified. About 12 meters to the extension of the pier, 2 meters to the east and at 2 meters of depth, are the remains of the bottom part of pythos. The visible part of pythos is 1-meter long, and the cross-section of the side is 4 cm. On the western side of the bay, in several places on the bottom below the sludge, large quantities of parts of amphoras and other ceramic material of ancient origin can be found. Considering all the findings, it is evident that it is a complex of ancient economic facilities (maritime villas), of large prevalence and importance.

- KAŠTELA, Kaštel Stari, P-5346

Description: The remains of the Modern Age architecture, castle “Andreis”  
Venetian authorities issued in 1482 a permit to Andrija Cega to build a castle, however, only in 1600 the Ivan and Pavao Andreis completed the commenced construction. The appearance of the castle was recorded in the plan of the settlement from 1704, in which a visitor can see the castle Andreis. It had a rectangular shape and belonged to the typology of fortified house. The north facade was fortified, and on the southern part there was a door for accession by boat. On the cadastre of, 1831 Andreis castle was designated as a ruin. Today, it is considered a ruin visible in the sea. Over the following years, the northern part of the rest of the castle acted as aid to the shore construction.

## 7. DUBROVNIK - NERETVA COUNTY

- DUBROVNIK, Batahovina, Rijeka dubrovačka, P-4243

Description: Ancient shipwreck

The site is located in the area of Batahovina in Rijeka Dubrovačka, about 450 m northeast of the bridge dr. Franjo Tuđman and 22 m from the shore, at a depth of 20 - 23 m. There the remains of probably an ancient shipwreck have been recorded. The only visible objects, are the individual fragments of amphoras (parts of belly, bottom and parts of neck with handles). The main concentration of fragments of amphoras covers an area of about 2 x 5 sqm, whereas it's wider in some places. It can be assumed that under the sand, are the remaining parts of amphoras and the wooden structure of the ship. According to the typological features of the fragments of amphoras, they are parts of Greco - Italic amphoras, based on which the entire site can be dated to the 3rd - 2nd century BC.

- DUBROVNIK, Šipan, Luka Šipanska, between the islands of Jakljan, Crkvina and Tajan, P-5523

Description: Ancient shipwreck

It is about the remains of an ancient shipwreck that was carrying stone sarcophagi. The indicative dating is in the 3rd century AD. It is located west of Šipanska Luka, between the islets of Crkvina, Tajan and Jakljan. At a depth of 37 m there are three coffins of stone sarcophagi and three lids. The sarcophagi are of simple construction, without decoration. The lids are made in the form of a gable roof with corner acroteria. Two coffins and two lids are mostly above the surface, while the third pair is almost entirely buried in the sand. Coffins are 214 cm long, 70 cm wide and 74 cm high. The depth of the coffins is 54 cm, and the width of the walls varies from 10 to 15 cm. The size of the lids of sarcophagi fits the measures of coffins. The visible part of the findings spreads on the surface and covers an area of 7 x 5 sqm. Except the sarcophagus, no other movable findings or ship remains can be found on the surface.

- DUBROVNIK, Šipan, Cape Tiha, P-4510

Description: Ancient shipwreck

This is an ancient shipwreck near Cape Tiha on the island of Šipan, located on the inner side of the island, northwest of Luka Šipanska, about a hundred meters east of the lighthouse on the Cape Tiha. The remains of the wreck are located on a slant sandy bottom, at a depth of 17 - 20 m, and cover an area of about 10 x 5 sqm. One can assume that most of the cargo and the wooden structure of the ship is below the sand. On the surface, a large amount of fragments of amphoras, and 4 - 5 almost complete amphoras can be found. Given the lack of complete amphoras, it can be assumed that the surface layer of the site is destroyed. According to the so-called Greek Italic amphoras, the shipwreck can be dated back to the 3rd - 2nd century BC, which places it among the oldest shipwrecks in the Dubrovnik area.

- CAVTAT, near Cape Sustjepan, position "Topovi", in front of the bay Cavtat, P-4239

Description: Modern Age shipwreck

The remains of the medieval shipwreck are located west of the entrance to the bay of Cavtat, about 850 meters west of the Cape Sustjepan, at a depth of 30 - 32 m. On the surface of the sandy seabed, at an area of about 20 x 30 sqm, are located the remains of six iron cannons, 2 anchors, a group of cannon balls, rifles and other findings that have remained from the smaller warship. It is probably a shipwreck from the beginning of the 19th century, or from the period of the Napoleonic Wars. In the same area, fragments of at least two different amphoras, probably solitaire amphoras, have been identified, as a result of using a wider area for the purposes of anchorage in front of the harbor of the ancient Epidaurum.

- CAVTAT, between Cavtat and Molunat, P-3473

Description: Modern Age shipwreck, wreck of the cruiser “Giuseppe Garibaldi”

The Italian armored cruiser “Giuseppe Garibaldi” was one of the most important ships in the fleet of the Italian Royal Navy during the 1st World War. Its construction began in 1898 in the Italian shipyard Cantieri Ansaldo of Genova Sestri, and was launched into the sea in 1901. The whole ship was clad by steel of various thicknesses from 38 to 150 mm. The total length of the ship is 111.76 m, and the length over the waterline is 104.89 m. The width of the ship is 18.25 meters, and the draft is 7.10 m. The usual ship crew consisted of 25 officers and 530 sailors, and the ship could develop a speed of 19 nodes. At a speed of 10 knots, the ship could pass 4400 NM. It was armed with 29 guns of various calibers, and four torpedo tubes of 450 mm. It was sunk by the Austro-Hungarian submarine “U 4”, on the 17th July 1915, where 53 persons were killed and 525 persons were rescued. Three minutes after it had sunk to the bottom of the sea, the rest of the Italian fleet withdrew to Italy.

The position of the wreckage is about 3.4 NM from the coast and Konavle cliffs (Cape Pač) between Cavtat and Molunat. Today it is located at a depth of 122 - 124 m, and the individual higher parts of the ship are at 104 meters. The ship lies on its left side, partly buried in the mud and towards the stern there is a large crack, probably caused from the explosion.

- SLANO, near Cape Gornji, bay of Slano, P-3981

Description: Ancient shipwreck

The ancient shipwreck at the position Cape Gornji, Slano, is located in the east side of the entrance to the bay of Slano. In the remaining parts of the ancient shipwreck are the fragments of amphoras type Lamboglia 2, and based on them the site is dated back to the 2nd - 1st century BC. North from the fragments of amphoras, wooden ribs of the ship can be observed, which indicate the possibility that large parts of the ship's structure are buried under the sand. A little further from the remains of the shipwreck, there is a smaller warship, probably of a German landing craft from 2nd World War.

- MLJET, Pomena, east of the island of Glavat, P-4746

Description: Ancient shipwreck

The remains of an ancient shipwreck are located on the east side of the island of Glavat, northeast of Pomena. It consists mostly of large and small fragments of amphoras, which are calcified along the seabed, forming several large fields. Most of the amphoras are type Lamboglia 2, and there are several types of necks of amphoras type Dressel 2 - 4, due to which the entire shipwreck can be dated to the 1st century BC.

- MLJET, Saplnara, near the Cape Vratnički, P-4237

Description: Ancient shipwreck

The ancient shipwreck near the Cape Vratnički, in the easternmost part of the island of Mljet, is located west of the islet of Veli Školj, on the west side of the Cape Vratnički, about 45 meters from the coast. It can be assumed that the ship crashed into the shore and broke up, and the findings were scattered on a slant rocky ground. The highest concentration of the findings is at a depth of 18 - 22 m, along the stone rocks, where the fragments of amphoras stuck together and got into cracks. Part of the fossilized fragments of amphoras is at a depth of 8 m. Close to the rock walls, deep in the water, meadows of the angiosperm *Posidonia oceanica* can be observed. Based on the fragments of amphoras type Dressel 2 - 4 and type Koan, the entire site is dated from the second half of the 1st century to the first half of the 2nd century AD.

- MLJET, bay of Gonoturska

Description: Ancient shipwreck

The site is located approximately 0.3 NM southeast of Solin, about 40 meters from the coast, at a depth of 33 - 34 m, but the individual findings are found also in shallow depths. Within the framework of research in 2008, 7 complete and fragments of amphoras were lifted to the surface. Additionally, two complete amphoras lie at a depth of 24 m, while three complete amphoras, with minor damage, lie at depths from 32 - 34 m. One of them is encrusted with a small stone wall, while all the others lie on the sandy bottom. According to the type of amphoras (Lamboglia 2), the remains of a shipwreck are dated from the 2nd to 1st century BC.

- OREBIĆ, LOVIŠTE, Malo more, P-4248

Description: ancient shipwreck

The underwater archaeological site near Lovište on the Pelješac peninsula is located 1.15 NM east of the tip of the Pelješac peninsula, north of Lovište, about 250 meters from the coast. At the depth of 31 - 37 m, at the transition of the rocky bottom in the sand, 7 necks, and a dozen bellies and bottoms of amphoras can be observed. The narrow concentration of the findings spreads out at an area of about 8 x 8 sqm. According to the characteristics of amphoras, it can be concluded that these belong probably to the remains of an ancient shipwreck from the period of 3rd - 2nd century BC. In fact, most of the necks of amphoras belong to different subtypes of Greco - Italic amphoras, with one neck belonging to the so-called type Korinth B, and another (which has long handles) to the transitional forms from the Greco - Italic type to Lamboglia 2.

- KORČULA, Lučnjak shallows, P-4240

Description: Ancient shipwreck

The underwater archaeological finding Lučnjak is located in shallow waters, at about 1.2 NM east of the town of Korčula, between the islands of Lučnjak and Badija. It is in

a shallow which is located on the waterway, which often caused obstacles to navigation, from the ancient times to today. As a result, numerous shipwrecks have occurred, of which only numerous fragments or individually complete pieces of amphoras and other pottery have remained. According to the findings of the Greek Korinth B amphoras, and amphoras of Lamboglia 2, Dressel 6a, Dressel 30, North African cylindrical and Late Byzantine amphoras with ribbed belly, it can be assumed that more shipwrecks occurred in the period from the 4th/3rd century BC to the 5th/6th century AD.

- LASTOVO, Lastovnjaci, Petrovac shallows, P-2562

Description: Ancient shipwreck

An ancient shipwreck from probably the 2nd to 1st century BC is located in the area. In fact, on the stone slope of Petrovac shallows, which drops steeply into the depths, there is a concentration of four lead crossbars of 2.1 m long, 0.35 wide m and 0.20 m high each. The crossbars are apart from each at about 2 - 4 m. The site is at a depth of 38 - 39 m. Below the crossbars, and under the rocks, an amphora was noticed, which probably belongs to the type Lamboglia 2 (with the neck encrusted with a rock, so only the belly is visible and the bottom of the amphora). The amphora is at a depth of 42 m. There is a great possibility, that under the sand there is the remains of the ship and cargo.

## Final Analysis

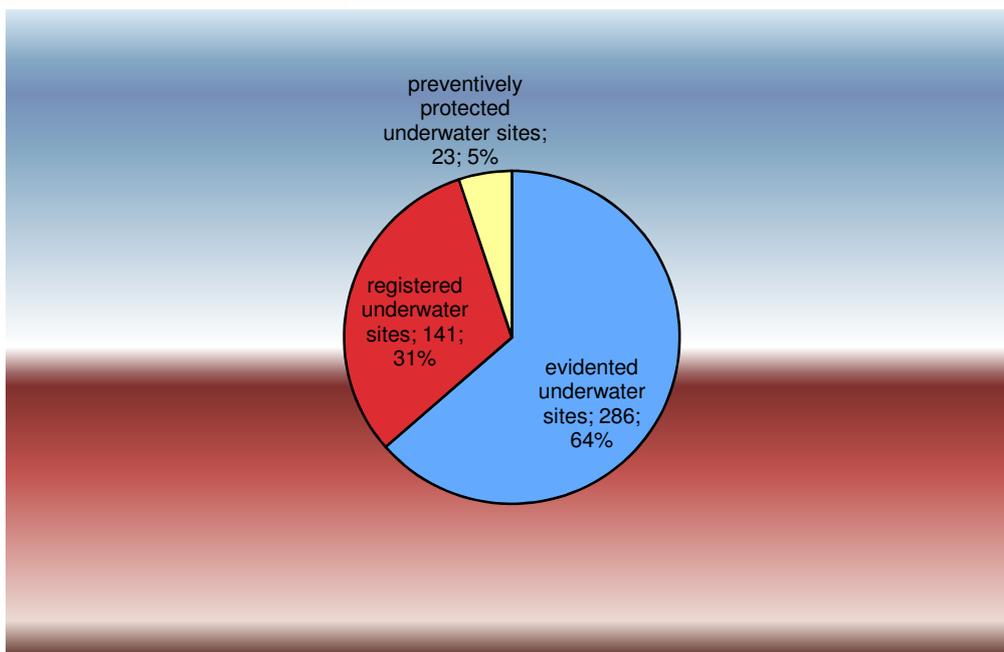
### OF THE SITUATION OF REGISTERED AND PREVENTIVELY PROTECTED UNDERWATER CULTURAL GOODS AND UNDERWATER ZONES

In accordance to the categories described in the introduction (registered, preventively protected and evidenced cultural goods) it can be said that, in the seabed of the Republic of Croatia, around 450 underwater archaeological sites have been recorded. Of these, 141 are registered as individual underwater cultural goods, 5 are registered as underwater archaeological zones, 23 are individual preventively protected underwater cultural goods, and the other are evidenced underwater sites.

If we look only at the waters of Dubrovnik - Neretva County, then we can say that around 100 underwater archaeological sites are known today, 34 of which are individually registered underwater cultural goods, 3 are registered as underwater archaeological zones and 12 are individual preventively protected underwater cultural goods. In relation to this, in terms of the protection of underwater cultural goods, it is necessary to emphasize that this information addresses to the current state, and that every year new underwater archeological sites are discovered. Some sites were recorded as previously evidenced, and some are sometimes preventively protected receiving permanent legal protection, and becoming registered sites.

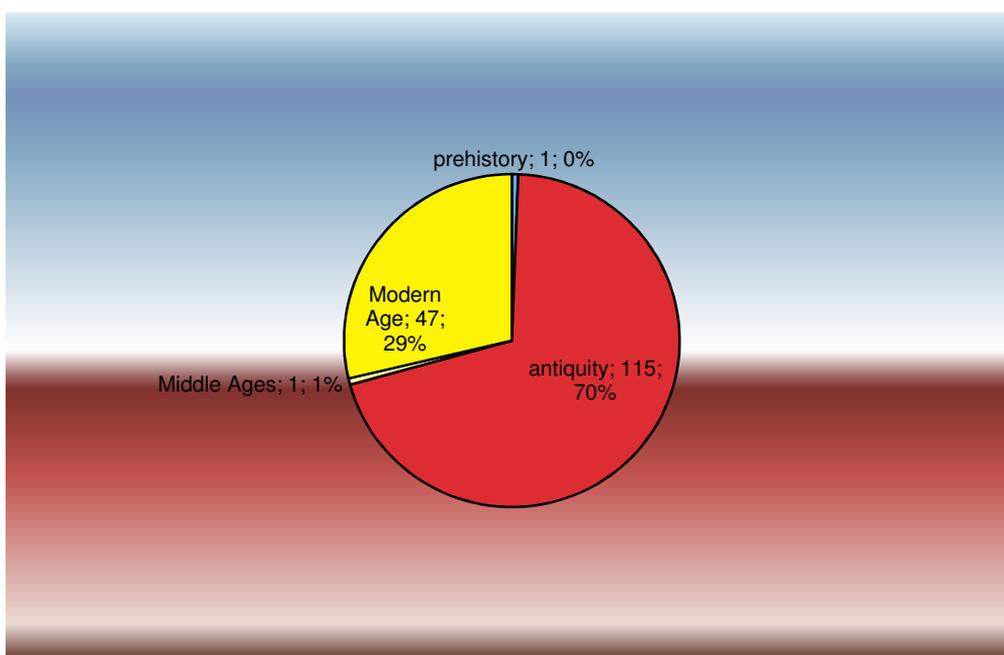
At the end of the displayed list of underwater cultural goods are also the so-called old protected underwater archaeological zones. These are the zones which are legally protected on the basis of old solutions (from the period before the independence of the Republic of Croatia, roughly in the period 1960 - 1990) and which are still in force in terms of legal regulations. However, such zones (a total of 12), will not be processed in the statistical data given below, since they might give a distorted representation of the underwater heritage. In fact, according to these old solutions almost the whole seabed from Umag to Kvarner and the associated coast is considered protected.

In the charts given below, only the individual registered and preventively protected underwater archaeological sites (164 of them) are statistically analyzed. The above mentioned and described underwater archaeological zones cover wide areas, and they already contain individual sites, therefore they were not included in the statistical analysis. As far as the evidenced underwater archaeological sites, they are processed only in the first chart, and it should be noted that their number (286) is only indicative, based to the available literature and incomplete lists of the competent authorities. For the evidenced underwater archaeological sites no single list exists, whereas information on their exact positions, types of sites and other intel is still missing.



**Chart 1:** *The relationship of underwater archaeological sites according to the type of protection*

Previously it was stated that in the seabed of the Republic of Croatia about 450 underwater archaeological sites are known, with 164 legally protected, and for them there is an appropriate legal instrument: The decision on registration or the decision on preventive protection. Statistically speaking, 164 of these sites for which complete data exist, belong mostly to the ancient times, with just a few of them from the medieval and prehistoric periods.



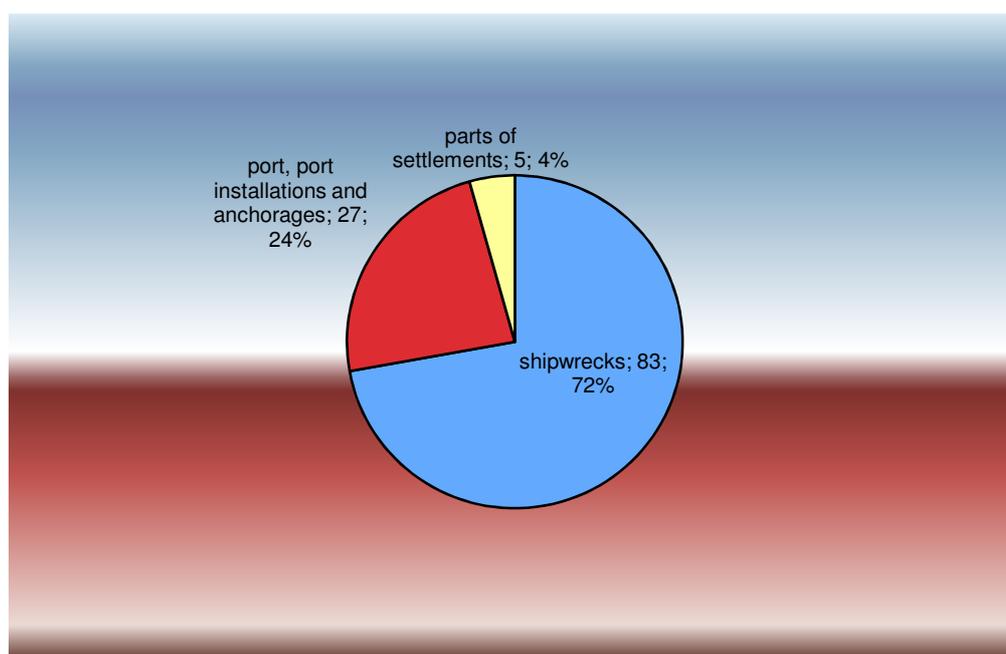
**Chart 2:** *The protected (registered and preventively protected, individual) underwater archaeological sites according to archaeological periods.*

Here we can not elaborate on periodization and chronological classification of periods. But, roughly speaking, in the seabed of Adriatic the absolute dating would be:

- The prehistoric period until the 4th century BC
- The ancient period from the 4th century BC to the 7th century AD
- The medieval period: 8th century to the 15th century
- The modern Age period: 16th century - 2nd World War

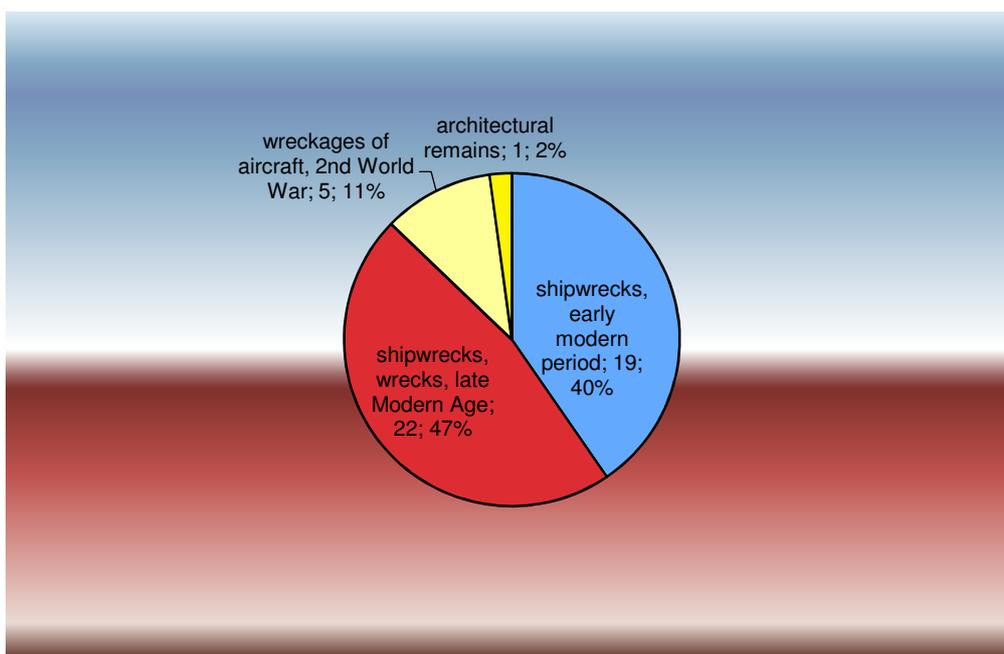
The only site from the prehistoric period presented here is of the remains of a settlement which is found below sea level, due to ocean elevation. Except that, the only site from the Medieval period is that of the remains of a shipwreck.

From the ancient times (4<sup>th</sup> century BC – 7<sup>th</sup> century AD), the most common findings were the remains of shipwrecks with a cargo of Greek and Roman amphoras and dolia, then the remains of ports, port installations and anchorages, and settlements where some parts are found below sea level.



**Chart 3:** The type of sites based on the findings from the ancient period (4<sup>th</sup> century BC to 7<sup>th</sup> century AD).

In the Modern Period (16<sup>th</sup> century to II World War), the findings were mostly remnants of shipwrecks, with just one of them listed as remnants of the building, (i.e. part of the fortress that is found today under the sea). In general, we can distinguish the shipwrecks from the early modern period of 16th - 18th century, and the shipwrecks from the 19th century - 2nd World War, and the wreckage of the planes from 2<sup>nd</sup> World War.



**Chart 4:** Type of sites based on the findings dated in the Modern Age period (16<sup>th</sup> century to II World War).

### Underwater archaeological sites covered by a protective cage

Within the individual registered underwater cultural goods, we can identify those sites over which an iron, protective cage, was placed as a special form of physical protection, but also a kind of a specific form of presentation of underwater cultural heritage. These measures are usually implemented in order to assure that the remains of ancient shipwrecks with a cargo of amphoras are exceptionally preserved and presented. On such sites, organized tourist diving activities can be carried out, which will be explained in more detail in the following chapters. A short list of such sites protected by a cage is presented here:

1. UMAG, Shallows Buje
2. ISLAND OF PAG, NOVALJA, bay of Mala Vlačka, Z-6433
3. ISLAND OF RAB, Cape Sorinj
4. ISLAND OF ŽIRJE, between bays of Muna and Koromačna, Z – 53
5. LASTOVO, in front of the bay of Gornja Planika, Z - 54
6. LASTOVO, along the island of Saprun, Z - 33
7. MLJET, Okuklje, position Klačine, Z - 88
8. CAVTAT, Shallows Velika, Z - 56



*Figure 8: Map showing the location of sites that are protected by an iron cage*

## Legislative framework

### Guidelines for Marine Protected Areas / Diving parks / Submarine museums

In Croatia, there are no official guidelines for the protected marine areas, and the protected underwater archaeological sites. However, the following indicative guidelines can be presented as a starting point for any future strategy regarding this topic:

- In accordance with the international UNESCO Convention on the Protection of the Underwater Cultural Heritage, as well as the positive regulations of Croatia, one should endeavour to use non-destructive methods of research and documentation as much as possible, and avoid extracting archaeological findings from the sea.
- To carry out activities to promote the presentation of underwater archaeological heritage *in situ*, or on the bottom of the sea, to get the real museums in the sea or underwater archaeological parks.
- To promote the importance of underwater cultural permeation and natural heritage tourism with the aim of refining and protecting of all the involved factors.
- To carefully plan and subsequently monitor, the activities carried out on the underwater heritage should be supervised, and the tourist offers enriched.
- To promote and popularize values of underwater cultural and natural heritage in order to strengthen awareness among the wider population about the

importance of this segment of heritage, which is also the best way of protecting it.

- To use modern technological achievements in research, documentation and presentation of underwater cultural and natural heritage.
- To involve the local community in the promotion and presentation of underwater cultural and natural heritage.

## **Legislation for Marine Protected Areas / Diving parks / Submarine museums**

### **1. UNESCO Convention on the Protection of the Underwater Cultural Heritage**

On 2nd November 2001, in Paris, the UNESCO Convention on the Protection of Underwater Cultural Heritage was adopted. The Republic of Croatia was the third country to ratify the Convention, confirming the importance that Croatia gives to the protection of underwater cultural heritage. It is the first multilateral treaty which systematically and comprehensively deals with the protection of underwater cultural goods. On 17th September 2004, the Decision of the President of the Republic of Croatia on the promulgation of the Law on Ratification of the Convention on the Protection of Underwater Cultural Heritage (Official Gazette 10/04).

According to the said Convention, *underwater cultural heritage* means that all the traces of human existence of cultural, historical or archaeological character, which has been partially or totally under the water, periodically or continuously, for at least 100 years. Among other determinants, by the Convention is defined also that the preservation of underwater cultural heritage *in situ* is considered the first option, and that priority is given to non-destructive methods of research and documentation over extraction of the objects. Therefore, this project is fully in line with the Convention, as the usual theoretical and practical treatment of the underwater cultural heritage in Croatia as well as the performance of diving and research of the heritage.

## **2. Legislation related to diving and research of cultural heritage in Croatia**

### **2.1. The legal framework of recreational and tourist diving on the underwater cultural heritage**

The protected underwater archaeological heritage, as shown in previous chapters, includes registered and individual preventively protected cultural goods and wider areas or protected zones. Regardless of the type of protection (registration, preventive protection) as well as the area of spread (individual sites or wider areas), on such cultural goods it is possible only organized performance of diving (in terms of sport recreational, tourist diving), research, recording and related activities, with the approval of the competent authority or competent conservation departments, the Directorate for the Protection of Cultural Heritage in the Ministry of Culture.

All this is regulated by the Act on the Protection and Preservation of Cultural Goods (Official Gazette no. 69/99, 151/01, 157/03, 87/09, 88/10, 61/11, 25/12, 136/12, 157/13 and 152714) (hereinafter “Act”) and the Regulations on the procedure and method of granting a permit for performing underwater activities in the internal waters and territorial sea of the Croatia which are protected as a cultural heritage (Official Gazette 22/09, 36/11 and 58/14) (hereinafter: the “Regulations on the procedure and method of granting a permit”), which follows from the above mentioned “Act”.

The entire process is elaborated in a way that the Ministry of Culture, based on the “Regulations on the procedure and method of granting a permit” brings The Five-Year program of underwater activities in the internal sea waters and territorial sea of the Croatia in the areas where there is a cultural heritage (hereinafter: The Five Year program). The last such program is from 2014 and refers to the period 2014 - 2018. The program provides a list of all the sites and zones for which permission can be obtained, the number of permits, the minimum annual fee for diving and any special conditions of diving and obligations of the permit holder (e.g. it is not permitted to enter the wreck, touch weapons, setting on the anchor blocks, cleaning of protective nets, etc.).

Based on the above programs and regulations the Ministry of Culture releases the Tender for granting a permit for diving in protected areas for a certain period of five years, which is published in the Official Gazette.

The tender process can be applied on:

- Diving centers (companies and crafts)
- Diving clubs (civic associations, non-profit organizations)

Diving centers must meet certain requirements in terms of

- Registration of legal person for tourist activities of organizing and carrying out tourist diving (proven by an expert from the register of activities);
- Dive leaders with minimum qualifications R \*\*\* or instructors by categorisation of recognized diving schools registered in the Ministry of Education and Sports;
- Dive leaders must be employees of a legal entity or engaged in them under separate contracts (proof of diving qualification and a copy of the employment contract or other relevant contract);

The tender process can not be applied on diving centers or clubs, and their applications will not be taken into consideration, if during the last five years they have been involved in two or more irregularities, associated to work in the field of cultural heritage protection.

The Minister of Culture appoints an Expert Commission of five members for the implementation of the tender process which will consider all the applications and decide which ones are valid, and which diving centers get the permission to dive on certain cultural goods.

The main parameters when selecting dive centers and authorize permission to organize and conduct diving on cultural goods are:

- The offered amount of the annual fee (for a minimum of a Five Year program)
- The employment of local population (priority is given to diving centers that employ local population)
- The active participation in the protection of cultural heritage (previous participation in research, registration of new locations)
- The proximity to a protected area - the zone for which the permit is requested (giving priority to the diving centers that are closer to the zone or locality)

The decision of the Expert Commission is forwarded to the competent conservation departments that on the basis of such decisions adopt suitable Resolutions, (i.e. approvals for diving given to dive centers).

Obligations of the holder of the permit, (i.e. diving instructor) are:

- To keep a diary of diving and related diving list (list of divers participating in each dive with specified time and place of diving, and dive leader's name).
- To fax the mentioned diving list to the Ministry of Culture before each dive so that it is always known when and where a diving takes place, and who participate in it. Statistics of dives and number of visitors is prepared at the end of each year.
- To prevent damaging the cultural assets and extraction of objects.
- To inform the Ministry of Culture, the competent port authority and the maritime police in the case of discovering new findings or sites, or observing changes and/or illegal acts on existing sites.
- The diving leader must be with the participating divers throughout the scheduled dives.

Permission to organize and conduct diving on cultural goods can also be requested by the diving clubs (non-profit organizations, civic associations) provided that they made a specific program related to the protection of seabed (underwater inspections, creation of bottom sketches, etc.) which contributes to the protection and preservation of cultural goods. Diving clubs do not pay a fee for diving, and only the club members can dive.

This possibility was introduced primarily because of the local diving clubs on the islands, which are also protected zones, and not to disable the local indigenous

population to dive. In addition, most of the data on new sites comes from such diving clubs, and it is in the interest of the Ministry of Culture to provide diving also to the clubs.

In addition to the described multi-year permits, the competent conservation departments of the Ministry of Culture may optionally issue single-use permits which must be clear, promotional, memorial or have an educational character.

With this procedure, the process for obtaining the permit to organize and conduct diving on cultural goods has enhanced control and protection of the underwater cultural heritage. On most sites, performed dives for control purposes, happen in an almost daily basis, which has proven essential for the timely and promptly monitoring of the sites.

Besides that, through this way, the development of touristic offers for Croatia, the development of local diving centers (also financially) and the indirectly protection of cultural goods through the efforts of the Ministry of Culture, are achieved. In fact, the diving centers have realised that it is in their true interest to contribute to the care and preservation of underwater cultural heritage sites, in order to prolong the visitability of those sites by tourists, thus their income. In the same time they are developing awareness for the importance and necessity of cultural heritage.

## **2.2. The legal framework for conducting underwater archaeological researches in Croatia**

All archaeological researches in Croatia, including underwater, are regulated by the Regulations on Archaeological Research (NN 102/10), which is derived from the “Act”. All the rules and obligations of the said Regulations are common to all archaeological researches, provided that certain articles refer exclusively to underwater archaeological research.

Thus, for each archaeological research it is necessary to acquire a permission from the competent conservation department of the Ministry of Culture, which describes and gives information on the following characteristics: a) the time, b) the place of research, c) the type of research (trial or systematic excavation, field inspections, non-destructive research methods: geophysical, geo-radar researches, aero archaeology etc.), d) the research leader and other participants, e) the place of storage, conservation and restoration of materials, f) the photos taken and other descriptive and field documentation materials etc.

It is important to note that the financial resources with which researches are carried out must be sufficient for the planned excavation, as well as for the conservation and restoration of movable and immovable archaeological findings and sites.

In addition to these standard conditions for all kinds of archaeological research, the additional conditions in underwater research required are:

- The lead researcher, which must be an archaeologist and a Croatian citizen, must have a minimum diving qualification of CMAS 3 \* or the equivalent in other diving associations, and a minimum of 24 months experience gained by participating in field research.
- A list of all the divers participating in the research project, with the appropriate professional and diving qualifications corresponding to the estimated depth of diving and the medical certificate of good health for professional diving.
- An information on diving equipment and instruments for underwater researches.
- A lead researcher is obliged to ensure marking of areas where research is carried out in accordance with special Ordinance on Performing Underwater Activities.
- The lead researcher is obliged to immediately inform the competent port authority on the beginning, termination, continuation or abandonment of works.

In all researches, regardless of whether they are terrestrial or underwater, domestic and foreign physical and legal entities can participate as well, on the basis of the approval by the competent authority. Foreign physical and legal entities can participate in research if they have the permits required by the special regulations (i.e. Aliens Act), and with the condition of reciprocity. The request for participation of foreign physical and legal entities submits the technical leader of the research.

The protection of underwater archaeological and historical heritage is regulated by the Act on the Protection and Preservation of Cultural Goods, and two Regulations concerning the (tourist) diving on cultural goods and archaeological research of cultural goods, including underwater.

This kind of protection is considered good, in terms of the legal and theoretical sense, but the most important factor is the physical control, (i.e. presence and surveillance at sea) by the competent institutions of the Ministry of Culture, the Port Authority and the Marine Police. For now, the cooperation of those institutions is intense and positive, and in the last time also enhanced through the work of the Coast Guard.

#### LITERATURE AND DATA SOURCES:

- Register of Cultural Goods of Croatia
- Frka D, Mesić J., *Tajne Jadrana (secrets of the Adriatic), diving guide of wrecks of Croatian Adriatic Sea*, Rijeka, 2002.
- Perkić D., *Inspection of the Ministry of Culture on cultural property under the sea, Ronilac (diver) 1 / 1*, Rijeka, 2003, pages 78 – 81.

- Perkić D., L'attività del Dipartimento per i lavori d'ispezione svolta sui beni culturali sommersi, *Archaeologia subacquea in Croazia, Studi e ricerche*, Venezia, 2006, pages 157-163.
- Perkić D., Muzej u moru (Museum under the Sea), *Welcome* 16, Dubrovnik, 2008, pages 43-47.
- Šošić T. M., UNESCO Convention on the Protection of the Underwater Cultural Heritage and state jurisdiction in the Adriatic Sea, *Comparative Maritime Law*, Vol 49, No. 164, 2010, pages 101-138.

## **Main laws and regulations**

- Act on the Protection and Preservation of Cultural Goods ("NN" br. 69/99, 151/01, 157/03, 87/09, 88/10, 61/11, 25/12, 136/12, 157/13 i 152/14)
- Ordinance on the form, content and manner of keeping the Register of Cultural Goods of Croatia (NN 89/11 i 130/13)
- Decision of the President of the Republic on the promulgation of the Law on Ratification of the Convention on the Protection of Underwater Cultural Heritage (NN 10/04)
- Regulations on the procedure and method of granting a permit for performing underwater activities in the internal waters and territorial sea of the Croatia which are protected as a cultural heritage (NN 22/09, 36/11 i 58/14)
- Regulations on Archaeological Research (NN 102/10)
- Ordinance on Performing Underwater Activities (NN 47/99, 23/03, 28/03, 52/03, 58/03 i 96/10).

## GREECE

### Analysis of Underwater Museums and Archaeological Sites

The huge Underwater Heritage of Greece is managed by the Hellenic Ministry of Culture and Sports, through the Ephorate of Underwater Antiquities.

Below, a short description of the Underwater Museum of Kea Island and of the Accessible Underwater Archaeological Sites all over Greece.



*Figure 9: map of Greece and its Islands*

### Underwater Museums

#### Exemplar Aegean Underwater Museum of Kea Island (Cyclades)

The Kea Interregional Program, Greece-Cyprus 2014-2020 concerns the Foundation of the Exemplar Aegean Underwater Museum of Kea Island, for the historical shipwreck of Britannic, Burdigala and Patris (1st World War). The Foundation is still in progress and the wrecks are about to be declared as Historical Underwater Museums.

Britannic: it was a ship of the Britannic White Star Company, along with OLYMPIC 45,424 gt (gross register tonnage) and the Titanic 46.328 gt. Britannic is considered to be Titanic's sister ship.

It was launched on 26th February 2014 in Belfast in order to be used in the itinerary of North Atlantic lines, whereas during the 1st World War it became a floating hospital. It was equipped with two surgical halls, a hospital ward, research laboratories, an X-ray laboratory, a dental department, a pharmacy and a morgue.

It bore the insignia of military Red Cross ships. The hull was white with a green stripe along it, which was interrupted by big red crosses. For its recognition, red crosses on the upper deck were lit in the dark. Its capacity is 48,158 gt.

The ship's staff was consisted of: 101 nurses, 336 officers and unskilled male nurses and 3,309 hospital beds. During its 6th journey in the East Mediterranean, which started from Southampton on 12th November 1916, it bumped into a mine placed by submarine U73.

On 4th December 1975, it was discovered by Jacques Cousteau. In 1990, it was purchased by the English amateur historian Simon Mills. The Britannic is a prominent monument in Greek waters and this is why the last years it has attracted the diving interest of several people.

S/S BURDIGALA (Schnelldampfer Kaiser Friedrich): Kaiser Friedrich was launched on 5<sup>th</sup> October 1897 in F. Schichau shipyard in Danzig in Poland. Its dimensions were 182.9X19.4 meters. Its shipbuilding was completed in May 1898 and its speed scarcely reached 20 knots in all of its journeys.

On 7<sup>th</sup> June of the same year it set off on its inaugural trip from Bremerhaven to New York, with the potential to take aboard 400 passengers in the 1st class, 250 in the 2nd and 700 in the third and with a crew of 420 people. However, in October 1900, it returned to Schichau shipyard, to its owners and it remained decommissioned for 12 years.

In May 1912, it was purchased by Compagnie de Navigation Sud Atlantique, which proceeded to its renovation and the ship was renamed Burdigala, after the Latin word for Bordeaux. But it was unprofitable due to large fuel consumption. Finally, in May 1915, Burdigala was requisitioned to the French Navy and was converted into an assisting cruiser.

On 9<sup>th</sup> of November 1916, Burdigala sailed from Toulon with final destination Thessalonica, filled with reinforcement for the warfront of the Balcans and on 13<sup>th</sup> November it sailed to Toulon. Crossing the pass between Kea and Euboea, it was located at a distance of 2 miles from the bay of St. Nikolaos in Kea and then a loud explosion was heard, which happened due to a row of mines that submarine U73 had placed and it was sunk.

The shipwreck lies at a depth of 72 m., and has been preserved at an excellent state in an upright position. The visibility of waters is very good approaching 15 m. and as a result, the divers have a panoramic view of the shipwreck. Of real interest to the divers is the very well preserved foremast superstructure, which lies at a depth of 42 m., facing the port of Kea and is the shallowest part of the shipwreck. Furthermore, the anchor and the machine gun of the ship are fascinating.

Patris: in 1857, in Syros, a coastal shipping company with the name “Greek Steam Navigation” was founded for the connection of insular with continental Greece. In 1859, among others, in Charles Lungley & Co shipyards in Deptford of the Thames river, was ordered the paddle steamer King Otto, which was launched in 1860, with dimensions of 68.3 X 8.4. After Otto’s departure, the ship was renamed Patris and passed to the “Greek Steam Navigation”. Its last journey was on 23rd February 1868. Less than 1 mile outside Kea, it came against a storm. There was bad visibility, that’s why it crashed into Koundouros reef. Fortunately there were no human losses. The shipwreck is divided in two sections which lie at a depth from 30 to 55 m. The fact that one of the wheels of the ship still remains in situ makes diving in the shipwreck area fascinating.

## **Accessible Underwater Archaeological Sites**

### **Accessible Underwater Archaeological Site at Methony Bay - Sapienza Island (Peloponnese)**

In Methoni, near Sapienza Island, close to Spitha cape, there are two shipwrecks:

Shipwreck of columns: it lies at a depth of about 10 meters. Its columns are scattered in an area of around 30 square meters. A number of columns lie at the sea-bottom, next to each other, in the same way as they probably lied in the sunken ship, whereas other pieces are scattered at the sea-bottom. Thirty-four pieces of fragmented monolith non-fluted columns were located, of which only one is intact. The columns are made of reddish granite and it seems that they belonged to a building which was demolished or collapsed. The shipwreck dates to the 3rd century A.D.

“Sarcophagi” shipwreck: north of Sapienza island and in a relatively short distance from the shipwreck of columns, there is a second shipwreck at a depth of 15 m. Its cargo consists of stone sarcophagi with their coverings. This shipwreck also dates to the 3rd century A.D.

### **Accessible Underwater Archaeological Site at Navarino Bay (Peloponnese)**

On 23 February 1980, in Pylos an unbelievable history took place. Irene Serenade, a 300 meters long and 47 meters wide tanker, of Tsakos Company, carrying 120

thousand tons of crude oil from Turkey on its way to Europe was sunk in Pylos harbor. There was an explosion and it was sunk in flames at a depth of 47 meters.

#### **Accessible Underwater Archaeological Site at Pavlopetri (Lakonia)**

The first seabed museum was founded there, where the sunken prehistoric settlement lies. The visible parts of the settlements cover an underwater area of about 300m x 100m, at a depth of 2-4m. It is among the most ancient sunken cities of the world, since it was inhabited before 2800 BC, at the beginning of the Bronze Age.

#### **Accessible Underwater Archaeological Site at Alonissos and Northern Sporades (Sporades)**

A classical shipwreck was revealed in 1985 at a depth of 22-23 metres, on the west side of Peristera Island. It dates to the 5th century BC and it was carrying amphorae with wine from Mendi (a town in Chalkidiki) and Peparithos (contemporary Skopelos). It is an impressive site, due to the size of the shipwreck, which seems to have been a ship greatly larger than the common ones of its age.

#### **Accessible Underwater Archaeological Site being planned - Palaia Epidavros (Peloponnese)**

A sunken city lies at a depth of 1.5-2m. One can see the ancient military harbor and a villa dated in the Roman times.

#### **Accessible Underwater Archaeological Site at Thorikos and Lavreotiki (Attica)**

At the sea area of Makronisos – Lavreotiki, there are seven ancient shipwrecks, which are dated from the Late Classical to the Roman times.

#### **Accessible Underwater Archaeological Site at West Pagasetic sea area (Thessaly)**

Telegraphos Bay: An important shipwreck of late Roman amphorae was located and excavated (9 types of well-preserved amphorae are distinguished) which date the context of the shipwreck to the end of the 4th century AD. This shipwreck lies at a depth of 17 – 28 meters.

Shipwreck in Kikyinthos: Kikyinthos island extends as a natural breakwater East of Amaliapolis bay. The cargo pile lies at a depth ranging from 3.5 to 9 meters. The vast majority of pottery are fragments of large pithoi, but there are also parts of Byzantine commercial amphorae, which date the shipwreck to the 12<sup>th</sup> - 13<sup>th</sup> century AD.

Glaros cape: two shipwrecks of Byzantine Times were located here. They consist of clusters of amphorae, which are dated between the 12th and 13th century AD, while the dating is confirmed by two metallic anchors, Ypsilon shaped, which are characteristic of this period.

## **Greek legislative framework**

### **1. The general legislation on recreational diving**

In Greece recreational diving was forbidden across the board in 1978 and was permitted and regulated by law 3409/2005.

### **2. Spatial Planning Regulations**

The legislation in effect is 'General Hellenic Framework for Spatial Planning and Sustainable Development' (Decision of the Ministry of the Environment, Spatial Planning and Public Works - YPEHODE 6877/4872/2008, Government Gazette (GG) A 128/2008).

This law acts in combination with the 'Special Framework of Spatial Planning for Tourism' (Decision of the Ministry of the Environment, Spatial Planning and Public works - YPEHODE 24208/4-6-2009, GG 1138B/11-6-2009), which in article 6 E1.3 establishes the concept of diving tourism and its development through Diving Theme Parks with overall spatial planning and provision made for perimeter zones of restricted fishing.

The provisions of the aforementioned 'Special Framework of Spatial Planning for Tourism' support its promotion in order to enrich the tourism product in areas where tourism is developing and/or developed, by establishing organised diving theme parks.

Diving parks are designated as appropriately protected and managed marine habitats. Their development can be combined with the existence of protected marine parks and their operation can co-exist with scientific research carried out in the general area as well as with lower-environmental-impact forms of fishing.

Areas considered eligible for such development must have:

- a) the required resources (underwater geological formations and ecosystems with varied marine fauna; or others permitting enhancement in the number and size of species with appropriate measures; underwater wrecks; underwater antiquities, etc);
- b) easy access and
- c) a location that will require a maximum of 90 minutes travel to reach health infrastructures required to meet emergency needs linked to the sport (e.g. functioning hyperbaric chamber).

The legislation also promotes the construction of land facilities in support of the underwater activity (museums, aquariums, etc.) in areas near those where diving activities take place.

In brief, the aforementioned Special Spatial Planning Framework for Tourism sets out almost universal spatial planning for diving parks and this correctly, as this is an activity that does not harm but instead improves the environment, and which takes place in appropriate natural rather than man-made areas.

The more recent 2015 'Special Framework for Spatial Planning for Tourism' has not brought about any changes in the foregoing.

### **3. Legislation on Diving Parks (The Ephorate has no jurisdiction on Diving Parks)**

Diving Parks as an innovative institution were first proposed in Greece, and potentially also internationally, by article 13 of I. 3409/2005.

A more detailed presentation and documentation of the concept, the significance and reasoning behind Diving Parks as an innovative, sustainable developmental and environmental tool are set out in D. Markatos - K. Koutsis, *Diving Parks*, Perivallon & Dikaio (Environment & Justice), Vol. 2/2008 pp 237 *et seq.*

Additionally see: K. Koutsis, P. Christofyllogiannis and D. Markatos: *Socially Sustainable MPAs (SoS MPAs) and Marine Impact Trade (MIT)*, from the *Proceedings of the 10th International Conference on the Mediterranean Coastal Environment MEDCOAST 2011, Rhodes, October 2011, vol. 1, p. 271-282* (for the complete texts both in English and Greek, see [www.tridentstar.gr](http://www.tridentstar.gr)).

In the initial draft of article 13 of I. 3409/2005, Diving Parks were designated as Areas for Integrated Development as a Diving Park (POAKP) along the model of Areas for the Organised Development of Productive Activities (POAPD) designated under law 1650/1986, the precise manner for the establishment of which would be designated by Joint Ministerial Decision (JMD) of Ministry of the Environment, Spatial Planning and Public Works and the Ministry of Naval Affairs.

With its Decision 71277/17-9-2013 (Diavgeia Reference Number (ADA): BA920-N27) the Ministry for the Environment, Energy and Climate Change (YPEKA) made provision for a Committee to draft the JMD. After it was drawn to their attention by the document with YPEKA prot.no. 3879/24-1-2014 that Diving Parks do not constitute a production activity; and that instead of issuing a JMD for a POAKP, what was required was to undertake a fundamental legislative replacement of article 13, which was in fact legislated with article 10 of I. 4296/2014, which replaced article 13 of I. 3409/2005, and took on its current clear and detailed form with which it became practically feasible to establish and operate Diving Parks, without the requirement of any further legislation being issued.

In brief, the new article 13 of I. 3409/2005, as currently in effect, provides for:

Diving Park establishment / concession / projects: With JMD of the Ministers of Finance, National Defence, YPEKA, Rural Development and Food, Naval Affairs, the Aegean and Tourism without public tender. With or without shoreline / beach. The works shall be carried out on the basis of article 14 I. 2971/2001.

Definition of DP: Covering an area of up to 2 sq.km. Boundaries set with buoys. Compatible with NATURA. Used exclusively for recreational diving, related activities, environmental training, scientific research. Minimum distance 3 nautical miles from any official underwater archaeological site.

Prohibitions: On general water transport, anchoring (only mooring onto buoys), fishing, collection of organisms.

Permitted: The sinking of wrecks and in general the construction of man-made attractions.

Supporting documents: Presentation / agency documentation / adequate resources. Technical Report on the position, organisation, infrastructures, project works. Draft of Charter regulations. Environmental Impact Approval Decision.

Procedure: A File is submitted to the Directorate of Spatial Planning of the Ministry of the Environment, Energy and Climate Change. Within five days this is inspected to ensure it meets all formal requirements. Then it is immediately dispatched to all jointly competent bodies for formal opinions, which must be issued within 30 days. These are then evaluated within 10 days. A JMD announcing / providing the concession is drawn up within 15 days. JMD is published.

Criteria for concession: Directions of spatial planning policy; how planned park is compatible with / complements other local uses / activities, area characteristics; whether the requisite infrastructures exist; whether there are direct or indirect benefits for the environment, tourism, economy / population. Suitability of site, seabed, waters, existence of other nearby DPs, joint participation of Local Authority Organisations, Legal Entities under Public Law, professional associations. Separate policing by Coast Guard.

Rights / Obligations of body: Sole activity: Management of the DP, trading in relevant materials. Effective guarding with the right for self-sufficient protection. Ticket sales. Payment of remuneration / exchange to the State.

Penalties for infractions: Withdrawal of concession / announcement. Criminal and Administrative Charges pursuant to: articles 28-30 of l. 1650/1986 on the Protection of the Environment; article 157 of Legislative Decree 187/1973 the Code of Private Marine Law; article 15 of l. 3409/2005 on Recreational Diving; article 27 para. 7 of l. 2971/2001 on the Shoreline and Beach.

The unfortunate downside of article 13 of l. 3409/2005 as in effect was the aforementioned prohibition against establishing Diving Parks at a distance of fewer than 3 nautical miles from existing official underwater archaeological site.

This is a blatantly redundant and damaging regulation as, (a) in order for a diving park to be established, the Ministry of Culture must in any case publish its expert opinion; (b) contiguity to a diving park acts to protect underwater antiquities, as the site is

required to be guarded and only accompanied and therefore supervised dives are permitted to take place in the park; (c) any future discovery of underwater antiquities at a distance less than 3 nautical miles from an existing diving park would lead to its closure with the loss of the concomitant investment; and (d) this prohibition impedes the creation of tourist packages with multiple dives in a variety of diving parks and archaeological sites accessible to the public in the same region.

It is obvious that, in order to develop the institution of Diving Parks in Greece, which would be developmentally and environmentally beneficial, the aforementioned restriction must definitely be abolished (for detailed arguments see: D. Markatos, *Comments on article 10 of l. 4296/2014*, *Perivallon kai Dikaio* issue 70, 4/2014 October - December 2014, pp. 606-607).

In the meantime the only diving park that appears to be approaching completion and set to commence operations is that being set up by the Region of the Peloponnese in the area of Tyros Arkadia, which is at the stage of negotiations with the Ministry of Finance to set the financial remuneration it will pay for the concession of the marine area.

#### **4. Marine Protected Areas**

Marine Protected Areas were provided for, established and operate in Greece on the basis of institutional law 1650/1986 for the protection of the environment and particularly by articles 19 and 21 thereof.

Article 19 institutes the classification of environmentally protected areas (nature reserves) in general (both land and marine) and provides for the following:

**“Article 19. Criteria for classification and principles of protection”.**

“For the implementation of the present law:

1. As strict nature reserves shall be characterized expanses with exceptionally fragile ecosystems, habitats of rare or endangered species of the native flora or wild fauna or expanses that play a major role in the life cycle of rare species of wild fauna threatened with extinction. These areas shall be subject to strict protection by the competent services. In areas of strict nature preserves any form of activity shall be prohibited. Exceptions can be permitted in accordance with the specific regulations of the reserve’s management plan, to carry out scientific research so long as a high degree of protection is ensured; as well as to carry out such works as safeguard the maintenance of protected objects, species or habitats.

2. As Nature Reserves shall be characterized expanses of major ecological or biological significance. In these areas the natural environment shall be protected from every activity or intervention which may change or alter its natural condition, composition or evolution. Exceptions may be permitted, in accordance with the specific regulations of its management plan, for the execution of works which are judged necessary in order not to alter those features that ensure the preservation of the protected objects, scientific research and the exercise of mild occupations and activities, if these do not come into opposition with the goals of preservation. Nature preserve areas may be included in protected areas under paragraph 1.

3. a) As Natural parks shall be characterized such land, water or mixed nature areas, if they shall present particular significance and interest due to the quality and diversity of their natural and cultural features, particularly biological, ecological, geological, geomorphological and aesthetic features and, at the same time, offer significant opportunities to develop activities, which are in line with nature and landscape preservation. Natural parks shall be classified as national or regional and may be included under protected areas of paragraphs 1, 2, 4, and 5.

b) The purpose of classifying areas as natural parks shall be to preserve their natural heritage and biodiversity, as well as to preserve the ecological quality of broader regions of the country, while at the same time offering the public with the opportunity for environmental education and nature-loving activities.

c) When a natural park or a large portion thereof is a marine or forest area or includes geotopes of major significance, it can be specifically called a marine park, a national or regional forest park or geopark respectively.

d) In order to serve the aforementioned purposes, appropriate measures shall be taken and scientific research shall be carried out, so that these areas can be protected sufficiently both from natural causes of deterioration and from human actions and interventions which shall cause alterations in the preservation condition of the protected values.

e) Without prejudice to instance (f) and paragraph (8), in natural parks mild occupations and activities shall be permitted, such as are adapted to the natural environment and the local architecture, under the condition that these are set out in the act of characterisation and the management plan.

f) Within natural park, with the exception of segments thereof, which constitute areas under paragraphs 1 and 2, it shall be possible to permit quarrying and mining

activities, if these shall make a significant contribution to the local economy and shall not cause a deterioration of the environment incompatible to the nature of such areas.

g) In order for preservation and management of such areas that shall be clear and comprehensible to all their users, it shall be possible to make provision for delimiting protection zones within natural parks and to designate sufficient area of strict protection or nature protection (core). Designation of preservation and development zones on the periphery of the core, which shall be clearly delineated, that can be shown in a substantiated manner not to run counter to the goals of preservation of such areas, with increasing degree of preservation, shall always be carried out with the intention to provide integrated preservation of the protected ecological or other natural resources.

h) National forests which have been established pursuant to article 78 of legislative decree 86/1969 (GG 7A), as replaced by article 3 of l.d. 996/1971 (GG 192 A) and the wetlands of international significance according the Ramsar Convention, which was ratified by the first article of l.d. 191/1974 (GG 350A), shall be characterized as national parks with a presidential decree issued following a proposal by the Minister of the Environment, Energy and Climate Change in accordance with the procedure of article 21.

### **3.1 National parks**

Areas covering large expanses shall be characterized as national parks when, either due to their position, which may be cross-border, or due to their exceptional ecological or other natural importance, they are considered significant on a national level.

### **3.2 Regional parks**

a) Areas shall be characterized as regional parks when, either due to their position or their ecological significance they are considered to be significant on a regional level.

b) For peri-urban natural areas in particular which are characterized as regional parks, the major resource to be protected shall be designated to be the preservation of the ecosystem in a satisfactory condition, in order to provide ecological services, such as improving air quality, regulating climate and water cycles and providing recreational facilities to the inhabitants of urban centres. Such areas shall be able to be characterized as “quiet areas in the open country” in the sense of subpara. (l) of article 3 of Directive 2002/49/EC of the European Parliament and Council (L 189).

c) In agricultural areas of high natural value, which shall be characterized as regional parks, the major resource to be protected shall be designated to be the preservation of local strains and native phyla of agricultural animals, as well as structural elements of the agricultural landscape, such as hedges, uncultivated swathes on the boundaries of wild areas and islets of natural vegetation.

d) Regional parks may include settlements within peripheral zones of protected objects, which are designated as areas of ecocodevelopment. In these zones the exercise of mild and environmentally-friendly occupations or activities, such as recreation, nature tourism, integrated or organic farming, organic farming of water-borne organisms, fishing with clearly limited select tools, environmental and cultural education and the processing of local products, shall be supported with incentives.

4. a) As habitat / species management areas shall be characterized land, wetland or marine expanses, which shall be subject to management in order to ensure the satisfactory condition of preservation of protected habitats and species.

b) These shall be classified as Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Wildlife Refuges (WRs).

#### **4.1 Special Areas of Conservation**

a) Areas included in the list of sites of Community importance, which is set out in Annex 1 of Decision 2006/613/EC of the Commission (L 259), shall be deemed to be SACs with the present law and shall be appended as an annex to the present law (annex). Detailed and digitized maps of SACs shall be maintained on record and shall be made available to the public by the competent services of the Ministry of the Environment, Energy and Climate Change, and shall also be posted online.

b) Areas within this category can furthermore be included in any other classification of protection under the current article in accordance with the procedure set out. In such an instance steps must be taken to ensure that the delimitation, potential zoning and established regulations, prohibitions, terms and restrictions are in line with their protection goals.

#### **4.2 Special Protection Areas**

a) With the present law, the areas of the Greek Territory which have been classified as SPAs pursuant to article 4 of Directive 2009/147/EC (L20) and which are included in annexes B and Γ of article 14 of the joint ministerial decision of the Ministers for Finance; the Economy; Competitiveness and Marine Affairs; the Environment, Energy

and Climate Change, H.Π. 37338/1807/E. 103/1.9.2010 (GG 1495 B), shall constitute part of the Natura 2000 network of protected areas.

By joint decision of the Minister of the Environment, Energy and Climate Change and the jointly competent ministers in each instance, this list shall be amended to include any new SPAs, pursuant to the procedure set out in article 4 of the j.m.d. 37338/1807/E. 103/1.9.2010 (GG 1495 B). Without prejudice to the provisions of I. 3882/2010 (GG 166 A), detailed and digitized maps of SPAs shall be maintained on record and shall be made available to the public by the competent services of the Ministry of the Environment, Energy and Climate Change. These maps shall also be posted online.

b) SPAs shall further be able to be included in any other protection classification pursuant to the process set out in the present article. In such an instance steps shall be taken to safeguard that the delimitation, the zoning and the regulations, prohibitions, terms and restrictions instituted on the protected areas are in line with their protection goals.

c) Should the requirements of instance (b) have not been met, it is possible to designate specific terms and restrictions on construction, land usage, as well as on any other issue that concerns the protection and ecological management of the SPA through presidential decrees issued on a proposal by the Minister of the Environment, Energy and Climate Change, implementing a special report.

d) In the instance of SPAs that come under the jurisdiction of a management agency pursuant to article 15 of I. 2742/1999, as amended by article 7 of the present, the management agency in question shall coordinate the scientific research programmes and the procedures for carrying out the management plans as set out in paragraph 5 of article 18 for the SPAs under its jurisdiction.

#### **4.3 Wildlife refuges**

a) Natural areas (land, wetlands, or marine areas) which have special importance as important sites for the growth of wild flora or as habitats for the reproduction, feeding, overwintering of species wild fauna, or as spawning grounds for fish and nursery grounds for juvenile fish, or, finally, as major marine habitats, shall be characterized as wildlife refuges. Ecological corridors between other categories of protected areas under paragraphs 1, 2, 3, 4, and 5 shall also be able to be characterized as wildlife refuges.

b) Hunting shall be prohibited within wildlife refuges; as shall dog trials for hunting and pointer dogs; trapping wild animals; collecting wild flora; destroying zones with natural vegetation in any manner; destroying hedgerows; removing sand; water drainage; land-filling and draining bogs; polluting water systems; waste dumping or disposal; carrying out military exercises; fish-farming activities; as well as including expanses of the wildlife refuge in a city or town plan. Wild animal observation posts can be established. Quarrying and mining activities as well as road building are permitted, after these have gained an environmental permit pursuant to the provisions of I. 4014/2011 (A 209), as in effect.

\*\*\* Instance b was replaced as above by article 59 L. 4315/2014, GG A 269/24-12-2014.

c) In Wildlife Refuges, the services that are competent in each instance can approve or schedule and carry out special works to improve the habitat and works to meet the ecological requirements of the biological cycle of the species of wild fauna and native flora and particularly reforestation, preservation of uncultivated expanses of land, preservation of expanses with local strains, preservation of hedgerows, reclamation and improvement works on wetlands expanses, creation and development of zones of natural vegetation, planting of rows of trees along rural roads and marsh expanses. These projects shall be described in special management studies, which shall be approved by the General Secretary of the local Decentralised Administration. The requirements for drawing these up shall be designated by a decision of the Minister of the Environment, Energy and Climate Change.

5. a) Areas of great ecological, geological, aesthetic or cultural value and expanses which are particularly well suited for public recreation or which contribute to the protection of natural resources due to particular natural or man-made features shall be characterized as Protected Landscapes / Seascapes. Protected landscapes / seascapes may be given more specific names, depending on their dominant features, such as aesthetic forest, geopark, wild natural landscape, rural landscape, urban landscape. Those segments or component elements of the landscape which have a particular ecological, aesthetic or cultural value or which contribute to the protection of natural resources due to their particular natural or land-made features, such as groves, traditional crop cultivation, farm houses, paths, stone fences, dry stone walls and terraces, spring fountains shall be characterised as Protected natural elements.

b) Protected natural formations shall be those functional portions of nature or individual creations thereof, which have particular scientific, ecological, geological, geomorphological or aesthetic value, or contribute to the preservation of the natural

processes and the protection of natural resources, such as trees, rows of trees and hedges, protected marine vegetation, riparian and coastal vegetation, natural fences, waterfalls, water sources, canyons, dunes, reefs, caves, rocks, petrified forests, trees or portions thereof, palaeontological finds, coral geomorphological formations, geotopes and ecotopes prioritising those that are of Community interest. Protected natural formations, which are monumental in nature, are characterised specifically as Protected natural monuments. Actions or activities that could bring about the destruction, damage or otherwise alteration of the protected natural formations, just as in the case of protected landscapes or partial portions thereof, are prohibited, pursuant to the specific protection regulations set out in the characterization decision.

c) Landscapes that have been proclaimed to be aesthetic forests, as peri-urban forests, as protected forests and as listed natural monuments, shall come the corresponding classification pursuant to the present. For landmarks of outstanding natural beauty that have already been proclaimed as such, the terms under which they are included shall be decided by the Minister of the Environment, Energy and Climate Change.

6. Areas of instances 1 and 2 may be surrounded by a perimeter / regulatory protection zone of sufficient expanse, so that the terms and restrictions can be stepped up in order to better safeguard the protected object.

7. In the areas under paragraphs 1, 2 and 3.1 it is not permitted to plan for Areas of Integrated Tourism Development.

8. In areas: (a) under paragraphs 3, 4, 5 and 6, with prejudice for those segments that constitute areas under paragraphs 1 and 2 of RAMSAR wetlands of international significance and priority habitats of areas of Greece included in the Natura 2000 network, in accordance with decision 2006/613/EC of the Commission; as well as (b) in neighbouring expanses under paragraph 4 of article 3, it is permitted to establish stations for renewable energy sources as a means to protect the environment, if under the terms and prerequisites which are set out within the framework of the approval of environmental terms for the station the preservation of the object that must be protected in the area is safeguarded.”

\*\*\* Article 19 was replaced as above by article 5 L. 3937/2011, GG A 60/31.3.2011

Article 21 of L. 1650/1986 establishes the procedure to create protected areas and the following are set out:

## **Article 21**

### **Characterisation of areas, elements or groupings of nature and the landscape.**

“1. a) The characterization of protected areas 1, 2 and 3.1 under article 19, as well as the delimitation and the designation of land usages and activities within these takes place by presidential decree, issued following a proposal by the Minister of the Environment, Energy and Climate Change, subsequent to an opinion issued by the “Natura 2000 Committee” and the General Secretary of the local Decentralised Administration, in implementation of a special environmental study (SES). The commission to draw up a SES and final approval thereof is carried out by decision of the Minister of the Environment, Energy and Climate Change.

b) For the characterization of an area as a regional park, its delimitation and the designation of the terms of construction, land usage and activities therein, a presidential decree is issued following a proposal put forward by the Minister for the Environment, Energy and Climate Change, subsequent to the opinion of the “Natura 2000 Committee” and the General Secretary of the local Decentralised Administration, on the basis of a special report, which documents the ecological significance and its valued objects that must be protected. Specifically for the characterisation of agricultural areas of outstanding natural beauty as regional parks, the presidential decree is issued following a proposal by the Minister of Agricultural Development and Food, and the Minister of the Environment, Energy and Climate Change. Specifically in order to characterise marine areas as regional parks, the presidential decree is published upon the proposal of the Minister of Marine Affairs, Island Affairs and the Minister of the Environment, Energy and Climate Change.

c) Specifically the characterization and delimitation of the boundaries and protection zones for areas, elements or groupings of nature or the landscape, which are included in a Zone of housing control (ZOC), is carried out by an act designating the ZOC and in the procedure set out in article 29 of l. 1337/1983 (GG 33 A).”

“The provisions of the acts for the designation of ZOCs which were issued or shall be issued pursuant to the procedure of the preceding subparagraph, prevail over any directions or frameworks of spatial planning that are included in other provisions, which concern the use of land, the terms and restrictions on construction and the restrictions on subdividing plots of land or the minimum requirements of land area in order to build.”

\*\*\* The final subparagraph of par. 1 was added with article 16 par. 3 of l. 4164/2013, GG A 156/9.7.2013.

2. In order to characterise an area as a wildlife refuge, a decision shall be published by the General Secretary of the competent Decentralised Administration, based on a special report which documents the ecological or other natural value of the area.

The act of characterization designates the conservation priorities for each area. In areas where an airport is in operation, in order to characterise and delimit such areas the concurrent opinion of the Civil Aviation Service is required. De-characterisation or a decrease in the expanse of the protected area shall be permitted by decision of the Minister of the Environment, Energy and Climate Change and the jointly-competent Minister in each instance after the General Secretary of the local Decentralised Administration has issued a substantiated opinion.

3. In order to characterise an area as a protected landscape or seascape or as a protected natural formation, a decision shall be issued by the General Secretary of the Decentralised Administration on the basis of a special report, which shall document the ecological or other natural value of the object that must be protected and the opinion of the elected Head of Region in question. The act of characterization shall designate the conservation priorities. De-characterisation or a decrease in the expanse of the protected object shall be permitted by decision of the Minister of the Environment, Energy and Climate Change and the jointly-competent Minister in each instance after the General Secretary of the local Decentralised Administration has issued a substantiated opinion.

4. Decisions of the Minister of the Environment, Energy and Climate Change shall be required to specify the general and special measures set out in articles 5 and 6 of the European Landscape Convention, which was ratified by I. 3827/2010 (GG 30A).

Specifically, pursuant to para. E of article 6 of I. 3827/2010, when dealing with general terms and restrictions, these are instituted by presidential decrees following a proposal put forth by the Minister for the Environment, Energy and Climate Change. In this instance, the characterisation of an area as a protected landscape or seascape or as a protected natural formation may take place with the same decree.

5. a) Regulatory acts for the characterization of protected areas which were approved by a body that is not competent, may be approved by presidential decrees as is, without prejudice for adherence to provisions of paragraph 2 of article 9, following a proposal put forth by the Minister for the Environment, Energy and Climate Change and the jointly competent Ministers and after a suggestion by the General Directorate for the Environment that no particularly significant changes have been brought about to the preservation condition of the object to be protected. The effect of the

aforementioned presidential decrees, beyond adherence to the provisions of paragraph 2 article 9, shall extend to the date of publication of the first administrative acts, which shall be explicitly abolished with the same presidential decrees.

b) Should special environmental studies for areas under paragraphs 1, 2, and 3 of article 19 have been approved by the General Directorate of the Environment of the Ministry of the Environment, Energy and Climate Change before the publication of the present law, the presidential decrees under instance a of paragraph 1 shall be issued in implementation of these studies within two years.

c) Up to the publication of the presidential decrees of the foregoing subparagraph, the content of the approved special environmental studies must mandatorily be taken into consideration in the spatial planning of any project or activity within the protection area.

d) Presidential decrees for the protection of areas, plans for which are transmitted within six months from the publication of the present to the Council of State for processing in accordance with the law, shall be subject to provisions previously in effect as to the conditions of their publication.

6. The process for drawing up and approval, as well as the conditions of the special environmental studies and the special reports shall be designated by decision of the Minister of the Environment, Energy and Climate Change.

7. The draft presidential decrees for acts of characterization under paragraph 1 shall be announced before their final formulation to the competent Local Government Organisations and shall be required to be subjected to public consultation for a period of one month, at the free-access internet portal of the Ministry of the Environment, Energy and Climate Change. Interested citizens, competent public services and agencies have the opportunity within the specified period of time to express their opinion in writing. In areas where a civil airport is operating the assent of the Civil Aviation Service is required.

8. In the instance that implementation of the provisions of the present law concerns areas of interest to the Ministry of National Defence and the legal entities overseen by that Ministry, which include military infrastructure and facilities utilized for the purposes of national defence and security, the Assent of the Ministry of National Defence is required.

9. For areas, elements or nature and landscape or seascape groupings, for which the process of characterization by presidential decree is commencing and until the publication of the act of characterization shall be published, the Minister for the Environment, Energy and Climate Change can designate the terms and restrictions on interventions and activities that may potentially have a harmful effect upon the aforementioned areas, elements or groups by a decision published in the Government Gazette. The validity of this decision shall extend for a period of no more than two years. In the event of exceptional circumstances, this deadline may be extended by a similar ministerial decision for one further year.”

\*\*\* Article 21 was replaced as above by article 6 L.3937/2011, GG A 60/31.3.2011.

\*\*\* NOTE: See also L.3986/2011 (article 10 *et seq.*), GG A 152/1.7.2011, where paragraphs A2 and A3 of article 11 mandate that:

"2. Δεν επιτρέπεται η αξιοποίηση δημοσίων ακινήτων, τα οποία εμπίπτουν στο σύνολο τους σε οικότοπους προτεραιότητας, σε περιοχές απόλυτης προστασίας της φύσης και προστασίας της φύσης που καθορίζονται κατά τις διατάξεις των άρθρων 19 παράγραφοι 1 και 2 και 21 του ν. 1650/1986 (Α` 160), όπως ισχύει, σε πυρήνες εθνικών δρυμών, σε διατηρητέα μνημεία της φύσης, σε εθνικά πάρκα και σε υγρά τοπικούς διεθνούς σημασίας.

"2. No development shall be permitted of real estate that belongs to the state that falls in its entirety in priority habitats, in areas of Strict Nature Reserves and Nature Reserves designated pursuant to the provisions of articles 19 paragraphs 1 and 2 and 21 of L. 1650/1986 (A 160), as in effect, in the cores of national forests, in listed natural monuments, in national parks and in wetlands of national significance.

3. The development of real estate that belongs to the State, which includes areas protected by the current environmental and archaeological legislation due to their special nature, such as particularly zones for the protection of archaeological sites, historical sites, natural parks and areas of eco-development, shall be carried out in accordance with the special terms and restrictions set out in the relevant provisions of laws 998/1979, 1650/1986, and 3028/2002, as in effect.”

5. In accordance with the foregoing provisions the following have been established and are operational in Greece today:

6. (a) The National Marine Park of Alonnisos for the protection of the Mediterranean seal (MD 235/2003, GG 621/19-6-2003) and

7. (b) The National Marine Park of Zakynthos / the Strofades for the protection of the sea turtle *Caretta caretta* (PD 22/1999, GG Δ 906/22-12-1999, as this was amended by PD 27/2003, GG Δ1272/27-11-2003).

## Specific legislation related to Accessible Underwater Archaeological Sites

**Foundation of Underwater Accessible Archaeological Sites at the sea areas of Alonnisos Island and West Pagasetic: the legislation is published on the Official Government Gazette, Volume 2, Number 119, 21st of January 2015**

The Foundation of Underwater Accessible Archaeological Sites is approved and the terms and conditions for their operation and the allowed activities within these sites are defined at the sea areas of Sporades Islands and West Pagasetic, Regional Unity of Magnesia, Region of Thessaly, as follows:

Article 1, Accessible underwater archaeological sites

1. The following declared underwater archaeological sites are characterized as accessible by the public in order to conduct underwater survey:

(A) The part of the declared and redefined according to protocol number ΥΠΠΟΤ/ΓΔΑΠΚ/ΑΡΧ/Α1/Φ43/60806/2748/23.6.2011 ministerial decision (B' 1741) and the correction of error (B' 1702) underwater archaeological site of North Sporades – Alonnisos, near to Peristera Island, Municipality of Almiros (Alonnisos) which is defined by the following coordinates:

A X=494553.69            Y=4336546.24            Z=0.00

B X=494271.33            Y=4336447.15            Z=0.00

Γ X=494516.63            Y=4335894.15            Z=0.00

Δ X=494792.04            Y=4335991.80            Z=0.00

(B) The declared underwater archaeological site of Kikynthos Island at the sea area of the West Pagasetic, Municipality of Almiros (Alonnisos), as defined according to protocol number ΥΠΠΟΤ/ΓΔΑΠΚ/ΔΒΜΑ/ΤΑΧΜ ΑΕ/205960/121049/7214/2553/6.8.2014 ministerial decision (ΑΑΠ 270).

(C) The declared underwater archaeological site at the eastern boundaries of the small bay Telegrafos, Sourpi area, Municipality of Almiros (Alonnisos) which is defined by the points K, Λ, Μ, Ν, coastline and Κ, as they appear at protocol number ΥΠΠΟ/ΓΔΑΠΚ/ΑΡΧ/ΑΙ/Φ43/46243/3078/21.6.2004 ministerial decision (B' 1028) and correction of error (B' 1135).

(D) The declared and redefined underwater archaeological site at the position «Akra Glaros» at the marine area of West Pagasetic, Municipality of Almiros Alonnisos, which is defined according to protocol number ΥΠΠΟ/ΓΔΑΠΚ/ΑΡΧ/ΑΙ/Φ43/46243/3078/21.6.2004 ministerial decision (B'1028) and correction of error (B' 1135) and according to protocol number

ΥΠΠΟΑ/ΓΔΑΠΚ/ΔΒΜΑ/ΤΑΧΜΑΕ/205962/121051/7215/2554/6.8.2014 ministerial decision (ΑΑΠ 270).

2. The above accessible underwater archaeological sites operate as «underwater museums», according to paragraph 1 of article 11 of the Law 3409/2005, as it applies and which refers to «Recreational Diving and other provisions» (Α' 273).

3. Their management and the jurisdiction of conceding rights on them belongs to the Ministry of Culture and Sports, according to the opinion of the competent board. Especially on the case of the underwater museum of the position (Α) of this article, it is noted that its management, on behalf of the Ministry of Culture and Sports, must be done according to what is defined at protocol number 23537/6.5.2003 mutual ministerial decision of Ministers of Development and Competitiveness, of Rural Development and Food, of Shipping and Island Policy and the Undersecretary of Ministry of Environment, Energy and Climate Change «Characterization of the land and sea area of North Sporades as National Water Park» (Δ' 621), the Management Plan, the Regulation of Operation and the other provisions governing the National Water Park of Alonnisos North Sporades.

#### Article 2, Allowed activities

1. At the accessible underwater archaeological sites of the previous article the following are allowed: accompanied diving in order for the visitors to survey the sea bottom with or without using self-contained breathing apparatus and reaching the depth of 40 meters maximum, taking amateur photographs in the framework of guided diving, conducting survey of the seabed using clear bottom boats according to terms and conditions of the current legislation, as well as conducting all kinds of archaeological research/conservation work, for which the decision of the Minister of Culture and Sports is needed, after the opinion of the competent board.

2. The supervision of the visits at the above underwater archaeological sites, including the accompaniment by divers guards of antiquities or divers archaeologists, in the framework of accompanied diving, belongs to the Ephorate of Underwater Antiquities, of the Ministry of Culture and Sports.

#### Article 3, Conditions of guided diving

1. Tours of underwater surveys at accessible underwater archaeological sites will be done from and towards preselected and properly protected points of land for the departure and arrival of the boats, where there will be a guard room which will house the control staff. This staff, in the framework of its responsibilities, can control any visitor or his/her equipment and any baggage he or she carries, during the arrival of the visitors and their return from the surveys conducted at the accessible underwater archaeological sites.

2. During the conduct of the tours it is forbidden for the boats that carry the visitors to approach any other point of land, besides the guarded point of land for the departure and arrival of the boats.

3. The guided diving of the visitors at the above underwater archaeological sites is conducted by providers of diving services for organized-guided diving, with the accompaniment of divers guards of antiquities or divers archaeologists, who have been checked and are authorized by the Ephorate of Underwater Antiquities, according to legal procedures and have not been convicted for criminal offences or the felony of antiquity smuggling.

Article 4, Not allowed activities. Exceptions.

At the accessible underwater archaeological sites of the article 1 of the current provision is not allowed:

a) Any intervention at the sea bottom and at the existing objects that are there generally. On the contrary, it is possible to mark and arrange underwater roots in order to promote underwater attractions, to immerse mooring buoys for the boats that legally enter the accessible underwater archaeological sites and to immerse beacon markers or luminous beacons, with the approval and the supervision of the Ephorate of Underwater Antiquities, as well as the approval of the other Services that are also in charge, according to the current legislation.

b) Any form of fishing or other underwater activity as it is provided at protocol number ΥΠΠΟ/ΓΔΑΠΚ/ΑΡΧ/Α1/Φ41/11228/1865/9.2.2004 mutual ministerial decision (B'336), except the visits for underwater surveys and the scientific research as they are mentioned at the article 2 paragraph 1 and in the case (A) of the present article, while the ability to visit the specific underwater archaeological site will be temporarily interrupted during the conduct of underwater excavation.

c) Anchoring, except fastening to permanent mooring buoys, which will be placed at specific points of the diving roots.

Article 5, Violations

Those who violate the current provision fulfil the constituent element and are punished, as provided for in the article 66 of the Law 3028/2002. Moreover, penalties of the article 157 of the Codex of Public Maritime Law will also be imposed to them (v.δ. 187/1973).

Article 6, Training opportunity for program contracts for cultural growth

The right to conduct works and development programs, within the accessible underwater archaeological sites of the article 1 of the current provision, as well as matters of organization, management, supervision and exploitation of the allowed activities at these sites and any other necessary detail, in compliance with the

adjustments of the previous articles, can be object of the program contracts for cultural growth in compliance with paragraph 5 of the article 100 of the Law 3852/2010 (A' 87) and paragraph 1 of article 11 of the Law 3409/2005, as it was completed with paragraph 1 of the article 44 of the Law 4179/2013 (A' 175).

#### Article 7, Entry into force

The current provision entries into force from the moment it will be published on the Official Government Gazette.

This decision it to be published on the Official Government Gazette. Athens, 19th of January of 2015

### **Foundation of Underwater Accessible Archaeological Sites at the areas of Navarino bay and Sapienza Island, Municipality of Pylos-Nestor: the legislation is published on the Official Government Gazette, Volume 2, Number 2489, 3rd of October 2013**

The Foundation of Underwater Accessible Archaeological Sites is approved and the terms and conditions for their operation and the allowed activities within these sites are defined at the sea areas of Methoni and the declared archaeological site of Navarino Bay, Municipality Pylos-Nestor, Region of Peloponnese, as follows:

#### Article 1, Accessible underwater archaeological sites

1. The following declared underwater archaeological sites are characterized as accessible by the public in order to conduct underwater survey:

(A) The sea area within the declared underwater archaeological site of Navarino Bay (protocol number 15794/19-12-1961 Ministerial Decision) (B' 35), which includes the tanker Irene Serenade shipwreck ( $\phi$ : 36°55' 95'' B and  $\lambda$ : 21° 40' 60'' A) and a width zone of 150 meters around it.

(B) The declared underwater archaeological site near Sapienza Island at Akra Spitha, as defined according to protocol number ΥΠΠΟ/ΑΡΧ/Α1/Φ43/28260/1725/30-9-1998 Ministerial Decision (B' 1182).

2. The above accessible underwater archaeological sites operate as «underwater museums», according to paragraph 1 of article 11 of the Law 3409/2005, as it applies and which refers to «Recreational Diving and other provisions» (A' 273).

3. Their management and the jurisdiction of conceding rights on them belongs to the Ministry of Culture and Sports, according to the opinion of the competent board.

#### Article 2, Allowed activities

1. At the accessible underwater archaeological sites of the previous article the following are allowed: accompanied diving in order for the visitors to survey the sea bottom with or without using self-contained breathing apparatus and reaching the

depth of 40 meters maximum, taking amateur photographs in the framework of guided diving, conducting survey of the seabed using clear bottom boats according to terms and conditions of the current legislation, as well as conducting all kinds of archaeological research/conservation work, for which the decision of the Minister of Culture and Sports is needed, after the opinion of the competent board.

2. The supervision of the visits at the above underwater archaeological sites, including the accompaniment by divers guards of antiquities or divers archaeologists, in the framework of accompanied diving, belongs to the Ephorate of Underwater Antiquities, of the Ministry of Culture and Sports.

#### Article 3, Conditions of guided diving

1. Tours of underwater surveys at accessible underwater archaeological sites will be done from and towards preselected and properly protected points of land for the departure and arrival of the boats, where there will be a guard room which will house the control staff. This staff, in the framework of its responsibilities, can control any visitor or his/her equipment and any baggage he or she carries, during the arrival of the visitors and their return from the surveys conducted at the accessible underwater archaeological sites.

2. During the conduct of the tours it is forbidden for the boats that carry the visitors to approach any other point of land, besides the guarded point of land for the departure and arrival of the boats.

3. The guided diving of the visitors at the above underwater archaeological sites is conducted by providers of diving services for organized-guided diving, with the accompaniment of divers guards of antiquities or divers archaeologists, who have been checked and are authorized by the Ephorate of Underwater Antiquities, according to legal procedures and have not been convicted for criminal offences or the felony of antiquity smuggling.

#### Article 4, Not allowed activities. Exceptions.

At the accessible underwater archaeological sites of the article 1 of the current provision is not allowed:

a) Any intervention at the sea bottom and at the existing objects that are there generally. On the contrary, it is possible to mark and arrange underwater roots in order to promote underwater attractions, to immerse mooring buoys for the boats that legally enter the accessible underwater archaeological sites and to immerse beacon markers or luminous beacons, with the approval and the supervision of the Ephorate of Underwater Antiquities, as well as the approval of the other Services that are also in charge, according to the current legislation.

b) Any form of fishing or other underwater activity as it is provided at protocol number ΥΠΠΟ/ΓΔΑΠΚ/ΑΡΧ/Α1/Φ41/11228/1865/9.2.2004 mutual ministerial decision (B'336), except the visits for underwater surveys and the scientific research as they are mentioned at the article 2 paragraph 1 and in the case (A) of the present article, while the ability to visit the specific underwater archaeological site will be temporarily interrupted during the conduct of underwater excavation.

c) Anchoring, except fastening to permanent mooring buoys, which will be placed at specific points of the diving roots.

#### Article 5, Violations

Those who violate the current provision fulfil the constituent element and are punished, as provided for in the article 66 of the Law 3028/2002. Moreover, penalties of the article 157 of the Codex of Public Maritime Law will also be imposed to them (v.δ. 187/1973).

#### Article 6, Training opportunity for program contracts for cultural growth

The right to conduct works and development programs, within the accessible underwater archaeological sites of the article 1 of the current provision, as well as matters of organization, management, supervision and exploitation of the allowed activities at these sites and any other necessary detail, in compliance with the adjustments of the previous articles, can be object of the program contracts for cultural growth in compliance with paragraph 5 of the article 100 of the Law 3852/2010 (A' 87) and paragraph 1 of article 11 of the Law 3409/2005, as it was completed with paragraph 1 of the article 44 of the Law 4179/2013 (A' 175).

#### Article 7, Entry into force

The current provision entries into force from the moment it will be published on the Official Government Gazette.

This decision it to be published on the Official Government Gazette. Athens, 30<sup>th</sup> of September 2013

### **Foundation of Underwater Accessible Archaeological Sites at the sea areas of Lavreotiki – Makronisos: legislation published on the Official Government Gazette, Volume 2, Number 2655, 9<sup>th</sup> of December 2015**

The Foundation of Underwater Accessible Archaeological Sites is approved and the terms and conditions for their operation and the allowed activities within these sites are defined at the sea areas of Lavreotiki – Makronisos, Regional Unity of Attica, as follows:

## Article 1, Accessible underwater archaeological sites

1. The following declared underwater archaeological sites are characterized as accessible by the public in order to conduct underwater survey:

(A) The declared underwater archaeological site at the sea area of the bay Bathi Aulaki, according to protocol number ΥΠΟΠΑΙΘ/ΓΔΑΠΚ/ΔΙΠΚΑ/ΤΠΚΑΧΜΑΕ/Φ17/249071/146515/12446/3591/15-09-2015 Ministerial Decision (Φ.Ε.Κ. 2069/Β'/2015),

(B) The declared underwater archaeological site at the sea area of Kentron cape, at Makronisos Island, according to protocol number ΥΠΟΠΑΙΘ/ΓΔΑΠΚ/ΔΙΠΚΑ/ΤΠΚΑΧΜΑΕ/Φ17/249071/146515/12446/3591/15-09-2015 Ministerial Decision (Φ.Ε.Κ. 2069/Β'/2015).

(C) The declared underwater archaeological site at the sea area around Trypiti reef, at Makronisos Island, within 0.4 nautical miles and after having taken all the protective measures, according to protocol number ΥΠΟΠΑΙΘ/ΓΔΑΠΚ/ΔΙΠΚΑ/ΤΠΚΑΧΜΑΕ/Φ17/249071/146515/12446/3591/15-09-2015 Ministerial Decision (Φ.Ε.Κ. 2069/Β'/2015).

(D) The declared underwater archaeological site at the sea area of Gaidouromandra Bay, Lavrio, according to protocol number ΥΠΟΠΑΙΘ/ΓΔΑΠΚ/ΔΙΠΚΑ/ΤΠΚΑΧΜΑΕ/Φ17/249071/146515/12446/3591/15-09-2015 Ministerial Decision (Φ.Ε.Κ. 2069/Β'/2015).

(E) The declared underwater archaeological site at the sea area of Tourkolimano bay, Daskaleio Keratea, according to protocol number ΥΠΟΠΑΙΘ/ΓΔΑΠΚ/ΔΙΠΚΑ/ΤΠΚΑΧΜΑΕ/Φ17/249071/146515/12446/3591/15-09-2015 Ministerial Decision (Φ.Ε.Κ. 2069/Β'/2015).

(F) The points A' and B' of the declared underwater archaeological site at the sea area of Tourkolimano bay, Thorikos, at South Euvoikos, which are defined by the polygonal lines that pass through the points 1,2,3,4,5, coastline and 6,7,8,9, coastline, 6, respectively, as they are noted at the excerpt paper Γ.Υ.Σ. 6478/4 (ΠΛΑΚΑ), of scale 1:5.000, which is attached to the present decision, according to protocol number ΥΠΟΠΑΙΘ/ΓΔΑΠΚ/ΔΙΠΚΑ/ΤΠΚΑΧΜΑΕ/Φ17/249071/146515/12446/3591/15-09-2015 Ministerial Decision (Φ.Ε.Κ. 2069/Β'/2015).

2. The above accessible underwater archaeological sites operate as «underwater museums», according to paragraph 1 of article 11 of the Law 3409/2005, as it applies and which refers to «Recreational Diving and other provisions» (Α' 273).

3. Their management and the jurisdiction of conceding rights on them belongs to the Ministry of Culture and Sports, according to the opinion of the competent board.

## Article 2, Allowed activities

1. At the accessible underwater archaeological sites of the previous article the following are allowed: accompanied diving in order for the visitors to survey the sea bottom with or without using self-contained breathing apparatus and reaching the depth of 40 meters maximum, taking amateur photographs in the framework of guided diving, conducting survey of the seabed using clear bottom boats according to terms and conditions of the current legislation, as well as conducting all kinds of archaeological research/conservation work, for which the decision of the Minister of Culture and Sports is needed, after the opinion of the competent board.
2. The supervision of the visits at the above underwater archaeological sites, including the accompaniment by divers guards of antiquities or divers archaeologists, in the framework of accompanied diving, belongs to the Ephorate of Underwater Antiquities, of the Ministry of Culture and Sports.

#### Article 3, Conditions of guided diving

1. Tours of underwater surveys at accessible underwater archaeological sites will be done from and towards preselected and properly protected points of land for the departure and arrival of the boats, where there will be a guard room which will house the control staff. This staff, in the framework of its responsibilities, can control any visitor or his/her equipment and any baggage he or she carries, during the arrival of the visitors and their return from the surveys conducted at the accessible underwater archaeological sites.
2. During the conduct of the tours it is forbidden for the boats that carry the visitors to approach any other point of land, besides the guarded point of land for the departure and arrival of the boats.
3. The guided diving of the visitors at the above underwater archaeological sites is conducted by providers of diving services for organized-guided diving, with the accompaniment of divers guards of antiquities or divers archaeologists, who have been checked and are authorized by the Ephorate of Underwater Antiquities, according to legal procedures and have not been convicted for criminal offences or the felony of antiquity smuggling.

#### Article 4, Not allowed activities. Exceptions.

At the accessible underwater archaeological sites of the article 1 of the current provision is not allowed:

- a) Any intervention at the sea bottom and at the existing objects that are there generally. On the contrary, it is possible to mark and arrange underwater roots in order to promote underwater attractions, to immerse mooring buoys for the boats that legally enter the accessible underwater archaeological sites and to immerse beacon markers or luminous beacons, with the approval and the supervision of the

Ephorate of Underwater Antiquities, as well as the approval of the other Services that are also in charge, according to the current legislation.

b) Any form of fishing or other underwater activity as it is provided at protocol number ΥΠΠΟ/ΓΔΑΠΚ/ΑΡΧ/Α1/Φ41/11228/1865/9.2.2004 mutual ministerial decision (B'336), except the visits for underwater surveys and the scientific research as they are mentioned at the article 2 paragraph 1 and in the case (A) of the present article, while the ability to visit the specific underwater archaeological site will be temporarily interrupted during the conduct of underwater excavation.

c) Anchoring, except fastening to permanent mooring buoys, which will be placed at specific points of the diving roots.

#### Article 5, Violations

Those who violate the current provision fulfil the constituent element and are punished, as provided for in the article 66 of the Law 3028/2002. Moreover, penalties of the article 157 of the Codex of Public Maritime Law will also be imposed to them (v.δ. 187/1973).

#### Article 6, Training opportunity for program contracts for cultural growth

The right to conduct works and development programs, within the accessible underwater archaeological sites of the article 1 of the current provision, as well as matters of organization, management, supervision and exploitation of the allowed activities at these sites and any other necessary detail, in compliance with the adjustments of the previous articles, can be object of the program contracts for cultural growth in compliance with paragraph 5 of the article 100 of the Law 3852/2010 (A' 87) and paragraph 1 of article 11 of the Law 3409/2005, as it was completed with paragraph 1 of the article 44 of the Law 4179/2013 (A' 175).

#### Article 7, Entry into force

The current provision entries into force from the moment it will be published on the Official Government Gazette. Athens, 4th of December 2015.

## CYPRUS

Concerning Cyprus, there are currently no Underwater Museums, or Diving Parks. However, there are several ancient shipwrecks and modern shipwrecks that attract divers and enrich marine biodiversity. Further, divers find interesting spots within Marine Natura 2000 sites designated across the island as well as in designated Marine Protected Areas with artificial reefs.



Figure 10: map of Cyprus

### Analysis of Underwater Museums and Diving Parks

As it was mentioned above, there are currently no Underwater Museums and Diving Parks in Cyprus. However, the Municipality of Ayia Napa, in Famagusta region, made an announcement on August 2014, regarding the opening of the first Underwater Art Museum of Cyprus, in the region of Pernera, in Ayia Napa (<http://www.ayianapa.org.cy/press-release.php?id=53&lang=en>). The initial plans were to open the museum during the summer of 2015, but due to a number of setbacks, in combination to the economic crisis in the island, more time was required.

According to Ayia Napa's mayor, Mr Yiannis Karousos, the park's theme is going to be "Greek Mythology", where artists are going to prepare underwater sculptures and other creations inspired by this subject (<http://www.cyprusprofile.com/en/articles/view/underwater-museum-planned-for-ayia-napa>). In a local media interview, in January 2015, Mr Karousos said that the

selected foreign artists had already begun the preparation of the first out of 17 sculptures that were planning to place near the artificial reef of Pernera (<http://www.sigmalive.com/news/local/197013/ypovryxio-eikastiko-mouseio-stin-agia-napa-apo-ton-aprilio>). The last unofficial updates on that were acquired through personal communication with an officer of the Municipality of Ayia Napa, who said that there are currently in the phase of carefully placing the sculptures in the sea and the opening of the museum is planned for the summer of 2017.

Based on Mr Karousos, their vision is to prepare an incomparable attraction, which will enhance the visitors' underwater experiences and strengthen the diving tourism of their municipality, following the guidelines applied in the world's best UM, the Cancun Underwater Museum MUSA. Their aim is to create unique sculptures exclusively made for Ayia Napa's UM, which will be placed in such a way, so they will not affect in any way the existing marine life, in line to the standards and regulations of Barcelona convention and other European strategies and directives.

Apart from this, it is interesting to mention that an Underwater virtual reality project which currently runs, called iMareCulture, aims in the creation of a virtual reality underwater museum <http://imareculture.weebly.com/project.html>. The project was launched by the Cyprus University of Technology (TEPAK), in collaboration of partners from 10 more universities, including the University of Cyprus, MARELAB department, Concordia University of Canada and others <http://cyprus-mail.com/2016/05/31/new-project-shed-light-underwater-history/>.

Inspired by the current accessibility restrictions and prohibitions of the public, to the underwater ancient shipwrecks and archaeological sites, the project aims to provide a virtual experience to the interested ones, remotely. Through exploring different ways of virtually introducing the Underwater Cultural Assess, the team will work towards the collection, processing, and creation of three-dimensional versions of existing underwater shipwrecks. In the end, the remote visitors will be able to have a personalised tour in the virtual reality museum, with the use of interactive holograms. Subsequently, they plan in creating real-time images through tablets placed in the underwater sites, which will transmit data as to the exact locations of the shipwrecks and give information on their history.

## Analysis on the ancient and modern shipwrecks of Cyprus

### I. Keryneia ancient shipwreck

The Keryneia shipwreck was a 14.75 m long, 4.30 m wide Greek merchant ship, which used to travel from the Aegean islands, or the Ionian coast to Cyprus and probably Syria. According to the Department of Antiquities, Ministry of Transport, Communications and Work, the ship is dated in the 4<sup>th</sup> century B.C., the period of Alexander the Great and his successors and was 80 years old before it sank (<http://www.mcw.gov.cy/mcw/DA/DA.nsf/All/114C347410C331AFC2257276003D12F2?OpenDocument>).

It was initially found in 1965 by Andreas Kariolou, at a depth of nearly 30 m and close to Keryneia port. In 1967 the Department of Antiquities invited a team of foreign experts and the excavation phase began under the direction of Professor Michael Katzev of the Pennsylvania University (USA). Five years were required in order to haul up and restore the wreck. Professor Richard Steffy who was sent by UNESCO, was in charge of assembling the wreck's remains. The archaeological importance of the ship lies in the fact that to this day it is considered the best preserved Greek ship of that period, since around the 75% of the ship's frame was preserved. This contributes with valuable information on ship construction and technology of those years.

Archaeologists estimated that based on the wreck's findings, the ship's crew was consisted of 4 people, since 4 small plates, 4 cups ("kantharoi") for drinking water, 4 olive oil vessels and 4 wooden spoons were found. Food remains were also identified, including 1 piece of garlic, 18 olive pips, 14 760 fig seeds and nearly 10000 well preserved almonds which were dated to nearly 288±B.C., with the use of C14.

Additionally, the ship's cargo was consisted of 404 amphorae of Rodian and Samian ware, some of which were stamped, an indication of the producers' identity and the amphora's content, like today's product labels. The Keryneia wreck is currently preserved in the Kyrenia museum, in Keryneia castle, in the occupied part of Cyprus. In 1982, the Greek Institute for the Preservation of Naval Tradition announced the construction of the life size exact replica of the wreck, the "Keryneia II", for scientific purposes. In this way, the ancient Greek navigation and ship construction could be studied in detail.

The Greek Ministry of Culture and the Keryneia Maritime Society contributed significantly in the construction of "Keryneia II" which after almost 3 years was completed. In 1986 Keryneia II travelled with four crew members, from Piraeus port to Pafos harbour. This replica is now stored in a controlled environment in Thalassamuseum, in Famagusta district. It is also worthy to mention that in 2002 a

third replica, “Keryneia Liberty” was constructed for the above reasons, with the valuable contribution of Professor Steffy. It was built with respect to the original design, but with the use of modern techniques. In 2004 Keryneia Liberty set sail from Cyprus to Athens, Greece carrying a symbolic cargo of copper to be used in the Olympic bronze medals. Keryneia Liberty is currently anchored in the new Limassol Marina.

## **II. Mazotos ancient shipwreck**

The Mazotos shipwreck was a late classical period merchant ship (mid-4<sup>th</sup> Century B.C.), which was found off the coasts of Mazotos village, in Larnaka district, at a depth of 45 m. The archaeological research on site began in November 2007, under the direction of Dr. Stella Demesticha and Professor Demetrios Michaelides, in a joint collaboration of the Department of Archaeology, University of Cyprus, with the Department of Antiquities ([http://www.mcw.gov.cy/mcw/da/da.nsf/All/E7FA95DF40DFCFAE422577B200386256/\\$file/mazotos%20press%20english.pdf](http://www.mcw.gov.cy/mcw/da/da.nsf/All/E7FA95DF40DFCFAE422577B200386256/$file/mazotos%20press%20english.pdf)).

During the first stages, focus was primarily given on the photographic and drawing documentation of the wreck. In 2009, with the contribution of the Laboratory of Marine Geology and Physical Oceanography of the University of Patras, the geophysical prospecting was followed, which was completed with the use of proton magnetometer and a sub-bottom profiler. During the first excavation phase, in June 2010, focus was given on excavating an area in the south part of the wreck, which resulted in finding among the amphorae, two lead rods with remains of wood.

During the second excavation phase, in 2011 parts of two anchor stocks were excavated, which provided essential information on the ancient ships’ sailing equipment. Also, the keel and part of the wooden hull of the ship were discovered, which proved that a part of the ancient ship lays under the amphorae ([http://www.mcw.gov.cy/mcw/da/da.nsf/All/E7FA95DF40DFCFAE422577B200386256/\\$file/PIO%20Mazotos%20Shipwreck%202011%20engl.pdf](http://www.mcw.gov.cy/mcw/da/da.nsf/All/E7FA95DF40DFCFAE422577B200386256/$file/PIO%20Mazotos%20Shipwreck%202011%20engl.pdf)).

During the third excavation phase, in 2012, they were able to estimate the size of the ancient ship’s hull to at least 15 meters (<http://www.mcw.gov.cy/mcw/da/da.nsf/All/E7FA95DF40DFCFAE422577B200386256?OpenDocument>). Such findings increase its archaeological value, since this wreck can provide essential information on shipbuilding during the Classical period. As part of its cargo, a great number of wine Chian amphorae were found, along with wine jugs and small fine ware pottery. An amphora from Kos was also found outside the main assemblage, which indicates it might have been the crew’s provisions. Food remains were also found, since many olive pips were identified.

The Mazotos shipwreck “signals the birth of Cypriot underwater archaeology, since it is the first underwater archaeological project conducted solely by Cypriot organizations” (Dr. Stella Demesticha). Based on the national report on Underwater Cultural Heritage, for the UNESCO Regional Meeting in October 2010, this wreck shed light to very important archaeological issues. These included the seafaring in ancient Cyprus, the commerce between Aegean and Cyprus, the types and sizes of period’s cargo ships etc. (<http://unesdoc.unesco.org/images/0018/001899/189961E.pdf>).

Currently, measures have been taken to ensure the greater protection of the Mazotos shipwreck, starting with the listing of the shipwreck as an Ancient Monument. Also, a protection zone of at least 200 meters around the wreck was approved by the Department of Fisheries and Marine Research, which will enforce limitations to fishing and any other underwater activities around the archaeological site.

### **III. Nissia ancient shipwreck**

As said by the Maritime Archaeological Research Laboratory (MARELab), of the University of Cyprus, the Nissia shipwreck is a wreck dated in the ottoman period and located in the Nissia area, in Famagusta, at a depth of 28 meters below sea level (<https://www.ucy.ac.cy/marelab/en/research/nissia-shipwreck>). It is the only shipwreck found in Cyprus, from that period and one out of few found in the Mediterranean.

This wreck was widely known to locals from 1980s, when the diving activity increased in the area. However, the official report to the Department of Antiquities came 12 years later. The initial steps to survey and protect the site included a visit from the Ephorate of Underwater Antiquities of Greece in 1994, whereas in 2004 a private company Aquatec, with the German institution DEGUWA made some attempts towards that. Since no formal measures were taken at that time, the destruction and looting of the shipwreck continued in the following years, resulting in the destruction of valuable archaeological evidence.

Taking into consideration all the above, in 2014 MARELab and the Department of Antiquities launched a research programme in the area, under the direction of Dr. Stella Demesticha, in order to document, protect and preserve the site, along with lifting of some chosen parts of the hull. According to them, the wreck lies on a sandy seabed, in an area of 24x11 m size and findings of it are scattered among the posidonia fields found there. They have currently found three cannons, along with a great number of bricks and some free wooden sections of the hull.

As stated by the Department of Antiquities, during the first excavation season, the research team opened a trial trench in the east extremity of the main concentration, which revealed a small part of the side of the hull which was well preserved (<http://www.mcw.gov.cy/mcw/da/da.nsf/All/D209C5830F372139C2257DE90030B451?OpenDocument>). They also lifted an iron canon, some wooden rigging-elements, pistol bullets, ceramics, glass tableware and bricks, which were transferred for preservation.

The documentation of the site with the use of 3D Digital photogrammetry methods, was also completed, with the contribution of the Department of Civil Engineering and Geomatics, of the Cyprus University of Technology. As stated, these actions could not have been completed without the generous sponsorship of the Honor Frost Foundation, the EDT company, the Purplesnow Management Ltd and Paralimni Municipality.

During this research study, methods of in situ preservation of the excavation trench and of the organic material of the seabed were studied and applied. These involved the reburying of the trench with fine sand, geotextile and sandbags to artificially cause the development of anaerobic conditions. Also, they performed experiments with the use of modern wood and sections of the shipwreck's timbers, in order to identify the optimal burial depth and test whether the organic material is best preserved in the Conservation Laboratory or inside the sand where it was found.

As stated by the Honor Frost Foundation, this research study offers a unique opportunity to establish good management practices to be applied in several underwater sites on the island. These could involve practices on laboratory based conservation of wooden finds, in situ techniques for preservation, along with the organization of public awareness activities (<http://honorfrostfoundation.org/dr-stella-demesticha-new-underwater-archaeological-investigation-of-a-medieval-shipwreck-at-nissia-paralimni-cyprus/>).

#### **IV. Zenobia wreck – A modern wreck, famous worldwide for diving**

MS Zenobia was a Challenger class roll-on-roll-off ferry, designed and constructed by a Swedish team in 1979 and which was sank during her maiden voyage in 1980, 1.5 km off the coast of Larnaka's district in Cyprus. The 165-m long ferry sailed from Malmö, Sweden with Tartous, Syria as a final destination. Along her journey, it passed through the Strait of Gibraltar, stopped at Heraklion and then to Piraeus ports. In Athens, the ferry's captain noticed some steering problems, which he linked with a problem in the electronic system of ballast-water introduction.

The problem continued even when they arrived in Cyprus, where the progressively great introduction of ballast water in the side ballast tanks made Zenobia capsize and sank. Before she was capsized it was decided to tow away the ferry, 1.5 km off the Larnaka's fishing port, to prevent any obstructions in case there was a catastrophe. There she sank to her portside on a flat bed of sand and rocks, at a depth of approximately 42 meters.

According to Larnaka Tourism Board, the "Titanic of the Mediterranean", as it was initially nicknamed, carried 104 trailers and trucks, cars, military equipment, telecommunication systems, games and food products, like hen eggs <http://larnakaregion.com/directory/product/zenobia-wreck>. The water great visibility of up to 50 meters, along with the ideal-for-dives temperatures of 16°C in the winter and 27°C in the summer, in combination to the marine life found there and the ships' cargo which seems frozen in time, make it one of the best wrecks in the world.

According to Aristidou *et al.* (2009), there are overall 67 different species of fauna and flora, belonging to 13 higher taxonomic groups. Among them the groups with the highest species diversity were the fish, with 25 different species, followed by sponges with 8 species, molluscs with 6 and chlorophytes with 6 as well. Focusing on the fish species, one can find giant dusky groupers (*Epinephelus marginatus*) near the wreck's doors and windows, barracuda (*Sphyraena viridensis*), amberjacks (*Seriola dumerili*), but also annular seabreams (*Diplodus annularis*) as well as scorpion fish (*Scorpaena loppei*). In addition, a diver can also observe different species of sponges (*Chondrosia reniformis*, *Petrosia ficiformis* and *Crambe crambe*), the bivalve *Spondylus gaederopus*, the fire worm *Hermodice carunculata* and the spoon worm (echiuroid) *Bonellia viridis*.

It is noteworthy to mention that according to the researchers, the wreck's structural characteristics, combined with the different lighting conditions and hydrodynamic circulation of the wreck, have proven to be the reasons behind Zenobia's successful colonization by marine species.

These characteristics lead to the creation of microhabitats, with species finding an ideal shelter in them, something which is also supported by the fact that the number of individuals of each species is often greater than the surrounding natural reefs. It is important to note that some of the species found at the Zenobia wreck belong to the species protected by the relevant EU regulations (e.g. *Pinna nobilis*, *Spondylus gaederopus*, *E. marginatus*). Among them, one can also observe various lessepsian migrants (alien species from the Red Sea that spread through the Suez Canal) like *Caulerpa cylindracea*, *Halophila stipulacea* and *Synaptula reciprocans*, in increased numbers.

Taking into consideration the above described high species diversity, it is now clear to understand why the Zenobia shipwreck is often characterised as one of the top 10 best wrecks in the world, in terms of diving, with over 40 000 divers visiting it annually. In fact, as the researchers say, it's considered as an ideal artificial reef - an oasis of life - since it provides shelter to a high number of species that live on the wreck's site, feed on it and reproduce.

The most relevant governmental act towards the protection of the existing marine life and resources on the Zenobia shipwreck, was the announcement of the decree on the national law on fishing, which prohibits any type of fishing activity in a proximity of less than 500 meters from the wreck (KDP 200/2008). However, no management plans are currently implemented for the overall protection of the environment and the subsequent promotion of the sustainable development of the area, something that demands to be soon dealt as a priority by the region's or even government's policy makers.

## **Analysis on the Natura 2000 Marine Protected Areas**

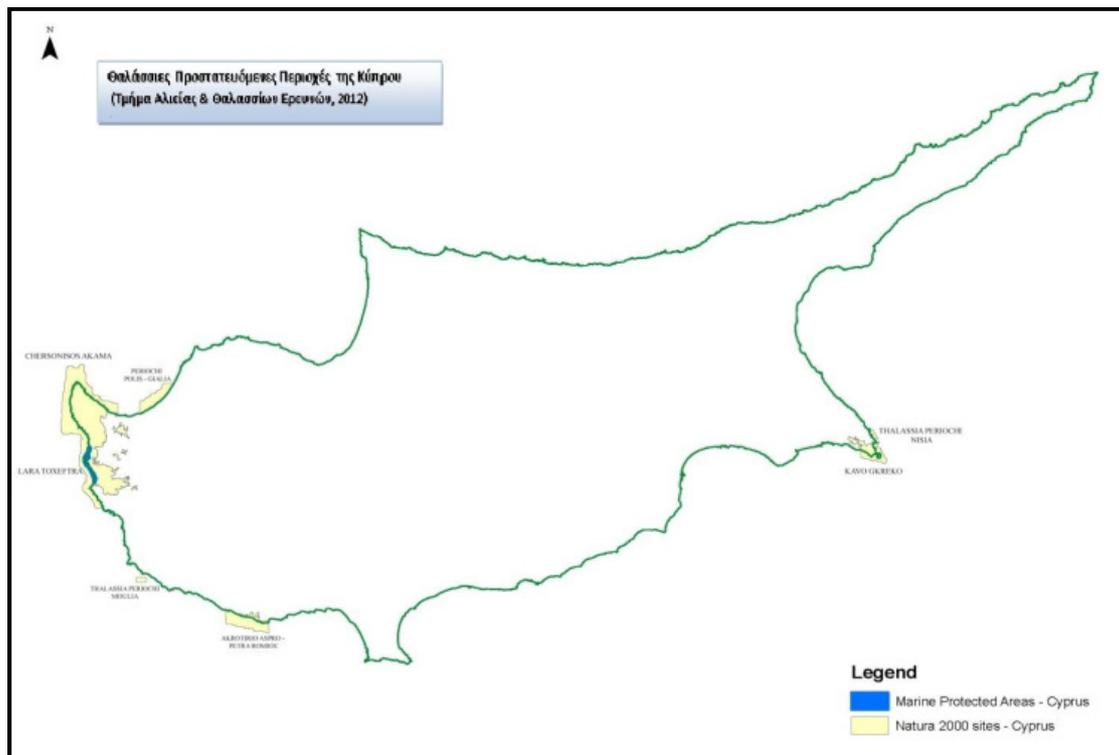
The Natura 2000 network consists a European cohesive, ecological network of protected areas for fauna and flora species and important habitats, aiming to safeguard the most precious and threatened European ecosystems. Today in Cyprus there are 6 coastal/marine areas of the Natura 2000 network, which include the sites in Polis-Gialia (CY4000001), in Akamas (CY4000010), in Moulia (CY4000006), Cape Aspro-Petra Romiou (CY5000005), Cape Greco (CY3000005) and Nissia (CY3000006) (Figure 10).

In Cyprus, the marine Natura 2000 sites have the legislative status of Sites of Community Importance. In 2008 the European Union confirmed those sites as SCI, which were at that point classified as Special Protection Areas and proposed as SCI. These areas are considered a valuable tool towards the successful protection of marine life and resources, with the subsequent management of fisheries. The MPAs of Cyprus include the marine areas where artificial reefs are (more details later) and the Lara-Toxeftra site which is included in the Natura 2000 site of the Akamas peninsula.



**Figure 11:** Map of the Natura 2000 sites of Cyprus. This network includes the Sites of Community Importance (SCI) for the protection of important communities of fauna and flora species, and important habitats and the Special Protection Areas (SPAs) where important bird populations find shelter. With green the SCI are marked, with red the SCI and SPAs and with yellow the SPAs.

These sites include important habitats and fauna and flora species protected from the EU Directive 92/43/EEC, on the conservation of natural habitats and of wild fauna and flora. In the Akama Peninsula (Chersonisos) the Marine Protected Area of Lara Toxeftra is considered one of the most important nestling habitat of the marine turtles, *Chelonia mydas* and *Caretta caretta* (Figure 2).



**Figure 12:** The map of the Marine Protected Areas of Cyprus. The blue colour indicates the MPAs, whereas the light-yellow marks the marine Natura 2000 sites.

Information on these Marine Protected Areas, within the Natura 2000 network can be found in the links below on the Standard Data forms for the SPAs, the proposed sites for Community Importance, the SCI and the Special Areas of Conservation (SAC).

→ Kavo Gkreko or Cape Greco (CY3000005)

<http://natura.environment.moa.gov.cy/CY3000005.html>

→ Thalassia Periochi Nisia or Marine area of Nissia (CY3000006)

<http://natura.environment.moa.gov.cy/CY3000006.html>

→ Periochi Polis-Gialia or Marine area of Polis-Gialia (CY4000001)

<http://natura.environment.moa.gov.cy/CY4000001.html>

→ Thalassia Periochi Moulia or Marine area Moulia (CY4000006)

<http://natura.environment.moa.gov.cy/CY4000006.html>

→ Chersonisos Akama or Akama Peninsula (CY4000010)

<http://natura.environment.moa.gov.cy/CY4000010.html>

→ Akrotirio Aspro-Petra Romiou or Cape Aspro-Petra Romiou (CY5000005)

<http://natura.environment.moa.gov.cy/CY5000005.html>

## **Analysis on the Marine Protected Areas with artificial reefs**

It is important to add that in Cyprus, the marine areas with artificial reefs have also a legislative status of Marine Protected Areas, since they are covered by a protection system which provides several restrictions, such as fishing and the regulation of vessel passage.

As stated in the National Strategic Plan for the creation of artificial reefs, released by the Department of Fisheries and Marine Research (DFMR), Ministry of Agriculture, Rural Development and Environment, the artificial reefs are basically constructions which mimic the natural reefs' characteristics. They are purposely placed on the seabed in carefully selected areas, where they act as shelters and places for feeding and reproduction of the existing marine life.

The first pilot MPA with artificial reefs was in the marine area of Amathounta, which included the ancient port of Amathounta and the artificial reef which was created ([http://www.moa.gov.cy/moa/dfmr/dfmr.nsf/All/8A6B97C51CF74D1242257D9600445315/\\$file/Amathounta%20gr.pdf?OpenElement](http://www.moa.gov.cy/moa/dfmr/dfmr.nsf/All/8A6B97C51CF74D1242257D9600445315/$file/Amathounta%20gr.pdf?OpenElement)).

In the following years, with the successful utilization of economic resources provided through European funding from the already completed European fisheries fund of 2007-2013, the establishment of Marine Protected Areas with artificial reefs in the marine areas of Paralimni, Ayia Napa, Limassol and Pafos, was achieved.

Similar actions will continue with funding from the ongoing European maritime and fisheries fund of 2014-2020, which include the enrichment of existing protected areas with artificial reefs and the subsequent addition of two new marine areas in Larnaka and Polis Chrysochous. It is important to mention that both programmes were co-financed by the Republic of Cyprus and the European Union.

Through the creation of MPAs with artificial reefs, the DFMR aims the medium-term increase of species diversity and the restoration and increase of fish stocks ([http://www.moa.gov.cy/moa/dfmr/dfmr.nsf/All/33F5C12165A1F72742257D960043FDC9/\\$file/TEXNHTOI%20YFALOI.pdf?OpenElement](http://www.moa.gov.cy/moa/dfmr/dfmr.nsf/All/33F5C12165A1F72742257D960043FDC9/$file/TEXNHTOI%20YFALOI.pdf?OpenElement)).

Additional targets include the protection and enrichment of marine biodiversity, the ecosystem upgrade and the attraction and enrichment of diving tourism. Subsequently, they will act towards sites for contacting scientific research and for the promotion of environmental awareness for the protection of marine life and the marine environment in general, through environmental education activities.

## Guidelines and legislation

For this report, a thorough research was followed on the various relevant international, European and national policies, as well as on Strategic Environmental Assessments, governmental reports, plans and actions were reviewed for the identification of the legislative restrictions and the conflicts and compatibilities between 60 different parameters.

### Natura 2000 Marine Protected Areas

The guidelines regarding the designation, protection and management of the Natura 2000 sites and the Marine Protected Areas follow the European Directives 92/43/EEC and 2009/147/EC, and the national laws adapted based on them. Specifically, the National law on the protection and management of Nature and Wild Life (153(I)/2003) and its forthcoming amended laws (131(I)/2006, 113(I)/2012 and 67(I)/2015), based on Directive 92/43/EEC; and the National law 152(I)/2003 on the protection and management of wild birds, based on Directive 2009/147/EEC.

Focusing on the national laws on the Marine Protected Areas a number of specific regulations are applied. Specifically, according to the Fishing regulations (KDP. 273/90) and especially the regulation 14, restrictions related to fishing and passage within the MPA of Lara-Toxeftra are applied from the 1<sup>st</sup> of June to the 30<sup>th</sup> of September each year. Also, specific measurements for the Special Protection Areas in Moulia and in the marine area at Nissia are reported in the national decree KDP230/2016 on the protection and management of Nature and wild life.

In this decree, it is stated that the marine habitats with *Posidonia oceanica* (1120\*) and the reefs (1170) need to remain in excellent condition. Activities which can threaten in any way the important marine habitats and species are forbidden. The need to strengthen the environmental awareness of local communities through environmental education programmes is also emphasized.

Subsequently, as stated in the national Decree KDP292/2015, the Special Protection Area of Cape Aspro-Petra Romiou (as established with the decree KDP.294/2015) a number of measurements need to be applied. These include, the protection and improvement of the *posidonia* fields (1120\*), the year-long vegetation in the tidal range (1210) and the area's reefs (1170) in excellent condition.

Other measurements on the protection of land flora and fauna species (including the wild birds of the area) are also reported in this decree. As in the decree KDP230/2016 restrictions on destructive activities and highlights on environmental awareness and educations are included.

### **Marine Protected Areas with Artificial reefs**

The construction of artificial reefs in Cyprus follows the National Strategic Plan (NSP) on Artificial reefs and the guidelines set in it. Also, as stated in NSP of artificial reefs, policies that set the legislative framework include the National Law on fishing (CAP.135), especially the fifth article of its amending law (N.106(I)/2004). Also, the United Nations' Mediterranean Action Plan of 2005, on the "Guidelines for the placement at sea of matter for purpose other than mere disposal (construction of artificial reefs)" (UNEP(DEC)/MED WG.270/10).

The guidelines below for the development/construction of artificial reefs in Cyprus are based on the National Strategic Plan on Artificial reefs, announced by the Department of Fisheries and Marine Research, Department of Agriculture, Rural Development and Environment.

→ They must be placed in areas which extend from the coastline to the contour depth of 35 to 40 meters, targeting the protection of almost all life stages of most coastal zone species.

→ They must be placed in marine areas relatively close to ports, marinas, fishing shelters etc., with weak winds and sea currents.

→ They should not be placed over important habitats like a rocky seabed, posidonia fields etc.

→ Prior to the creation of the artificial reef, an environmental and spatial analysis is required, which needs to be approved by the Department of Fisheries and Marine Research and the Department of Environment. This research must include the description of the habitats and the recording of the macrofauna and macrophyte species found in the chosen area. Also, the specific location for the placement of the artificial reefs, a description, plans and the construction materials used in them need to be included, along with an environmental assessment on the effects caused by this construction.

→ In case a vessel is used as an artificial reef, this subsequently needs to be suitable for such use, in terms of size and construction.

→ The creation of an artificial reef requires the establishment of a marine protected area, where various uses and activities could be applied in line to the guidelines set for the MPAs. The permitted uses include diving, fastening in specific locations, controlled passage of vessels, swimming, scientific research, environmental education and awareness activities. In contrast, the forbidden activities include any source of fishing activities, the sampling of species, anchoring etc. This is in agreement with the

decree KDP. 51/2014 on the Fisheries law, which defines that any type of fishing activity, vessel passage and anchoring (except in the specified passages) are forbidden in the MPAs of Amathounta, Paralimni and Limassol for the protection of marine life and resources.

Concerning the management programme for the area of artificial reefs, it is stated in the NSP for artificial reefs, that a managing authority will be created with members including an officer from the Department of Fisheries and Marine Research, and an individual representative from the local authority, the Cyprus Tourism Organization, and the Cyprus Association of diving centres. Representatives from other governmental departments, research entities, associations, local development companies, non-governmental organizations and individual specialists will be invited in meetings related to their field of expertise.

The managing authority will need to oversee, coordinate, and solve any problems relevant to the operation and management of artificial reef sites. Also, a management plan will be adapted which will include measurements and provisions related to the use, protection, control, and general management of these areas.

### **Diving Parks and Underwater museums**

Currently, no specific guidelines are applied on the subject, since as a country we do not have a diving park or an underwater museum yet. If we take into consideration the steps already applied in other situations, it is critical to initially review all the relevant policies, governmental plans and actions (if exist) and prepare a Strategic Environmental Assessment prior to such development.

Generally, as stated in the Regulations for the marine scientific research in Cyprus, a licence is important to be obtained by the Ministry of Agriculture, Rural Development and Environment before proceeding to any research activity. This licence is needed for example for the placement of research instruments in the water (KDP 577/2014).

### **Modern Shipwrecks**

Concerning the Zenobia shipwreck, the Minister of Agriculture, Rural Development and Environment announced a decree in 2008, which prohibits any fishing activity in a radius of 500 meters from the Zenobia shipwreck, for the protection of marine life and resources (KDP 200/2008). Also, according to the national law on shipwrecks, among others, it is prohibited to remove or transfer part or all the wreck (or the ship near sinking) and to intervene or delay in any way the ship's rescue. Hiding any information related to a shipwreck, or the alteration (e.g. looting and destruction) of the wreck in any way is also considered a crime (CAP.298).

## **National laws and Strategic plans on environment**

Concerning the national policies, they are all written in Greek. In case there is more interest on these policies, a brief translation of the main points of the policy can be provided upon request.

→ Strategy of Cyprus on a National Integrated Maritime Policy

The Strategy of Cyprus on the application of the European Commission's Integrated Maritime Policy.

[http://www.mcw.gov.cy/mcw/dms/dms.nsf/All/FE7DD75D7F02563DC2257D9E00404B11/\\$file/%CF%83%CF%84%CF%81%CE%B1%CF%84%CE%B7%CE%B3%CE%B9%CE%BA%CE%AE%20%CF%84%CE%B7%CF%82%20%CE%BA%CF%8D%CF%80%CF%81%CE%BF%CF%85%20%CE%B3%CE%B9%CE%B1%20%CE%BC%CE%AF%CE%B1%20%CE%BF%CE%B8%CF%80.pdf](http://www.mcw.gov.cy/mcw/dms/dms.nsf/All/FE7DD75D7F02563DC2257D9E00404B11/$file/%CF%83%CF%84%CF%81%CE%B1%CF%84%CE%B7%CE%B3%CE%B9%CE%BA%CE%AE%20%CF%84%CE%B7%CF%82%20%CE%BA%CF%8D%CF%80%CF%81%CE%BF%CF%85%20%CE%B3%CE%B9%CE%B1%20%CE%BC%CE%AF%CE%B1%20%CE%BF%CE%B8%CF%80.pdf)

→ Strategy of Cyprus on Biodiversity

The Strategy of Cyprus which was prepared in line with the Secretariat on the Convention on Biological Diversity and the relevant EU strategies on biodiversity.

→ The National law on the protection of the environment through criminal law

This law was adapted in harmonization with the Directive 2008/99/EK on the protection of the environment through criminal law.

[http://www.cylaw.org/nomoi/arith/2012\\_1\\_022.pdf](http://www.cylaw.org/nomoi/arith/2012_1_022.pdf)

## **National laws on cultural heritage**

As a note, it is important to add that UNESCO's database on National Cultural Heritage Laws is critically useful for the identification of all the relevant national policies on cultural heritage, since they provided all the national laws translated in English:

<http://www.unesco.org/culture/natlaws/index.php?&lng=en>

→ Cyprus Antiquities law (CAP.31)

[http://www.unesco.org/culture/natlaws/media/pdf/cyprus/cy\\_law\\_antiquities\\_engt\\_of.pdf](http://www.unesco.org/culture/natlaws/media/pdf/cyprus/cy_law_antiquities_engt_of.pdf)

→ Law 182(I)/2002 on the export of cultural goods

[http://www.unesco.org/culture/natlaws/media/pdf/cyprus/cy\\_law\\_182\\_engtof.pdf](http://www.unesco.org/culture/natlaws/media/pdf/cyprus/cy_law_182_engtof.pdf)

→ Law 183(I)/2002 on the return of cultural objects

[http://www.unesco.org/culture/natlaws/media/pdf/cyprus/cy\\_law\\_183\\_engtof.pdf](http://www.unesco.org/culture/natlaws/media/pdf/cyprus/cy_law_183_engtof.pdf)

→ Regulations on the Protection of Underwater Cultural Heritage of 2016 (KDP. 218/2016)

[http://www.mfa.gov.cy/mfa/mfa2016.nsf/all/6FF70C6DCDE61D12C2258030002E26A3/\\$file/10.%20%CE%9A%CE%B1%CE%BD%CE%BF%CE%BD%CE%B9%CF%83%CE%B](http://www.mfa.gov.cy/mfa/mfa2016.nsf/all/6FF70C6DCDE61D12C2258030002E26A3/$file/10.%20%CE%9A%CE%B1%CE%BD%CE%BF%CE%BD%CE%B9%CF%83%CE%B)

[C%CE%BF%CE%AF%20%CF%80%CE%B5%CF%81%CE%AF%20%CE%A0%CF%81%CE%BF%CF%83%CF%84%CE%B1%CF%83%CE%AF%CE%B1%CF%82%20%CE%95%CE%BD%CE%AC%CE%BB%CE%B9%CF%89%CE%BD%20%CE%91%CF%81%CF%87%CE%B1%CE%B9%CE%BF%CF%84%CE%AE%CF%84%CF%89%CE%BD%202016.pdf?openelement](#)

→ Memorandum of Understanding between the Government of the United States of America and the Government of the Republic of Cyprus concerning the Imposition of Import Restrictions on Pre-Classical and Classical Archaeological Objects and Byzantine Period Ecclesiastical and Ritual Ethnological Materials (amended 2012)

[http://www.unesco.org/culture/natlaws/media/pdf/cyprus/cyprus\\_mouusa12\\_enorof.pdf](http://www.unesco.org/culture/natlaws/media/pdf/cyprus/cyprus_mouusa12_enorof.pdf)

→ Agreement between the Swiss Federal Council and the Government of the Republic of Cyprus on the Import and Repatriation of Cultural Property

[http://www.unesco.org/culture/natlaws/media/pdf/switzerland/sw\\_ba\\_cyprus\\_13\\_entof](http://www.unesco.org/culture/natlaws/media/pdf/switzerland/sw_ba_cyprus_13_entof)

→ Modern shipwrecks: concerning the Zenobia shipwreck, the Minister of Agriculture, Rural Development and Environment announced a decree in 2008, which prohibits any fishing activity in a radius of 500 meters from the Zenobia shipwreck, for the protection of marine life and resources (KDP 200/2008). Also, according to the national law on shipwrecks, among others, it is prohibited to remove or transfer part or all the wreck (or the ship near sinking) and to intervene or delay in any way the ship's rescue. Hiding any information related to a shipwreck, or the alteration (e.g. looting and destruction) of the wreck in any way is also considered a crime (CAP.298).

## PORTUGAL

### Underwater Archaeological Trails

In Portugal there are several underwater trails created to allow the public to learn about this history and to provide access to these underwater sites. Visitors on the trails may follow signposts with captions in Portuguese and English and find that it is a fascinating way to learn about history and embark on a culturally rich and unique diving trip.

[http://www.academia.edu/5066045/Portuguese Underwater Archaeological Trails and Preserves](http://www.academia.edu/5066045/Portuguese_Underwater_Archaeological_Trails_and_Preserves)
<http://unesdoc.unesco.org/images/0022/002273/227331E.pdf>



*Figure 13: map of Portugal, Madeira and Azores*

#### Océan Trail (Salema Beach, Algarve)

It's an admiral ship of a French fleet, sent to invade Britain and intercepted in the Algarvian waters by an English Armada in August 1759. In the area, there are some

heavy items, such as cannons and anchors left *in situ*. The maximum depth goes from 6 to 9 meters and the site is available for snorkelers and Scuba divers. For more information visit: <http://www.icomos.org/risk/2006/29alves2006an.pdf>

### **Faro Trail (Faro, Algarve)**

Off the Santa Maria cape, near the city of Faro, capital of the Algarve province in southern Portugal there is the “Faro Trail”. The trail involves a non-identified shipwreck which is an oblong tumulus situated at twenty metres below on a sandy seabed and is dated to the last quarter of the 17th-century. The trail is coordinated by the CNANS and there are school’s instructors supervising visiting divers. For more information visit: <http://www.icomos.org/risk/2006/29alves2006an.pdf>

### **Pedro Nunes/Thermopylae trail (Cascais)**

The trail involves the wreck of the “twin” and rival clipper of the Cutty Sark who was bought by the Portuguese navy at the end of the 19th-century and sunk in 1907. It is located at a depth of 30 meters and can be visited by divers. For more information visit: <http://www.icomos.org/risk/2006/29alves2006an.pdf>

### **AZORES ISLANDS:**

Around the Azores Archipelago the government created five protected Archaeological Underwater Parks. These Archaeological Parks reflect the history of the Azores as an important location during the 21st century discoveries and as a centre of sailing and shipping traffic. All sites protect shipwrecks from different eras and show the importance that the Azores had for ships crossing the Atlantic.

### **Terceira Island, Underwater Archaeological Park of the Bay of Angra do Heroísmo (Azores)**

Cultural heritage and site: It is a true underwater museum with more than 40 ancient anchors, sometimes over 3 metres long, from many centuries ago, littered across the ocean floor. Another dive site with archaeological interest lies only 100 metres away from the ‘Cemetery of Anchors’ (where there are more than 40 discarded anchors of the classic admiralty pattern ) is the steamer ‘Lidador’ wrecked here on its way to Brazil in 1878. It rests at a depth of just 10 metres and is a fantastic breeding ground for small marine species. For more information visit:

<http://nautarch.tamu.edu/shiplab/angra001-proj.htm>

<http://mpas-portugal.org/azores/underwaterarcheologicalparks/>

[http://www.academia.edu/211661/The\\_Azores\\_underwater\\_cultural\\_heritage\\_strategies\\_surveys\\_excavations\\_and\\_results\\_1995-2000](http://www.academia.edu/211661/The_Azores_underwater_cultural_heritage_strategies_surveys_excavations_and_results_1995-2000)

### **Flores Island, Underwater Archaeological Park of Slavonia (Azores)**

Cultural heritage and site: The park protects the area around the Royal Mail Ship (RMS) Slavonia who lays at a depth of 5-15 meters and can be easily accessed by snorkel or SCUBA diving. For more information visit:  
[http://www.azores.gov.pt/Portal/en/entidades/srec-drcultura/noticias/Underwater Archaeological Park of Slavonia created on Flores.htm?mode=category](http://www.azores.gov.pt/Portal/en/entidades/srec-drcultura/noticias/Underwater%20Archaeological%20Park%20of%20Slavonia%20created%20on%20Flores.htm?mode=category)

### **Santa Maria Island, Underwater Archaeological Park Canarias (Azores)**

Cultural heritage and site: It is located in the shallow waters close to Praia Formosa and involves the Spanish steam ship "Canarias" used for transporting troops during the Ten Years War between Spain and Cuba and sunk in 1871. For more information visit:  
[http://www.azores.gov.pt/Portal/en/entidades/srec/noticias/Regional Government creates Underwater Archaeological Park of Canarias on Santa Maria.htm](http://www.azores.gov.pt/Portal/en/entidades/srec/noticias/Regional%20Government%20creates%20Underwater%20Archaeological%20Park%20of%20Canarias%20on%20Santa%20Maria.htm)  
<http://www.wrecksite.eu/wreck.aspx?216096>

### **Pico Island, Underwater Archaeological Park Caroline (Azores)**

Cultural heritage and site: It is located off the coast of Areia Larga on Pico Island, at 8-10 meters depth, where lays the French sailing vessel Caroline, sunk in 1901. The Park protects the impressive 98 meters long and over 3000 tons heavy wreck. For more information about the wreck visit: <http://www.wrecksite.eu/wreck.aspx?217588>  
[http://www.academia.edu/211661/The Azores underwater cultural heritage strategies surveys excavations and results 1995-2000](http://www.academia.edu/211661/The_Azores_underwater_cultural_heritage_strategies_surveys_excavations_and_results_1995-2000)

### **São Miguel Island, Underwater Archaeological Park Dori (Azores)**

Cultural heritage and site: It is located at Ponta Delgada, on São Miguel Island, at a depth of 15-20 meters where rests the tramp steamer ship Dori. The Park protects the site where the ship sunk in 1961 on its way from Germany to the United States of America. It is one of the most popular dive sites of São Miguel and loved by wreck divers due to the great condition of the wreck. For more information visit:  
<http://dive.visitazores.com/en/divespots/dori>  
<http://dive.visitazores.com/en/topten/diving-second-world-war-shipwreck-sao-miguel-island>

## FRANCE

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### **Analysis of Underwater Museums and Diving Parks**

The underwater archaeology has rapidly developed in the last decades, pushed by the new technologies and especially by the invention of the Aqua Lung, the father of scuba diving, Jacques Cousteau (Bordeaux, 1910 – Paris, 1997), which allowed to reach the sea depths over the previous limit of -20 meters.

This progress caused an increased looting activity by the professional ‘wreck raiders’ that ransacked the underwater archaeological sites searching for gold, jewels and other treasures. In 1966, the Ministry of Culture, through the Minister André Malraux, created the DRASM (*Département des Recherches Archéologiques Sous-Marines*), today DRASSM.

Its vocation is to manage the underwater archaeological heritage. It is competent for every diving archaeological research and is committed to the application of the ‘Code du Patrimoine (Ordonnance n° 2004-178 du 20 février 2004) titre III, chapitre 2’ on the conservation of underwater heritage sites and artefacts.

Its competence area is particularly vast, along over 10.000 km of coastline, extended on the sea until 24 marine miles (over 44 km). The extension to the ‘exclusive economic area’ would mean for it to manage more than 11 million square meters.

<http://www.culture.gouv.fr/fr/archeosm/archeosom/drasm.htm>  
<http://www.unesco.org/culture/pdf/NR-France-Drassm-en.pdf>

### **Natura 2000 Marine Protected Areas**

(updated September 2016)

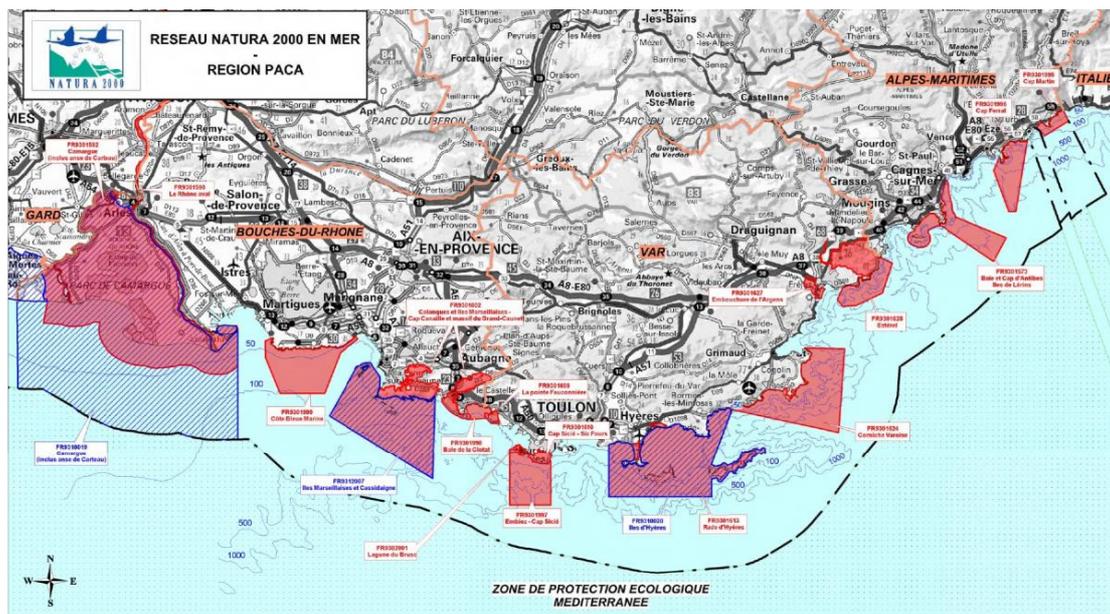
France has a huge surface of natural heritage preservation areas, and in particular, the MPAs cover a considerable sea surface. Below, the sea protected areas the surfaces are divided by region:

AQUITAINE	548.333 ha
BASSE-NORMANDIE	228.377 ha
BRETAGNE	683.765 ha
CORSE	516.109 ha
HAUTE-NORMANDIE	185.259 ha
LANGUEDOC-ROUSSILLON	123.034 ha

NORD-PAS-DE-CALAIS	245.805 ha
PAYS DE LA LOIRE	589.377 ha
PICARDIE	31.021 ha
POITOU-CHARENTES	674.270 ha
PROVENCE-ALPES-COTE D'AZUR	320.792 ha

**Total Surface 4.146.142 ha**

<https://inpn.mnhn.fr/site/natura2000/stats>



**Figure 14: Map of the Cote d'Azur Natura 2000 Areas**

## Underwater Trails

In this context, focusing on the archaeological and historical underwater sites there are currently in France, many Underwater Diving Trails, mainly located along France's southern coastline, known as the French Riviera. There are also notable wreck dives off Normandy, on the English Channel.

<http://diveadvisor.com/france>

### Provence-Alpes-Cote D'Azur

The area from St. Tropez to the Porquerolles islands is scattered with numerous wrecks sitting on sandy bottoms with clear warm water.

- Cavalaire Bay - The Togo, cargo ship sunk in the 1st WW:

It split in two when sank, and the bow is the shallower part. She lies in the Eastern side of the bay of Cavalaire, sitting upright on her keel. The last quarter of the wreck lies in

67m of water not far from the bow. The bow is aligned with the coast and is in an excellent state, being protected from all major winds. The wooden bridge has disappeared; the holds are filled with coal. The engine room is like a cathedral, of several meters high, with enormous engines. The second part of the wreck is found a few hundred meters away, completely deformed, with the bridge and propeller lying there.

- Cavalaire Bay - The Espingole, 1903.

Another beautiful wreck in the Cavalaire Bay is the “Espingole”, which was built in 1900 at Le Havre, in the shipyard of Augustin Normand. It joined the Middle East squadron in 1901, and participated in an expedition to Turkey. At the beginning of 1903 it was based at Toulon. On the faithful day 4 February 1903, while participating in naval exercises, at top speed it hit the rocks called Taillat. Aground on the rocks, efforts started to get it to refloat, with its armaments and heavy material jettisoned or transferred. Refloated, an attempt was later made to tow it to the nearby beach of Cavalaire, but less than 800 m later it eventually sank. It now lies a bit further to the South than the Togo, on a sandy bottom, at a depth of 38 meters, with no currents, and protected from the prevailing winds. The engines are easily visible, surrounded by bricks of coal, some bearing a stamp mark. There is no superstructure to speak of, since this boat was being designed for speed. The guns have been removed at some point.

- Le Relax, Saint Tropez - The Rubis, French navy submarine:

It was captured by the Germans and converted into a minesweeper. Later scuttled a few kilometers south of cap St Tropez and used by the Germans as a sonar target. It sits upright on a sandy bottom at a depth of 40 meters, almost intact except for a few missing plates.

- Basses de Can - Roman shipwreck:

South of the Cap de Saint-Tropez, this Roman shipwreck is resting in an area measuring 80 x 90 square metres. It was assessed in 1987 using the single-seat submarine Nérée.

- Bagaud 2 shipwreck:

It is located to the north of the island of Bagaud, between Port-Cros and Porquerolles, at a depth of 18 meters. It has the appearance of a consolidated bulk. The concretion of the wreck happened because of its cargo of small iron ingots of 2 to 3 kg. This cargo is evidence of the trade in raw materials between the Western and Eastern Atlantic regions at the end of the second and beginning of the first century BC. According to

the round inscription, the merchants were Celts, specifically "Hypocelts", who were assembled by a Greek named Heracleides for the commercial exploration of this tin.

- Port-Cros - the archaic wreck of the Palud:

The Palud rests at a depth of six to eight meters at the landing of Port-Cros, at the foot of a dangerous rock barrier which was probably the cause of the ship's sinking.

The ship dates to the sixth century AD. Since shipwrecks from that period are rare, the site is crucial in furthering our knowledge of commerce in the Western Mediterranean during the transition from late Antiquity to the High Middle Ages. The cargo mainly comprised of large cylindrical African amphoras with Early Christian graffiti. Eastern amphoras from Syria and Palestine completed the cargo. Two African sigillated plates, some fragments of common pottery, and a casket, were also found.

- Bay of Agay - Munitions barges, WWII:

Lying at 38 meters deep on the sandy seabed, a German munition barges sunk, hit by a lone British Submarine. The tug was transporting barges loaded with bombshells to Italy from Marseilles when three torpedoes gained it. Stern posts of the barges are still clearly visible, as are the hundreds of bombshells, some still packed in racks.

- Underwater Trails – Hyères:

Near Toulon, the Hyères archipelago is made of three Islands declared French National Park: Ile de Porquerolles, Ile du Levant and Port-Cros. It is a unique site in France, where the Roman dock and the wreckages of the ancient times and of the nineteenth century can be admired by snorkeling or diving. The submerged archaeological remains of Olbia, a fortified maritime outpost and a colony on the way to Marseille, are another significant attraction.

<http://www.hyeres-tourism.co.uk/sea-activities/year-round-activities/underwater-trails>

<http://www.hyeres-tourism.co.uk/hyeres-highlights/unmissable/ancient-olbia>

<http://www.hyeres-tourism.co.uk/plan-your-trip/leisure/visits-and-excursions/405055-sentier-marin-archeologique-dolbia>

<http://www.scubatravel.co.uk/france/francedive.html>

- Hyères, Pointe de Lequin – Archaic and classical period shipwrecks:

On the Northern coast of the Island of Porquerolles lies a rocky point close to a harborage. Its stormy conditions were the cause of many shipwrecks, and in particular the sinking of four ancient boats:

- Pointe Lequin 1A: Greek ship from the sixth century BC.
- Pointe Lequin 1B: Ship from ancient Marseilles, fifth century BC.
- Pointe Lequin 2: Late second, early first century BC.

- Pointe Lequin 3: : Mid first century AD.

Pointe Lequin 1A: This vessel from the archaic period, transported wine and dishes towards the Marseilles. Its cargo contained Ionic and Attic black figure drinking cups, lamps, Attic amphoras, vases, and statuettes. A packet of wine amphoras, principally from Eastern Greece, completed the cargo. The ship dates to the middle of the sixth century BC. The over 600 pieces of Attic pottery, dating to 520-510 BC, are essentially Bloesch C bowls. They are sometimes decorated with a medallion motif (gorgon, sphinx, serpent, rooster, lion). There were also eye bowls of various sizes.

Pointe Lequin 3: found several Dressel 2/4 amphoras from Tarraconaise(Spain).

- Hyères - the Slava Rossii:

In 1780, during the War of Independence of the United States, France and the Great Britain once again confronted each other. In order to protect her merchant fleet, Catherine the Great, the empress of Russia, launched three fleets as part of the Ligue of Neutrals, the first legal declaration of the freedom of the seas. The Slava Rossii (Pride of Russia) was separated from the rest of the fleet during inclement weather on the Mediterranean, and sank south of the Island of Levant following a navigational error. The ship was armed with 66 cannons, and was built in 1774 at Arkhangelsk by Gunion and Portnov, two Russian master builders. The shipwreck was discovered in 1957, and was subject of two excavation campaigns in 1980 and 1981. Beside a large section of the hull, it has rendered important archeological items, like a large range of weapons, from light arms (rifles, pistols, swords, daggers) to heavy artillery (mortars, "unicorns", cannons and their accouterments). Innumerable objects that exemplify daily life and work on board, like on-board dishes (porcelain and faience dishes, pewter plates, a saltcellar, and spoons), personal objects (thimbles, cufflinks, stockings, candle extinguishers, dice, perfume flasks), and a remarkable series of portable icons (80) made of a copper alloy (diptychs, triptychs, portable altars, some of them decorated in cloisonné enamel) were also found.

- Madrague de Giens – archaic shipwreck:

In the beginning of the second century BC, many ships transporting wine amphoras and pottery sailed from Italy towards Gaul and Iberia (Spain). Around 75-60 BC, a large commercial sailboat coming from Central Italy sank off the harbor of Madrague de Giens, at the North-Western tip of the Giens peninsula. The ship transported a large cargo of about 600 wine amphoras and several black-lacquered vases. Work on the excavation of the objects, cleaning off the sediment, tagging in situ, and the photogrammetric analysis of various layers of cargo gave a better understanding of the disposition of the cargo. The amphoras were stacked in alternating rows on three

levels, and steadied with sprigs and branches that limited friction. The amphoras' inscriptions, particularly the mark of Publicus Veveius Papus, made it possible to pinpoint the origin of the cargo. The Terracine area in the South of Latium, where pots with the same stamps were found in their place of manufacture.

The detailed study of the hull, which is exceptionally well preserved, revealed precise characteristics of this large ship, which resembled the sailboat in a mosaic from the Thermes of Themetra.

- Carry-le-Rouet – II century BC cargo ship:

The ship, carrying a cargo of stoneblocks for construction, ran aground in the second century BC, in the entrance of the harbor of Carry-Le-Rouet. In Antiquity, building materials were an important part of the maritime traffic, because conveyance on sea was less expensive than transportation on land. In 1983-84, the ship's cargo was raised and studied. It consisted of 24 monoliths, weighing on average close to a ton, and arranged symmetrically. They originated in the quarries of Ponteau-Lavera (Martigues, Bouches du Rhône). In order to study their inscriptions, stonemasons' markings, and traces of extraction on the stones were cleared. Several stones had Greek inscriptions, in particular the monograms alpha-rhô and gamma-alpha-rhô. The same markings can be found on the pink chalk remains of the Hellenic ramparts of Marseilles.

- The Fourmigue 'C' shipwreck:

In the beginning of the nineteenth century, the bottoms of the sea, of rivers and lakes, have surrendered numerous masterpieces of ancient sculpture, such as the Ephebe of Agde, to fishermen and divers. At the beginning of the first century BC, a Roman ship capsized near the Gulf of Juan, not far from the turret of La Fourmigue. It transported a magnificent cargo of pieces of furniture. Several of the pieces that were raised belonged to bronze beds that were decorated with finely carved sculptures. All these precious objects were probably commissioned to a Greek workshop (that assembled numbers in Greek) by a wealthy Roman living in the provinces.

- The Chrétienne 'A' shipwreck:

The ancient shipwreck Chrétienne (first century BC) lies close to the nautical beacon La Chrétienne. From it, numerous amphoras, one grindstone, as well as some parts of the ship's wood were raised. One exceptional piece was found at the site, a fairlead roller which, together with two other pieces of wood, seemed to have been used to handle the ropes attached to the anchor. Its conservation was secured by the freeze-drying treatment it underwent in the laboratory.

- Calanque de L'Âne - Roman vessel:

The still undergoing excavation work, is situated on the Eastern bank of the Frioul archipelago, in the Marseilles basin, at a depth of 18 meters. It transported a cargo of flat (tegulae) and round tiles (imbrices) in the late first century AD. The ship is in good condition, with the bottom of its hull largely preserved. It is of a particularly robust construction, with virtually all the framework made of oak, and with a very tight grating. Frame and carlingots were identified in the fore section of the boat. The step of its mast rests on two carlingots, longitudinal beams placed on either side of the vessel's axis. It is braced on either side of the step cavity with two pieces of triangular buttressing. These features are unprecedented by any other ancient shipwreck. The boat was constructed of oak and pine, and was probably 25 meters long. Beside its cargo of tiles, the ship also carried dishes for the sailors' daily use, like plates, jugs, bowls, some amphoras for food and drink, and glass containers. The archeological material also included pieces of ships' equipment, such as pulleys, leads, chainlinks, lead fishing weights etc. Two coins were served to complete the dating process that began with the study of pottery and glassware.

- Fos-sur-Mer – The Necropolis of Fos:

The shipwrecks and their cargoes are not the only underwater archaeological vestiges. Other finds include ancient dry land sites (the Cosquer Cave, for example), and harbour installations which are today submerged because of fluctuations in the sea-levels or tectonic deformations of the land. In the Gulf of Fos, an antique necropolis that was in use between the second and third centuries BC was discovered under four meters of water.

- Fos-sur-Mer - the 'Saint-Gervais 2' wreck:

It was discovered off Fos-sur-mer in 1978. A submarine salvage operation carried out that year and the subsequent study of artefacts dated the wreck in the VII Century A.D. and also revealed that the ship had been built using the "frame-first" construction method. This method has previously been found only on one other site, the Yassi Ada 1 wreck in Turkey. The latter method was less advanced than the one observed in the Saint-Gervais 2 wreck.

In fact, the bottom strakes were fitted onto the frames after the latter had been put in place. This is evident from the fact that the side planks are not attached to each other but are nailed directly to the ribs with iron nails, and from the strength of the longitudinal axis connecting all the timbers (floor timbers as well as half-frames) to the keel. The joints are reinforced using the same pins to fix a keelson which has been preserved at the stern and traces of which are visible at the bow, while keel plates fixed to the timbers support the mast-step in the centre of the ship. The Saint-Gervais

2 wreck is the only one that shows, through its cargo of wheat, that sea trading of that commodity existed. This trade, moreover, is heavily documented in Latin literature.

- Agay - 'A' shipwreck:

It was discovered at a depth of 50 metres during the 1970s by Alain Visquis who explored its cargo. Further exploration didn't take place till 1996 when a more specific puzzle was highlighted, on how the "shell-first" naval construction method used in Antiquity had gradually evolved into a "frame-first" construction method and, given the lack of geometric knowledge necessary for mathematical projections of the ship's design, what processes were used for this method of construction. This development is apparent from the early Middle Ages as seen in the Yassi Ada I wreck in Turkey and the Gervais 2 wreck described above. The main interest of the site lies in the study of the ship's construction and shape. It is a flat-bottomed ship, about 25 metres long and with a 4-metre beam. A "frame-first" construction method is suggested by the fact that the planking strakes are not connected, by the homogeneity of the framework through the keel/floor timbers, and even keel/half-timbers, the way the bilges are covered by half-timbers to compensate for the weakness of the joints between the floors and the futtocks.

- Cannes - the Batéguier shipwreck:

Off Cannes, at a depth of 58 metres lies a wreck which is in the same age as the Agay ones and of the same cultural origin, the Andalusian Caliphate of Cordova. In 1973 and 1974 the discoverer of the site recovered the main part of the cargo. It consisted of millstones, copper cauldrons, oil lamps and pottery seemingly transported in large, earthenware jars without handles, decorated most often with digitated friezes. In 1993, the site was evaluated because of the rarity of wrecks from this period and of this cultural type. As a result of this operation a piece of the hull, 11.35 m. long and 4.30 m. wide was freed. It is consistent with the underwater section of a flat-bottomed ship, its shape, which is rarely found in the Mediterranean, is reminiscent of that of the [Agay wreck](#) and the Serçe Liman one (Turkey, Xth Century A.D.). A geometric shaped mark is engraved on the keel; the sole strakes, the I-shaped ribs, the bilges and two other strakes beyond the westernmost bilge are all perfectly preserved. Examination of the construction (strakes nailed to the ribs with iron nails) revealed that a "frame-first" construction method was used.

- Villefranche-sur-mer - Lomellina shipwreck:

Ten years of excavations and nearly 4500 dives were necessary to study, analyze, and reconstruct the structure of a shipwreck at Villefranche-sur-mer, identified as the Genoese "nave" La Lomellina.

The ship sank in a hurricane on 15 September 1516, and was rediscovered in April of 1979, about 400 meters off the harbor basin of Villefranche, at a depth of 18 meters. Divers, archaeologists, and technicians were at work on it until September of 1991. The merchant ship was probably constructed in Genoa, and outfitted for a wealthy family of the city, the Lomellini. Its cargo was artillery, much needed in the Italian wars. Surprised by a violent storm while effecting repairs at Villefranche, the ship capsized and sank because it took on too much water. "Naves", ships with a large tonnage, were actually the backbone of the Genoese fleet. They ensured transportation of heavy cargoes on the Mediterranean, and with destinations in the North-West of Europe. The hull is intact, and in the center, one can see the pieces of artillery, the wheels of guncarriages, and the shots, as well as the powder storeroom in front contained 21 caskets.

- Villefranche-sur-mer - the Sainte-Dorothea wreck:

A merchant ship that sank in 1693, lies at a depth of 70 meters in the bay of Villefranche. It was explored with the submersible Remora. This single-place submarine was used by archeologists, since it allowed them to stay with the shipwreck for several hours at a time, to conduct general and specific observations. The ship is tilted towards the starboard, touching the seabottom. It seems to be in excellent condition because of the silt that covered it. Several of the cannons of the starboard battery are still in place, their muzzles resting on the planking and the opposing side, while other pieces of artillery have dropped slightly astern.

## **Languedoc-Roussillon**

- Collioure-Banyuls - L'Astrée, WWII:

The Astrée was originally a British ship, built in 1921. It was captured by the Germans in 1942. On May 1st 1944, on its way back from Egypt, the Astrée was torpedoed by the British submarine "Untering". The wreck currently lies at a depth of 38-42 meters, split in two parts.

- Collioure-Banyuls – Danish ship St. Lucien, WWII:

This ship was built in Denmark in 1920. It is a freighter used for transporting minerals and is 80meter long. It used to sail under British flag and was baptized all over again in Saint Lucien in 1941. In 1943, she was turned over to the Germans. This ship was also prey to a British submarine named "Unruly". It is situated right in front of Cape Bear.

- Collioure-Banyuls – freighter Saumur, WWII:

The Saumur is also a well conserved French freighter of 108 meters long, built in 1920. In December 1940, this ship was captured by the Germans to be torpedoed in 1944 by the British submarine "The Upstart". It is the largest wreck in the region, lying at a depth of 35-42 meters.

- Gulf of Lions - Arles IV, roman ship I century AD:

This site, was discovered in October 1988 by the submarine Cyana, and subsequently appraised by DRASSM in March of 1990. It is located in the Gulf of Lions, about 40 nautical miles (74 km) from the mouth of the Rhône. In 1993, it was the object of an archaeological expedition called Nautilion. The ship, originating in Bétique, in the South of Spain, sank between 25 and 40 AD. It has gradually been "digested" by the sea. What remains is a vast field of amphoras, extending about 30 meters in length and 10 meters in width. A virtual excavation counted circa 950 amphoras. However, the height of the barrow suggests that they were deposited in several layers, and that the ship actually transported between 1000 and 2000 items. Pottery and copper ingots complete the ship's cargo.

- Island of Levant - The ancient wreck of the Titan:

It is situated at a depth of 27 to 29 meters at the edge of the Island of Levant. It was discovered by Doctor Piroux, and after undergoing an initial examination in 1954, it was excavated by Philippe Tailliez, a frigate captain at the time, with the physical assistance by the French Navy. Coming after the excavation of Grand Congloué, the work on the Titan is considered as the first scientific excavation of a shipwreck. After the proper excavation, a diagram of the site and the wreck was produced. For the first time, a complete vertical photographic coverage of an underwater site was undertaken, and the recovered objects were catalogued according to coordinates put down on the ocean floor.

What remained of the cargo at the onset of the excavation were 700 amphoras of two types (Dressel 10 and 12) containing pickled fish (principally tuna), and one containing almonds. Numerous objects were recovered, like the common and black lacquered pottery, copper containers, oil lamps, tiles, grain mills, leaden anchor stocks, some coins, among them the votive coin placed in a hollow of the mast's step, with which the vessel could be dated to the first century BC. The disengaged remains of the hull measured 20 X 4 square meters. It consisted of membranes on a double-sided hull that were assembled with a traditional system of mortise and tenon. A complete elevation of the keel and the remains of the hull were constructed.

- The Port-Vendres II shipwreck:

The cargo of this ship in Port-Vendres (Pyrénées-Orientales) gives a particularly comprehensive image of the Spanish exportations in the middle of the first century of

our era. Composed of wine, oil, salted fish, copper, lead and tin bars from Extremadura, it also illustrates the importance of the Guadalquivir to export the production of this region of the Iberian Peninsula. The tin bars turned out to be particularly interesting. The interpretation of one of the inscriptions present on their flat side, allows to situate the time of their production between 41/42 and 48 AD. Moreover, they represent the well dated first proof of the exploitation and trade of Spanish tin by Rome. The material discovered during this excavation also allows the apprehension of life and work on board. Findings of ceramics, pieces of metallic crockery, toilet implements and tools acted as evidences on how the sailors' life was like in the antiquity.

- Agde - the 'Brescou 2' shipwreck:

Registered in 1995, this was where a royal navy ship belonging to the first half of the XVIIth Century lightened itself by unloading artillery and arms. In fact, no evidence was found of a shipwreck, whereas two swivel gun bases, perfectly aligned on a south-east/ north-west axis, from the shore of Brescou Islet (off Cape Agde) and the mainland, were found about 30 metres apart. Thirty metres beyond them, 29 matchlock muskets and flintlock blunderbusses were found and, finally, at some distance, metal hoops indicating three barrels. This type of armament is typical of the artillery used on galleys. Nothing was found to indicate whether the ship had sank in spite of having been lightened, or whether it had gone aground on the nearby shore. This is the first discovery of such a large collection of the artillery and armament of a Royal Navy ship from the first half of the XVIIth Century.

## Brittany

- Glenan - 'Alja Wreck':

It was a 43m long Netherlandish cargo that sank on February 18<sup>th</sup>, 1940. The boat is broken in two parts, with the poop set upside down. The wheel is still out of the sand, as well as the safety wheel.

- Morbihan gulf - 'La France':

It was a 165m long French cruiser which sank on August 26<sup>th</sup>, 1922 around 1 am after hitting on a reef in La Teignouse strait. The average depth is 17 meters.

- Morbihan gulf - 'Angers Wreck':

It sank on November 4<sup>th</sup>, 1918 and it's now found in 18 meters depth, covering a surface of 76 x 13 sqm.

- Le Croisic - Portnichet - 'Laos Wreck':

The Laos was a 135m long French steamer. It sank on February 8<sup>th</sup> 1907, since it broke into two parts.

- Douarnenez - 'La Meuse':

It was a warship vessel which sank probably in October 1954 after being the training target for Jean Bart vessel. Its length was 78m and its width was 10m.

- Groix - 'Sperrbrecher 134':

This ship were built in July 1909 in Bremen and was used as merchand ship untill the war began in 1939. His role was to escort the U.boat and the ship at the entrance of the Lorient harbor. It was sank by a British air-raid on August 8th, 1944.

- Groix - 'U 171 Wreck':

It sunk on 9th October, 1942 in the Bay of Biscay, near Lorient, after being hit by a British mine. Since 1999, it is forbidden to dive inside the wreck following the demand of the 'German Submarines Friends Association' which want to make a memorial of the wreck.

- Le Croisic - Portnichet - 'Le Ville de Rochefort':

The Ville de Rochefort sank in 1933, after being hit by a British vessel. Its cargo was 90m long. it had two large anchors at the bow and a spare wheel on the front deck.

- Saint Malo (Brittany North) – the WWII wrecks:

Fetlar: At 28 meters ddepth

Fremur: At 25 meters depth

Hilda: At 25 meters depth

Hinrich: At 36 meters depth

Laplace: At 25 meters depth

Ro21: At 20 meters depth

- Belle-ile - 'Elisabethville Wreck':

The ship was built in 1910 at Glasgow, by Stephens & Son Ltd. She was a 127m long and 16m wide steamer boat. This Belgium vessel sank on Septembre 6th, 1917 at 15h. She was torpedoed by the German U-Boat UC71.

- Belle-ile - 'L'Hanan':

It was a Dutch fishboat that was sank on July 28th, 1944. Its size had the following dimensions: 30m x 6m x 2.50m.

## Aquitaine

- Arcachon bay - 'Le Bateau en Ciment':

This wreck probably sank at the end of 1940. It is a 50m long wreck broken into 3 parts, lying at -22 meters on a sandy seabed.

- Arcachon bay - 'Le Chariot':

This wreck is a barge that was used to build a pipe from the coast (the warf). It sank with the crane, so one can see caterpillars and a lot of pipes.

- Arcachon bay - 'Le Cote Bleu':

This fisherman boat sank on June 22nd, 1976.

- Arcachon bay - 'Le Jean-Pierre':

It is an old trawler, which sank in 1969. It is linked by a chain to two other wrecks, the Renè-Hervè and the Perle, 17 meters deep.

- Arcachon bay – other wrecks:

'Le Point Zero', Arcachon bay, Aquitaine: At 21 meters depth

The 'Christian Yann wreck', Arcachon bay, Aquitaine: At 22 meters depth

The 'George Andrè wreck', Arcachon bay, Aquitaine: At 20 meters depth

The 'Golf 56 wreck', Arcachon bay, Aquitaine: At 20 meters depth

'The Mami Madi wreck': At 18 meters depth, its is an approximately 15m long wreck, which sank under bad weather conditions.

The 'Marie-Noëlle wreck': This wreck is located 150m north from the Saint Yves entrance. It is possible to reach the wreck from the shore.

- Gironde - 'Le Frigolin':

The 60m long auxiliary Kriegsmarine fishboat is based at Saint Jean de Luz. It sank in 1943.

- Gironde - 'Tarantini submarine':

During the Battle of the Atlantic, the Italian submarine "Capitano Tarantini", returning from North Atlantic patrol, was torpedoed and sank by the British submarine "HMS Thunderbolt" on December 15<sup>th</sup>, 1940 in the Bay of Biscay. It was 76 metres long and 7 metres wide.

Landes - 'L'Anjou': A 1<sup>st</sup> world war wreck, located at 42 meters deep.

## **Normandy**

In the cold and murky waters off Normandy, there are hundreds of historic wreck dives. The D-Day landing sites along the Brittany beaches are the final resting places of many vessels that sank just offshore. There are literally hundreds of ships that sunk during that fateful time in 1944. Most of the wrecks are accessible to divers in waters of 25 meters or less.

Arromanches is also the name of the iconic beach of D-Day known as Gold Beach. Arromanches Les Baines, the town, is a tourist destination and also the destination for scuba divers to explore WWII wreck dive sites.

Two of the famous wrecks to dive include parts of two UK cargo ships, the Empire Flamingo and the Lynghaug. The water does not offer ideal temperatures for diving, nor is the visibility high, but the experience of diving where D-Day occurred makes this trip memorable and perfect for the serious wreck diver.

A visitor can dive at the wreck of the American troopship called the Susan B Anthony, which sank on June 7th, 1944 by a mine explosion just offshore. The ship lies at a depth of 30 meters off Omaha Beach with some of its structure at only 20 meters deep.

Not all Brittany wreck dives sank during WWII. The British WWI steamboat known as USSA was a cargo vessel sank in 1917 after a mine exploded just off Cherbourg, France. The vessel is nearly intact, though broken into three parts, and it lies in the path of a busy shipping channel in strong waters at only 27 meters depth. Most who dive the USSA embark on a dive boat from nearby Cherbourg.

All the information related to the described sites and wrecks have been found in:

<http://diveadvisor.com/france>

<http://divescover.com/>

<http://www.culture.gouv.fr/culture/archeosm/archeosom/en/.htm>

## **French Legislative Framework**

### **Code du Patrimoine (Ordonnance n° 2004-178 du 20 février 2004)**

#### Title III, Chapter 2, maritime cultural goods

##### Article L532-1

Every deposit, shipwreck, remain, or in general every artefact bearing prehistorical, archaeological or historical values, located in the public maritime domain or underwater in the nearby areas, is to be considered a maritime cultural good.

#### Article L532-2

Maritime cultural goods located in the public maritime domain, whose owner is not likely to be identified, belong to the Country.

Every person discovering a maritime cultural good is obliged to live it in place and to not harm it. By 48 hours from the discovery or the docking he is obliged to declare the discovery to the competent authorities.

#### **7 February 2013 – Ratification of the UNESCO 2001 Convention**



However, in 2016 the first Underwater Art Museum of Spain was inaugurated in Lanzarote (Canary Island). The underwater Museum Lanzarote called "Museo Atlántico", depth 12 meters, on sandy seabed area of 50 x 50 meters, is a tourist and cultural attraction for divers and scuba divers. It has been conceived as a place to promote education in defence of the oceans and preserve and protect the marine and natural environment as an integral part of the system of human values. The museum is created as a huge artificial reef built with environmentally friendly neutral pH materials designed to adapt to endemic marine life so, over time, will help the marine biomass flourish and facilitate the reproduction of species on the island. Jason deCaires Taylor has created ten installations that aspire to reflect the contemporaneity and we pass some questions on the use of the natural resources. They are mysterious underwater worlds where art evolves as a consequence of the effects of nature. A connection between humans and nature, present in the work of the artist, with a romantic and apocalyptic touch that questions our future.

<http://www.cactlanzarote.com/en/cact/the-underwater-museum-lanzarote-museo-atlantico/>

On the other hand, there are not archaeological diving parks open all year in Spain. However, some archaeological sites are open a few weeks a year while the archaeologists make their excavations. Visits are organized so that the sport divers can see on live underwater archaeologists working in some emblematic sites. In recent years, we can highlight these activities:

### **Center of Underwater Archeology of Catalonia**

The Center of Subaquatic Archaeology of Catalonia, known as the CASC (Centre d'Arqueologia Subaquàtica de Catalunya), form a part of the Archaeological Museum of Catalonia (Museu d'Arqueologia de Catalunya). From the beginning of the 21st century this institution promotes activities to public access to in situ underwater cultural heritage.

The first one was called "Una Capbussada al passat" and its objective was "Discover the underwater world of Empúries". Empúries is an emblematic site because of its scientific interest (the Greek and Roman city) and the large number of visitors it receives. Through this aquatic activity, during the months of July and August, the visitor discovered the submarine remains of part of the city and its port infrastructures. First, in reception center on land the monitors explained to the visitors the port activity of the city and then guided the visitors on a surface tour between three buoys that marked the cyuito and served as rest stops. As a snorkeling activity was accessible to all types of public, family, youth and adult.

Currently the CASC offers the activity “Discover an underwater site”, from July to September, Monday to Friday. These visits are guided, by the hand of underwater archaeologist, to the sites in which the CASC is investigating and excavating. After a visit to the working ship and a brief explanation of its operation, a dive is offered to discover the site and work techniques of archaeologists. Prior reservation, diving and insurance certification are required for the participants. In recent years the visitors have been able to dive in important sites as “Cap del Vol” or “Cala Cativa I” from Roman times and “Deltrebe I” or “El Triunfante” from Modern times. (<http://www.mac.cat/eng/Seus/CASC/Activitats/Nova-oferta-d-activitats>).

### **Underwater Trail – Bou Ferrer (La Vila Joyosa, Alicante)**

The underwater visits to the Bou Ferrer are an unique opportunity to contemplate on live the largest Roman merchant ship in excavation in the Mediterranean, shipwrecked in the second half of the s. I A.C. in front of the old Allon (Villajoyosa) with a load of about 3,000 amphoras, full of fish sauces (one of the most valuable goods of the time) and lead ingots with marks that prove that they were personal property of the emperor, probably Nero (<http://www.vilamuseu.es/proyecto/bou-ferrer/4>).

The project is promoted by the Department of Education, Culture and Sport of the Generalitat Valenciana, which finances the scientific project and authorizes visits; by the University of Alicante through its General Foundation, which coordinates the work; by the Town Council of Villajoyosa, through the Department of Historic Patrimony, responsible for visits to the laboratories of Vilamuseu and all the conservation, restoration, diffusion and exhibition of the pieces; and the Nautical Club of Villajoyosa, which provides its facilities and staff. The local diving company Alisub organizes the logistics of the dives and contributes the own infrastructure of its dive centre.

With these underwater visits, the project acquires a pioneering cultural diffusion dimension in the Spanish State, since it is the first old wreck in which a public experience of this type is realized. It is also an initiative within the so-called "tourism of experiences", which reinforces the value and the image of the tourist brands of the south of the Valencian Community. Excavations and underwater guided visits to the Bou Ferrer wreck are one of the pillars of the Underwater Archeology Plan of the Valencian Community. This plan is committed to the integral management of the underwater archaeological heritage, so that it becomes a cultural and economic motor, in close relation with tourism and sport, in this case to position the Vila Joiosa as a reference destination in scuba diving Experiential and consolidate it as one of the main cultural tourism destinations on the Costa Blanca.

## Guidelines

In 2005 Spain was one of the first countries to ratify the UNESCO Convention of 2001 on the Protection of the Underwater Cultural Heritage, acquiring thus a permanent commitment to the defence and study of this important set of goods of our Cultural Heritage.

### **National Plan for the Protection of the Spanish Underwater Cultural Heritage - 'Green Paper'**

In 2007 the Spanish Council of Ministers approved the “National Plan for the Protection of the Spanish Underwater Cultural Heritage, in order to translate this commitment into a set of effective and well-planned actions in Spanish territory. The Council of Historical Heritage that includes all the Autonomous Communities accepted this Plan prepared by the Ministry of Culture. The Plan discussed the main lines to be carried out in Spain for the protection of Underwater Cultural Heritage.

The Green Paper provides the tools for achieving the objectives of the National Plan which provides for a Decalogue of measures ranging from documentation and inventory of underwater archaeological heritage to the physical and legal protection of the most emblematic underwater archaeological sites on our coast, through training in this field, and collaboration agreements with the Ministries of Defense, Interior and Foreign Affairs.

The Green Paper was prepared in 2009 by a committee of experts made up of representatives of the Ministry of Culture (through the General Subdirectorate for the Protection of Historical Heritage and the National Museum of Underwater Archaeology- ARQVA), the Autonomous Communities and Universities, in order to analyze the situation of underwater archeology in Spain and establish guidelines and programs for the management of this heritage. In chapter 8, dedicated to dissemination, we wish to highlight the following priority actions:

- “Encourage the creation of *Underwater Archaeological Parks* in Spanish coastal waters which, in compliance with the mandate set out in the 2001 UNESCO Convention, permit and promote the responsible access of citizens to this important part of Cultural Heritage”.
- “Help define and implement quality tourist routes focusing on Underwater Cultural Heritage combined with Terrestrial Maritime Heritage”.
- “Work together with the Autonomous Communities to create and manage *Educational Classroom* at especially coast and include archaeological sites suited for visitors”.

The digital publication of the Green Book is available online at the following links:

\* Libro Verde. Plan Nacional de Protección del Patrimonio Cultural Subacuático Español (<http://www.mecd.gob.es/mnarqua/dms/museos/mnarqua/patrimonio-cultural-sub/plan-nacional/verde.pdf>)

\* Green Paper. National Plan for Protection of Spanish Underwater Cultural Heritage <http://www.mecd.gob.es/mnarqua/dms/museos/mnarqua/patrimonio-cultural-sub/plan-nacional/verde-ingles.pdf>

## ***Spanish Legislative Framework***

### **Current legislation about cultural heritage safeguarding**

- **Instrument of Ratification of the Convention on the Protection of Cultural Heritage Underwater**, made in Paris on November 2, 2001 (Official State Bulletin, March 5, 2009). UNESCO Convention on the Protection of the Underwater Cultural Heritage (Paris, 2 November 2001) was ratified by the Spanish Government on May 25, 2005 and became effective in Spain on January 2, 2009 when this Convention came into force in general form in accordance with the provisions of Article 27 thereof. However, the Spanish Instrument of Ratification of this Convention was not published in the Official State Bulletin until March 5, 2009.

<https://www.boe.es/boe/dias/2009/03/05/pdfs/BOE-A-2009-3787.pdf>

- **Law 16/1985**, dated 25 June, **on the Spanish Historical Heritage** (Official State Bulletin of 29 June 1985).

This law dedicates its Title V to the Archaeological Heritage. Regardless of its location on land, underneath the ground or underwater, the same principles are adopted on the research and the safeguarding of archaeological heritage underneath the ground and Underwater Cultural Heritage in Spain. See mainly Articles 40.1, 41 and 44.

[http://www.unesco.org/culture/natlaws/media/pdf/spain/spa\\_ley\\_16\\_1985\\_spaprof.pdf](http://www.unesco.org/culture/natlaws/media/pdf/spain/spa_ley_16_1985_spaprof.pdf)

- **Royal Decree 1508/2008**, of 12 September, regulating the **National Museum of Underwater Archeology** (Official State Bulletin 248, 14 October 2008).

This Royal Decree regulates the National Museum of Underwater Archaeology and defines its purposes, functions, headquarters, collections, governing bodies, etc.

<http://www.boe.es/boe/dias/2008/10/14/pdfs/A41176-41178.pdf>

- **Order of April 20, 2009**, which resolved to declare 42 defined areas as **Archaeological Reserves** in the continental and inland waters of Andalusia, territorial sea and continental shelf along the Andalusian territory (Official Andalusian Bulletin 101, 28 May 2009). This Order declare 42 underwater areas as Archaeological Reserves, in which archaeological remains are presumed to exist and prevention measures are considered necessary. That means that these areas have a preventive protection as areas of archaeological reserve.

[file:///D:/PCS%20en%20aguas%20continentales/Andalucia/BOJA%20101\\_2009\\_Zonas%20de%20Servidumbre%20Arqueológica%20subacuaticas.pdf](file:///D:/PCS%20en%20aguas%20continentales/Andalucia/BOJA%20101_2009_Zonas%20de%20Servidumbre%20Arqueológica%20subacuaticas.pdf)

- **Decree 285/2009**, of 23 June, which registers in the General Historical Heritage Catalogue of Andalusia as Heritage of Cultural Interest, under the classification of **Archaeological Zone**, 56 sites located in continental and inland waters of Andalusia, Territorial sea and coastal continental shelf to the Andalusian territory (Official Andalusian Bulletin 101, 6 July 2009).

This Decree declare 56 underwater areas as Archaeological Zones, spaces in which the existence of archaeological remains of relevant interest is proven. That means that these areas have the maximum protection as Heritage of Cultural Interest.

[file:///D:/PCS%20en%20aguas%20continentales/Andalucia/BOJA%20129\\_2009%20Zonas%20Arqueológicas%20subacuaticas.pdf](file:///D:/PCS%20en%20aguas%20continentales/Andalucia/BOJA%20129_2009%20Zonas%20Arqueológicas%20subacuaticas.pdf)

## Specific legislation about marine natural areas

- **Instrument on ratification of the United Nations Convention on the Law of the Sea**, done at Montego Bay on 10 December 1982 (Official State Bulletin, February 14, 1997). The UNC Law of the Sea (Montego Bay, 10 December 1982) was signed in 1984 by Spain and became effective on February 14, 1997 in Spain, when the Spanish instrument of ratification was published was published in their Official State Bulletin.

<https://www.boe.es/boe/dias/1997/02/14/pdfs/A04966-05055.pdf>

- **Law 41/2010**, of 29 December, **on the Protection of Marine Environment** (Official State Bulletin, December 30, 2010).

<https://www.boe.es/boe/dias/2010/12/30/pdfs/BOE-A-2010-20050.pdf>

## NORTH AND BALTIC SEAS



*Figure 16: Map of Scandinavia*

### FINLAND

#### FINLAND, Helsinki Underwaterpark Kronprins Gustav Adolf

Located in the water area of the City of Helsinki, approximately 3.5 nautical miles to south-southwest from the Harmaja lighthouse. The coordinates of the park are (WGS84) 60°03.010 N, 24°55.445 E.

Cultural heritage and site: the wreck of the Kronprins Gustav Adolf, which sank off Helsinki in 1788. The wreck is a Swedish 62-cannon ship of the line that ran aground on an uncharted rock during the wars of King Gustav III in 1788. The ship's remains lies at a depth of 18–20 metres on a flat bed of moraine and is partly scattered over an

area measuring approximately 100 x 100 metres. The wreck consists of the bottom of the hull, the sides, which have fallen down, different parts of the structure, cannons, cannon balls, and a variety of loose articles. All in all 71 cannons have been found at the site. Three of these were raised, conserved and examined. There are also two big anchors at the wreck. There are 13 information signs at the site. No special permission is needed for diving at the park. For more information visit: [http://www.nba.fi/en/cultural\\_environment/archaeological\\_heritage/underwater\\_cultural\\_heritage/underwater\\_park](http://www.nba.fi/en/cultural_environment/archaeological_heritage/underwater_cultural_heritage/underwater_park)

<http://www.metsa.fi/documents/10739/11431/Kronprins%20Gustav%20Adolf%20underwater%20park.pdf><http://www.metsa.fi/documents/10739/e13fb58a-d6d7-4837-93af-fe8a6186db34>

For more information about the Nordic Blue Parks Project see:

Nordic Blue Parks, Nordic perspectives on underwater natural and cultural heritage K. O'Brien, S.Tikkanen, C. Lindblad, P.Flyg, A. Olsson, O.Uldum, I. Aarestad, and D. Nævdal, online at: <http://www.diva-portal.org/smash/get/diva2:700574/FULLTEXT01.pdf>

and [http://www.academia.edu/27704615/By\\_several\\_authors\\_Nordic\\_Blue\\_Parks\\_-\\_Nordic\\_perspectives\\_on\\_underwater\\_natural\\_and\\_cultural\\_heritage](http://www.academia.edu/27704615/By_several_authors_Nordic_Blue_Parks_-_Nordic_perspectives_on_underwater_natural_and_cultural_heritage)

## DENMARK

**DENMARK, The Højklint site underwater trail ( located in the waters around Southern Fyn, Funen)**

Cultural heritage and site: The trail tells about the submerged Stone Age landscapes and consists of 7 stations, each with a text explaining either a subject from the archaeological or the natural historical side of it, safe and easy dive in good visibility at the maximum depth of three meters. For more information visit:

<http://www.metsa.fi/documents/10739/11431/Hojklint%20report.pdf>  
<http://www.metsa.fi/documents/10739/db06376d-2c17-4667-9282-7b8f4eb16388>

## SWEDEN

**SWEDEN, Dalarö Model (located at The Dalarö archipelago, southeast of Stockholm)**

Cultural heritage and site: a great number of well-preserved shipwrecks from the 17th and 18th centuries are found here. Dalarö Model is based on the idea of controlled access to protected shipwreck sites, it is a concept developed by the Swedish National Maritime Museums. Divers will get a permission to dive on the wrecks when accompanied by a licensed underwater guide. The guide has relevant competence and

training to educate the divers on the cultural heritage of the area and the shipwrecks. Also non-divers can enjoy the underwater cultural heritage in real-time experience onboard charter boats equipped with ROV's. In addition, digitally enhanced movies and animated reconstructions of ships can be made for display on widescreen television and on movie screens. For more information visit:  
<http://www.machuproject.eu/news/news-32.htm>  
<http://www.unesco.org/new/en/culture/themes/underwater-cultural-heritage/divers/nordic-blue-parks/>  
<http://www.xray-mag.com/content/dalar%C3%B6-marine-archeological-wreck-park>

### **SWEDEN, Axmar underwater park (located in Axmar )**

Cultural and natural heritage and site: In the park, it is possible to enjoy both nature and culture. The many shipwrecks of the park are located mainly in the shallow waters and they can be visited by divers, boat tourists, canoeist and some of the sites can be seen even from the shores. In addition, Axmar is a nature preserve and marine protection area which adds the importance of the underwater park. For more information visit:  
<http://www.lansstyrelsen.se/gavleborg/SiteCollectionDocuments/Sv/publikationer/2014/Axmar-ENG-webb.pdf>  
[http://www.xray-mag.com/pdfs/articles/Travel\\_Sweden\\_36.pdf](http://www.xray-mag.com/pdfs/articles/Travel_Sweden_36.pdf)

## **NORWAY**

### **NORWAY, The Lossen Trail (located on the west side of Outer Hvaler National Park)**

Cultural Heritage: the frigate Lossen (28,7 m. long, 7,5 m. wide) which served in the Danish fleet during "the Great Northern War" (1700-1721) is found here. The ship was smashed against cliffs during a storm and sank off in 1717. For more information:  
<https://www.visithvaler.com/frontpage/2014/10/30/underwater-cultural-heritage>

Site: there is an underwater path that goes around the frigate Lossen who lays at a depth of six meters; the path includes no interference to the seafloor since signs are created in stone slabs that lay on the seafloor. Between the signs, there is a line that is attached to the granite blocks, so that divers and snorkelers are easily guided from sign to sign. The trail consists of five signs with the following topics: ship construction, ship's armament, cultural heritage law, flora and fauna. For more information:  
[http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CLT/pdf/Tikkanen\\_paper.pdf](http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CLT/pdf/Tikkanen_paper.pdf)

## UNITED KINGDOM



*Figure 17: map of United Kingdom*

### Scotland

#### **Scapa Flow (located on the Orkney Islands off Scotland's Northern coast)**

Cultural heritage and site: Orkney has a unique underwater environment, from vast battleships resting in the heart of Scapa Flow, to smaller blockships dotted along the rugged coastline. The wreck dives here include three 177 metre battleships and four 155 metre cruisers. For more information about the wrecks visit: <http://www.scapaflowwrecks.com/wrecks/>

In addition there is a whole fleet of dive boats operating in the Scapa Flow area, covering all the main dive sites and many more. For more information visit: <http://www.scapaflowwrecks.com/>

#### **The Duart Wreck Diver Trail (west coast of Scotland)**

Cultural heritage and site: the wreck probably dates to 1653 and may be that of the Speedwell, a small Cromwellian vessel lost following operations against the MacLeans of Duart. The trail is laid out using a series of floating tags. Each feature has a small float attached to it by a length of cord which rises just above the kelp level. A number is attached to the float to identify the cannons, and a floating 'A' identifies the position of the anchor.

All seven cannons and the anchor have been marked with these floating numbers, and a start point for the trail is accessed via a simple shore transit. This enables divers to navigate their way around the marked positions, using the trail map as a guide to help them visualise the main features and layout of the wreck. For more information visit: <https://www.nauticalarchaeologysociety.org/duart-wreck-diver-trail>

For a trail map visit:

[https://www.nauticalarchaeologysociety.org/sites/default/files/u9/DPVisitorTrail\\_forweb.pdf](https://www.nauticalarchaeologysociety.org/sites/default/files/u9/DPVisitorTrail_forweb.pdf)

### **Ireland**

#### **Killary Harbour (it is a fjord located on Ireland's west coast, beneath the mountains of Connemara)**

Cultural and natural heritage and site: the harbour has a depth of about 23 metres for most of its length and a maximum of 45 metres at its centre. The fjord is 16km long and over 45m deep. Diving is usually limited to the Mouth of Killary. However there is very little to see at depths greater than 25m. The more interesting way to dive Killary is by boat with several good sites within 10-15 minutes from the pier. For more information visit:

<http://www.killaryfjord.com/>

<http://www.goconnemara.com/localities/killary/>

<http://www.connemara.ie/en/content/killary/>

### **England**

#### **Stoney Cove (Leicestershire)**

Cultural heritage and site: the site offers diving for all capabilities with its 6m shelf, 20m drop and a 35m deep end with many underwater attractions, such as the Nautilus on the 6m shelf, the Staingarh and Defiant sunken wrecks on the 20m bottom and many others. Visibility is varied and can be as low as a couple of metres in the summer. For more information visit:

[https://www.nauticalarchaeologysociety.org/sites/default/files/u9/stoneycove\\_report.pdf](https://www.nauticalarchaeologysociety.org/sites/default/files/u9/stoneycove_report.pdf) <http://www.scuba-diving-adviser.co.uk/DiveSites/UKInlandDiveSites.aspx>

#### **Norman's Bay wreck diver trail (located in Norman's Bay, East Sussex, just south of Pevensey, near Eastbourne)**

Cultural heritage and site: it is a large warship of the period 1600-1800. Judging from the length of the visible remains, the vessel would have been approximately 40m (131 feet) long, with an approximate breadth of 12m (39 feet). The number and size of the armaments and the anchor suggests this was a third rate warship of 800 to 1000 tons. Recent research generously funded by English Heritage has led to a possible identity

for the wreck being proposed. The wreck site contains a cluster of at least forty-nine iron guns, timber hull structure and various other artefacts including a large anchor on top of a ballast mound. The dive trail was created in 2010 and launched in spring 2011. An underwater information booklet to guide divers around the site was designed that aids navigation and assist visitors in recognising features on the wreck. For more information about the dive trail visit:  
<http://www.nauticalarchaeologysociety.org/sites/default/files/u9/Norman%27s%20Bay%20Wreck%20dive%20trail%20guide%202013.pdf>

For more information about the wreck visit:  
<https://www.nauticalarchaeologysociety.org/content/normans-bay-protected-wreck-site>

### **Holland No. 5 Submarine (located about 6 miles (9.7 km) off the British coast near Eastbourne)**

Cultural heritage and site: the Holland No.5 submarine was the first submarine to actually be commissioned in the Royal Navy, on the 19th January 1903. In order to visit the wreck is possible to contact the NAS to schedule a visit. No NAS qualifications are required to visit the wreck, however for the Holland 5 the minimum Diving Qualification is BSAC Dive Leader / PADI Rescue Diver equivalent with recent dives to over 30m. For more information visit:

<https://www.nauticalarchaeologysociety.org/content/holland-no5-submarine>

### **The Coronation Wreck Project (Plymouth)**

Cultural heritage and site: the Coronation sank near Plymouth during a violent storm in 1691. She lay undiscovered until 1967 and eventually the site became a designated 'Protected Wreck' under the PWA 1974. There are two main areas of wreckage lying some 800 metres apart. The topography of the offshore site comprises of rugged rock formations and sand-filled gullies. It was discovered by magnetometer in July 1977 this is the site of the Diver Trail. The site is in a general depth of 18 – 20m and has some kelp and low-level vegetable turf covering the area. A large variety of marine life inhabits the site. The site has seventeen cannon and three anchors within it. For more information about the wreck visit:

<http://www.coronationwreck.org/history.html>

For a 3D virtual tour visit: <http://www.coronationwreck.org/tour.html>

### **The A1 Submarine (located in the eastern Solent, the strait that separates the Isle of Wight from the mainland of England)**

Cultural heritage and site: the wreck of the HMS m/A1 is a submarine that sank in the eastern Solent in 1911. The dive trail is organised and managed by the NAS in partnership with the Southsea branch of the British Sub-Aqua Club (SSAC). An

underwater information guide for divers visiting the site has been designed that will aid navigation and assist visitors in recognising features on the wreck. This guide will also explain the background to the remains and the issues of protecting and managing the wreck. For more information visit:

<https://www.nauticalarchaeologysociety.org/content/a1-submarine-0>

For the underwater guide of the wreck visit:

[https://www.nauticalarchaeologysociety.org/sites/default/files/u9/A1%20sub%20trail%20guide\\_final\\_0.pdf](https://www.nauticalarchaeologysociety.org/sites/default/files/u9/A1%20sub%20trail%20guide_final_0.pdf)

### **Cornwall**

#### **The HMS Scylla (located just 700m from the James Egan Layne in Whitsand Bay, South East Cornwall)**

Cultural heritage and site: the HMS Scylla, launched in August 1968, was the last naval warship ever to be built at Devonport Royal Dockyard in Plymouth. It enjoyed 25 years of service in the Royal Navy and then she was taken out of service in 1993 and sank as an artificial reef in 2004, with a depth of 24 m. Scylla is easily accessible by boat from Plymouth or South East Cornwall. There are no permanent mooring buoys on the wreck so obtaining local knowledge of the wreck is highly advisable. All of the licensed dive charters operating in the area know the wreck very well and will be able to provide not only safe boat access but essential safety briefings and advice about diving Scylla Reef. From 2014 the interior of the wreck was regarded unsafe for diving. For more information about the wreck visit:

<http://www.divescylla.com/hms-scylla> <http://www.divescylla.com/diving-scylla>

#### **The barque Hera (north of Gull rock, east Falmouth)**

Cultural heritage and site: the wreck of the four-masted german barque Hera, was built in 1886 and wrecked behind Gull Rock to the east of Falmouth at the start of 1914. At 16m deep, the Hera is an ideal wreck for beginners and training divers. Diveable pretty much at any state of the tide, it also makes a great second dive to follow a deeper offshore wreck on slack water. The wreck is in two main sections about 20m apart, separated by the masts laying on the sea bed.

For more information about the wreck visit:

<http://www.submerged.co.uk/hera.php>

<http://www.wrecksite.eu/wreck.aspx?77352>

#### **The Caroni River (Falmouth Bay)**

Cultural heritage and site: the Caroni River was a large oil tanker that sank in January 1940 after striking a magnetic mine. Due to its position, it was a hazard to navigation and was flattened by explosives. Today it lies completely broken and in three sections,

close together on a sandy bottom with a minimum depth of 17m. The visibility is good, usually twenty feet and the wreckage is scattered over a very large area. For more information visit:

<http://www.wrecksite.eu/wreck.aspx?5043>

<http://www.submerged.co.uk/caroni.php>

For more information about the Falmouth Bay wrecks visit:

<http://www.atlanticscuba.co.uk/guides/Falmouth%20Bay%20Wrecks.pdf>

### **SS James Eagan Layne (Whitsand Bay)**

Cultural heritage and site: the SS James Eagan Layne was a liberty ship that was beached and sank during the Second World War. It lays at a depth of 24 meters. For more information visit: <http://www.submerged.co.uk/jameseganelayne-wreck.php>

<http://duo-divers.com/images/guides/1373.rw.14.pdf>

[http://www.divesitedirectory.co.uk/dive\\_site\\_uk\\_england\\_southwest\\_wreck\\_james\\_egan\\_layne.pdf](http://www.divesitedirectory.co.uk/dive_site_uk_england_southwest_wreck_james_egan_layne.pdf)

For a 3D photo map of the wreck visit:

<http://fourthelement.com/adventures/wreck-tours/james-egan-layne/>

### **HMS Elk (located on the south of the breakwater, Plymouth)**

Cultural heritage and site: the Elk is a wreck of an old trawler that was used as a fishing boat and sank after hitting a mine in 1940. It lies in approximately 15-25 m of water, sitting upright on the sandy bottom. There are clear signs of damage on the port side offering chance to penetrate for experienced divers. The wreck is marked by two buoys and can easily be circumnavigated. For more information visit:

<http://www.submerged.co.uk/elk-trawler.php>

<http://www.wrecksite.eu/wreck.aspx?534>

<http://www.plymouthdivers.org.uk/hmselk.html>

### **SS Mohegan (Lizard Peninsula)**

Cultural heritage and site: the SS Mohegan was Victorian steamship who hit The Manacles ( rocks ) in 1898 causing the loss of 106 people. The site is marked by a simple cross. The wreck is an unforgettable dive, with the bow in some 15m and the remainder in 29m. The ship lies on the seaward side of Carn du Rock and any dive planned for this area should be on slack water.

For more information about the wreck's history visit:

<http://www.mcgonagall-online.org.uk/gems/the-wreck-of-the-steamer-mohegan>

<http://www.submerged.co.uk/mohegan.php>

<http://www.wrecksite.eu/wreck.aspx?561>

### **HMS Colossus Dive Trail (Cornwall-Isles of Scilly)**

Cultural heritage and site: the HMS Colossus was a Courageux class 74 gun warship built in 1787 at Gravesend and wrecked off Samson in the Isles of Scilly in 1798. The 74 gun ship was one of the most successful types of the period. They were typically about 51m in length with a crew of over 600. The dive trail consists of numbered observation stations situated around the site and a waterproofed underwater information booklet which guides divers between the observation stations, explaining the exposed remains and detailing brief background information on the wreck. For more information visit: <http://www.cismas.org.uk/colossus-dive-trail.php>  
<http://hmscolossus.cismas.org.uk/> For a 3D interactive diving trail visit:  
<http://hmscolossus.cismas.org.uk/start-the-dive-trail/>

### **The Gipsy (located just off of Dowderry, a coastal village in southeast Cornwall)**

Cultural heritage and site: the Gipsy ( originally named “The Rodney”) was an iron full-rigged ship built in 1874 who sank off in 1901 with a cargo of nitrate. Then it was blown apart by explosives because she had become a hazard to local fishing vessels. Parts of the wreck are strewn over a large area in about 7 to 8 metres (23 to 26 ft) of water.

### **CORNWALL, The Eastfield (located off Dodman Point, south Cornwall coast)**

Cultural heritage and site: the SS Eastfield was a steam ship which became a U-boat casualty of the First World War when she was torpedoed on November 1917. Parts of her are remarkably intact, although the wreck has been commercially salvaged, and she lies mostly upright in approximately 40-43m of water. In keeping with many merchantmen of the period, she carried a small gun on her stern. For more information visit: <http://www.wrecksite.eu/wreck.aspx?77370>  
<http://www.shipwreckconference.org/dox/IMASS%20No.8-SVC-15122014A.pdf>  
<http://www.ukdiving.co.uk/places/coastal/articles/cornwall2.htm>

### **The SS Helopes (located on the western side of Mounts Bay)**

Cultural heritage and site: the wreck is a 2,774 ton steamer Helopes which sank off in 1911 while she was carrying a cargo of coal. The wreck now lies in 32-34m of water on her side with the hull relatively intact and steel screw and rudder still in place. Tides are not much of a problem except on springs and the wreck is easily found on land marks (talk to the locals) and echo sounder as she stands up well from a sand and shale seabed at approximately at the following coordinates: Lat 50.02.5N Long 05.30.6W. For more information visit: <http://www.wrecksite.eu/wreck.aspx?1750>  
<http://atlanticscuba.co.uk/index.php/helopes/>  
<http://www.seasearch.org.uk/downloads/Cornwallsummary2007.pdf>  
[http://www.cismas.org.uk/docs/Mounts\\_Bay\\_Survey\\_Report.pdf](http://www.cismas.org.uk/docs/Mounts_Bay_Survey_Report.pdf)

**The SS Lincoln (approximately a mile and a half off St. Loys Bay to the west of Lamorna Cove)**

Cultural heritage and site: this is a wreck of an early steam sailer who sank off in 1886 after striking the Runnel Stone in thick fog and the majority of its remains can now be found in 28-35m of water on an attractive area of reef. In the site some salvage work is apparent and the major goodies are long gone, but interesting finds are still possible as the wreck is not often dived.

For more

information

visit:

<http://www.ukdiving.co.uk/places/coastal/articles/cornwall3.htm>

[http://www.cismas.org.uk/docs/Mounts\\_Bay\\_Survey\\_Report.pdf](http://www.cismas.org.uk/docs/Mounts_Bay_Survey_Report.pdf)

<http://www.shipwreckconference.org/dox/IMASS%20newsletter%209.pdf>

**The SS City of Westminster (around the Runnel Stone, a rock about 1 mile south of Gwennap Head)**

Cultural heritage and site: it was a cargo steamer ship built in 1916, which, while on its way from Belfast to Rotterdam, hit the Runnel Stone's rock and sank off in 1923. The remains of the ship now lie in 30 metres (98 ft) of water, jammed into a gully on the eastern side of the stone. The wreck site is actually consisted of only the bow section which came to rest on top of a previous wreck, the Moorview. The sterns exact position is unknown, but it is further out in about 50m of water.

For more information visit: <http://www.wrecksite.eu/wreck.aspx?528>

<http://www.divernet.com/wreck-tours/p301709-wreck-tour:-4city-of-westminster.html>

## INTERNATIONAL LEGISLATIVE FRAMEWORK

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Hereby is reported a summary of the most relevant International laws and European directives, guidelines and commitments concerning the safeguarding of both natural and cultural underwater heritage. The main principles, objectives and statement have been highlighted with regard to the overall aims of the BLUEMED objectives.

### International laws

**1976 - Barcelona Convention for the protection of the Mediterranean** (amended in 1995) concerning Mediterranean Specially Protected Areas and Biological Diversity in the Mediterranean, which provides for the establishment of a List of Specially Protected Areas of Mediterranean Interest (SPAMI List)

The Protocols drawn up in line with this Convention aim to protect and improve the marine and coastal environment in the Mediterranean, whilst promoting regional and national plans contributing to sustainable development.

#### ACTS:

- Council Decision **77/585/EEC** of 25 July 1977 concluding the Convention for the protection of the Mediterranean Sea against pollution and the Protocol for the prevention of the pollution of the Mediterranean Sea by dumping from ships and aircraft.
- Council Decision **81/420/EEC** of 19 May 1981 on the conclusion of the Protocol concerning cooperation in combating pollution of the Mediterranean Sea by oil and other harmful substances in cases of emergency.
- Council Decision **83/101/EEC** of 28 February 1983 concluding the Protocol for the protection of the Mediterranean Sea against pollution from land-based sources.
- Council Decision **84/132/EEC** of 1 March 1984 on the conclusion of the Protocol concerning Mediterranean specially protected areas.
- Council Decision **2004/575/EC** of 29 April 2004 on the conclusion, on behalf of the European Community, of the Protocol to the Barcelona Convention for the Protection of the Mediterranean Sea against Pollution, concerning cooperation in preventing pollution from ships and, in cases of emergency, combating pollution of the Mediterranean Sea.
- Council Decision **2010/631/EU** of 13 September 2010 concerning the conclusion, on behalf of the European Union, of the Protocol on Integrated Coastal Zone Management in the Mediterranean to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean.

<http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=URISERV:l28084&from=EN>

- **2001 UNESCO Convention on the protection of Underwater Cultural Heritage**

HIGHLIGHTS:

**Article 1 – Definitions:**

“Underwater cultural heritage” means all traces of human existence having a cultural, historical or archaeological character which have been partially or totally under water, periodically or continuously, for at least 100 years such as:

- (i) sites, structures, buildings, artefacts and human remains, together with their archaeological and natural context;
- (ii) vessels, aircraft, other vehicles or any part thereof, their cargo or other contents, together with their archaeological and natural context; and
- (iii) objects of prehistoric character.

**Article 2 – Objectives and general principles:**

‘1. This Convention aims to ensure and strengthen the protection of underwater cultural heritage.

2. States Parties shall cooperate in the protection of underwater cultural heritage.

3. States Parties shall preserve underwater cultural heritage for the benefit of humanity in conformity with the provisions of this Convention.

4. States Parties shall, individually or jointly as appropriate, take all appropriate measures in conformity with this Convention and with international law that are necessary to protect underwater cultural heritage, using for this purpose the best practicable means at their disposal and in accordance with their capabilities.

5. The preservation *in situ* of underwater cultural heritage shall be considered as the first option before allowing or engaging in any activities directed at this heritage.

6. Recovered underwater cultural heritage shall be deposited, conserved and managed in a manner that ensures its long-term preservation.

7. Underwater cultural heritage shall not be commercially exploited.

8. Consistent with State practice and international law, including the United Nations Convention on the Law of the Sea, nothing in this Convention shall be interpreted as modifying the rules of international law and State practice pertaining to sovereign immunities, nor any State’s rights with respect to its State vessels and aircraft.

9. States Parties shall ensure that proper respect is given to all human remains located in maritime waters.

10. Responsible non-intrusive access to observe or document *in situ* underwater cultural heritage shall be encouraged to create public awareness, appreciation, and protection of the heritage except where such access is incompatible with its protection and management. [...]

## **Article 6 – Bilateral, regional or other multilateral agreements**

1. States Parties are encouraged to enter into bilateral, regional or other multilateral agreements or develop existing agreements, for the preservation of underwater cultural heritage. All such agreements shall be in full conformity with the provisions of this Convention and shall not dilute its universal character. States may, in such agreements, adopt rules and regulations which would ensure better protection of underwater cultural heritage than those adopted in this Convention.

2. The Parties to such bilateral, regional or other multilateral agreements may invite States with a verifiable link, especially a cultural, historical or archaeological link, to the underwater cultural heritage concerned to join such agreements. [...]

<http://unesdoc.unesco.org/images/0012/001246/124687e.pdf#page=56>

## **European Union Directives, Protocols and Guidelines**

- **Directive 1992/43/EEC (Habitat Directive) on the conservation of natural habitats and of wild fauna and flora**

### HIGHLIGHTS

#### **Article 3**

1. 'A coherent **European ecological network** of special areas of conservation shall be set up under the title **Natura 2000**. This network [...] shall enable the natural habitat types and the species' habitats concerned to be maintained or, where appropriate, restored at a favourable conservation status in their natural range.
2. The Natura 2000 network shall include the special protection areas classified by the Member States pursuant to Directive 79/409/EEC.
3. Each Member State shall contribute to the creation of Natura 2000 in proportion to the representation within its territory of the natural habitat types and the habitats of species [...]. To that effect each Member State shall designate [...] sites as special areas of conservation taking account of the objectives set out [...].'

<http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31992L0043&from=EN>

- **2007 Guidelines for the establishment of Natura 2000 in the Marine Environment**

### HIGHLIGHTS

Chapter 2.2 - '[...] the Strategy adopted is based upon an ambitious new approach to the protection and management of marine ecosystems and promotes sustainable use of marine resources. It addresses major threats that were already

identified in a previous Communication: an inadequate framework for the management of the seas, given institutional and legal complexities and the number of actors concerned; insufficient basic knowledge, due to insufficient links between research areas in need of action and priorities; and lack of a dedicated policy. [...] This new approach develops an integrated policy towards the implementation of a single, integrated and coherent set of measures for the conservation and protection of the marine environment.'

[http://ec.europa.eu/environment/nature/natura2000/marine/index\\_en.htm](http://ec.europa.eu/environment/nature/natura2000/marine/index_en.htm)

[http://ec.europa.eu/environment/nature/natura2000/marine/docs/marine\\_guidelines.pdf](http://ec.europa.eu/environment/nature/natura2000/marine/docs/marine_guidelines.pdf)

- **Directive 2008/56/EC on establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive)**

#### HIGHLIGHTS

24. [...] Member States across a marine region or subregion should undertake an analysis of the features or characteristics of, and pressures and impacts on, their marine waters, identifying the predominant pressures and impacts on those waters, and an economic and social analysis of their use [...]

25. On the basis of such analyses, Member States should then determine for their marine waters a set of characteristics for good environmental status. [...]

26. The next step towards achieving good environmental status should be the establishment of environmental targets and monitoring programmes for ongoing assessment, enabling the evaluation on a regular basis of the state of the marine waters involved. [...]

34. In view of the dynamic nature of marine ecosystems and their natural variability, and given that the pressures and impacts on them may vary with the evolution of different patterns of human activity and the impact of climate change, it is essential to recognise that the determination of good environmental status may have to be adapted over time. [...]

36. To ensure the active involvement of the general public in the establishment, implementation and updating of marine strategies, provision should be made for proper public information on the different elements of marine strategies, or their related updates [...]

<http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008L0056&from=EN>

- **Directive 2008/99/EC on the protection of the environment through criminal law**

<http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008L0099&from=EN>

- **2009 EU Protocol on Integrated Coastal Zone Management in the Mediterranean**

HIGHLIGHTS:

'[...] in conformity with the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean and its Protocols, the Parties shall establish a common framework for the integrated management of the Mediterranean coastal zone and shall take the necessary measures to strengthen regional cooperation for this purpose'.

[http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:22009A0204\(01\)&from=EN](http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:22009A0204(01)&from=EN)

- **2013 Summary of the implementation of EU regulation 1967/2006 on the Fishing Protected Areas.**

[http://www.europarl.europa.eu/RegData/etudes/note/join/2013/513990/IPOL-PECH\\_NT\(2013\)513990\\_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/note/join/2013/513990/IPOL-PECH_NT(2013)513990_EN.pdf)

- **Directive 2014/89/EU on establishing a framework for Maritime Spatial Planning**

HIGHLIGHTS

Where maritime spatial plans are likely to have significant effects on the environment, they are subject to Directive 2001/42/EC (Strategic Environmental Assessment – SEA). Where maritime spatial plans include Natura 2000 sites, such an environmental assessment can be combined with the requirements of Article 6 of Directive 92/43/EEC (on the conservation of natural habitats and of wild fauna and flora).

<http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0089&from=EN>

## **International Commitments related to Marine Protected Areas**

- 2002. The 'World Summit on Sustainable Development' commitment to establish a globally representative system of marine and coastal protected areas by 2012.
- 2003. 'Commitment of the Joint Ministerial Meeting of the Helsinki and OSPAR Commissions' (signed in Bremen, Germany) to complete by 2010 a joint network of well-managed marine protected areas in the Atlantic and Baltic seas that, together with the Natura 2000 network, would be ecologically coherent.

- 2003. 'Biodiversity and Landscape Conservation Protocol' - Convention on the Protection of the Black Sea against Pollution - signed in Sofia, Bulgaria.

This protocol aims *inter alia* to maintain the Black Sea ecosystem in a good ecological state and its landscape in the favourable conditions, to protect, to preserve and to manage in a sustainable way the biological and landscape diversity of the Black Sea in order to enrich its biological resources.

- 2004. Decisions on marine and coastal ecosystems and protected areas arising from conferences of the 'Convention on Biological Diversity' (CBD), in particular the COP7 decision to establish (by 2012) and maintain a network of marine and coastal protected areas that are effectively managed, ecologically based, consistent with international law and based on scientific information.

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