How to incorporate Underwater Cultural Heritage into Maritime Spatial Planning: Guidelines and Good Practices

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List of abbreviations

CES	Cultural Ecosystem Services
EEZ	Exclusive Economic Zone
EU	European Union
GIS	Geographic Information System
ICOMOS	International Council on Monuments and Sites
ICZM	Integrated Coastal Zone Management
LSI	Land-Sea interaction
MAP	Mediternannean Action Plan
MCH	Maritime Cultural Heritage
MEA	Millennium Ecosystem Assessment
MS	European Union Member States
MSP	Maritime Spatial Planning or Maritime Spatial Plan(s)
MSSD	Mediterannean Strategy for Sustainable Development
MU	Multi-use in the marine space
NGO	Non-Governmental Organisation
SDG	Sustainable Development Goal
UCH	Underwater Cultural Heritage
UNCLOS	United Nations Convention on the Law of the Sea
UNESCO	United Nations Educational, Scientific and Cultural Organization

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1. INTRODUCTION

The general view of marine space is gradually shifting away from something simply to be protected from exploitation and degradation towards a place of opportunity and investment, both in traditional as well as emerging economic sectors. This shift can not only generate benefits but also entails severe threats to Underwater Cultural Heritage (UCH).

The objective of this handbook is to provide concrete guidance on how Underwater Cultural Heritage may be considered and incorporated in the Maritime Spatial Planning (MSP) process in order to overcome these threats, be established in practical terms, and subsequently developed. Thus, this handbook addresses relevant initiatives in their different stages of development: from those that are just starting up, to those that are already well-established, and looks at ways to achieve an ideal balance and give a new impetus to the nexus between the protection and preservation of UCH and the development of a sustainable blue economy in European seas.

The handbook also acknowledges that the adoption of ***"UCH in MSP"*** solutions by local, regional, national, or transnational actors is highly dependent on their respective regulatory frameworks concerning the protection of UCH, including the ratification of the 2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage, their administrative, geographic, and maritime contexts, and their respective stages in the maritime spatial planning process.

Furthermore, each sea basin has its own history. Some have seen strong cooperation efforts in their common history (e.g., the Baltic Sea) while the common history and culture of others (e.g., the Mediterranean) are rather more fragmented when it comes to the possibility of achieving common plans. Taking this into account, this handbook attempts to present some general principles that are valid to all countries, irrespective of their individual context, and then offers concrete case studies and illustrates the lessons learned from them.

Why, what and for whom?

Understanding, recognising, and utilising Underwater Cultural Heritage (UCH) as a sensitive asset in the marine space and reconciling its preservation and promotion within the sustainable blue economy perspective is a real challenge. The purpose of this handbook is to explore challenges linked to the incorporation of UCH into the Maritime Spatial Planning process and examine the different modes of its incorporation into maritime spatial plans. To this end, it is necessary to outline the legal framework underpinning UCH, that is, the obligations stemming from key international instruments such as the 2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage, as well as the commitments stemming from other processes, such as the Integrated Coastal Zone Management Protocol under the Barcelona Convention, that are relevant to the consideration and integration of Underwater Cultural Heritage into the MSP process. Furthermore, this guide gathers and reviews relevant literature and other materials, and summarises the existing and potential options that can directly inform planners and MSP authorities[1], maritime archaeologists, cultural heritage/archaeology authorities, and practitioners on a topic that is central to the protection and management of the cultural and historic marine environment (e.g., regarding access, education, and recreational activities such as diving, etc.). Our review is underpinned by several case studies at national, sea-basin, and regional levels[2], highlighting that the use of the marine environment should be spatially planned, recognising the protection and management needs of UCH according to its significance and in support of Blue Economy activities such as maritime heritage / underwater cultural tourism. Given the wide-ranging benefits of incorporating UCH into MSP, the audience for this handbook is likely to be broad, including:

- **Public administrative bodies** responsible for establishing maritime spatial plans (MSP authorities) at any level within European Union (EU) Member States. This includes spatial

[1] In accordance with Directive 2014/89/EU, Member States have designated a competent authority or authorities responsible for the implementation of MSP.
[2] Please see Chapter 5 - Boxes 8-10 and Chapter 6- Boxes 14-16..

planners and any supporting agencies which, while performing their duties, are willing to promote ecosystem-based, place-based, adaptive, and resilient maritime spatial planning;

- **Local authorities and stakeholders** in the respective areas who can directly benefit from this guidance to adjust their long-term strategies and zoning plans, when negotiating with potential investors and for citizen outreach and communication;
- **Knowledge providers, professionals, and consultants** who conduct MSP related studies for public authorities and their administrative agencies;
- **Maritime archaeologists and their institutions** running UCH research programmes to raise awareness on the drivers, added values, barriers and impacts of integrating UCH into MSP processes;
- **General public** willing to understand how MSP decisions are made and to engage with an integrated vision of the benefits that a "*planning with culture and nature"* approach may have on the environment, health, culture, and well-being.

PART 1. MSP AND UCH, THE WIDER CONTEXT

CHAPTER 1. What is Maritime Spatial Planning (MSP)?

MSP as a process

A frequently used definition is provided by the Intergovernmental Oceanographic Commission (IOC): "MSP is a step-by-step approach, a public process of analysing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic, and social objectives that are usually specified through a political process" (Ehler and Douvere, 2009). Another basic definition was initially included in the 2014 MSP Directive[3] : "*Maritime Spatial Planning is a process by which the relevant Member State's authorities analyse and organise human activities in marine areas to achieve ecological, economic and social objectives*". In its Roadmap for MSP[4], the European Commission considers MSP as a tool for improved decision-making, providing a framework for arbitrating between competing human activities and managing their impact on the marine environment. Its objective is to balance sectoral interests and achieve sustainable use of marine resources in line with the EU Sustainable Development Strategy (European Commission 2008).

Within these definitions, it is crucial to maintain the attractiveness of MSP even if its emphases are often diverse as conceived and understood by the different stakeholders (developers, ecologists etc.). This will allow stakeholder engagement to continue despite differing views and perceptions. To this end, Firth (2013) recommends viewing MSP as a forum that will obey the usual political processes, without losing its clear focus on the sea, a forum with a wide representation of interested parties and stakeholders, with comprehensive data available, that will ensure freedom for innovation and trust that licensing procedures will be fully respected.

The spatial element of MSP underlines the extensive use of GIS in coastal and marine management, which is important in terms of the technological development of GIS software but perhaps more so in the stimulation it provides to the collation and creation of better quality spatial data. Data gaps and weaknesses in available marine data are now being identified and are prompting data-acquisition that will result in more compatible datasets becoming available. Geographical zoning that distinguishes the surface, the water column and the seabed might be seen as a key spatial solution to otherwise unmanageable conflicts over the use of any particular area of sea.

In contrast with land planning which starts from a position of single-user exclusivity through landownership, **MSP has to address the principle of the sea as 'common',** which means balancing priorities amongst multiple users, who all have a right of access and use over the same area. Another key attribute of the sea – surface, water column, and seabed – is that it is not

[3] DIRECTIVE 2014/89/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 July 2014 establishing a framework for maritime spatial planning.
[4] COM/2008/0791 final

homogenous; different places at sea have different attributes, making them more or less attractive to different users. As the sea is not uniform, some areas are of very little interest to sea-users; but in contrast some areas are extremely important to several different users whose activities may not be compatible with each other or with sustaining future use. However, whichever human activities and interests are present in the sea, it can be considered as one vast interconnected ecosystem.

MSP and ecosystem-based management

The MSP Directive clearly addresses the Ecosystem-based management approach. More specifically, Ecosystem-based management, or the Ecosystem Approach, was developed and codified in the 1992 Convention on Biological Diversity, where it is described as '*a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way*'[5]. Like MSP, much of the Ecosystem Approach is process-oriented, with 12 principles, among which:

- emphasising the protection of ecosystem structure, functioning, and key processes;
- being place-based in focusing on a specific ecosystem and the range of activities affecting it;
- explicitly accounting for the interconnectedness within systems, recognising the importance of interactions between many target species or key services and other non-target species;
- acknowledging interconnectedness among systems, such as between air, land and sea;
- integrating ecological, social, economic, and institutional perspectives, recognising their strong interdependencies.

MSP and ecosystem services

Clearly, Ecosystem-based management is meant to overcome the prevailing nature-culture dichotomy, and this is further reflected in the ecosystem services approach. Ecosystem services have come to the fore through the Millennium Ecosystem Assessment (MEA), which was intended to help provide the knowledge base for improved decision-making. The MEA was published as a series of working group and synthesis reports in 2005 (Millennium Ecosystem Assessment, 2005). Its conceptual framework comprises four types of services, as follows:

- Provisioning Services: Products obtained from ecosystems;
- Regulating Services: Benefits obtained from regulating ecosystem processes;
- Cultural Services: Non-material benefits obtained from ecosystems;
- Supporting Services: Services necessary for the production of all other ecosystem services.

Cultural Ecosystem Services (CES) consists of ten sub-categories including UCH. In the Millennium Assessment, they are defined as the "*non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences*".

Compared to other Ecosystem Services (ES), CES are arguably more directly experienced and appreciated by the public and are therefore seen as key to raising public awareness and support for protecting ecosystems (Daniel et al., 2012). It is, however, also one of the services which is the most difficult to quantify not only in monetary, but also in quantitative terms; both of which are essentially the purpose of ES. Thus, it has been difficult to fully integrate CES within the ES framework and to integrate CES into decision-making and management. Consequently, the issue is about demonstrating underwater cultural heritage's multiple values (historical, social, spiritual, aesthetic, symbolic, etc.), not only from a preservation perspective but as a contributor to the other services as well (Hølleland et al., 2017). This issue of UCH valuation is further discussed in Chapter 3.

[5] Please check also: https://www.cbd.int/ecosystem/description.shtml

MSP and Integrated Coastal Zone Management (ICZM)

The link between MSP and Integrated Coastal Zone Management (ICZM) is most clearly stated in the Mediterranean marine region, thanks to the Barcelona Convention ICZM Protocol. Indeed, spatial planning of coastal zones is an essential component of the ICZM Protocol, as one of the main objectives of ICZM is to "*facilitate, through the rational planning of activities, the sustainable development of coastal zones by ensuring that the environment and landscapes are taken into account in harmony with economic, social and cultural development*" (ICZM Protocol, art. 5[6]).

According to the Mediterranean Action Plan (MAP) Strategy 2016–2021[7], during the 2013 Meeting of the Barcelona Convention held in Istanbul the contracting parties recommended strengthening MAP activity on MSP as part of ICZM with the aim of ensuring Good Environmental Status in the Mediterranean. Moreover, the recommendation to apply MSP is referred to several times in the Mediterranean Strategy for Sustainable Development (MSSD) 2016–2025[8].

On these grounds, and following two years of work coordinated by the MAP Priority Actions Programme Regional Activity Centre (PAP/RAC), the Barcelona Convention's Contracting Parties adopted the "Conceptual Framework for Marine Spatial Planning" in the Mediterranean Sea[9] (UNEP (DEPI)/MED IG.23/23). This is recognised as a guiding document to facilitate the introduction of MSP under the Barcelona Convention and link it to ICZM. It can also provide contracting parties with a common context for implementing MSP in the Mediterranean region (Ramieri et al., 2019).

MSP and Underwater Cultural Heritage (UCH)

To conclude, MSP is about the relationship between people (society) and the sea. This is also the relationship that maritime archaeologists try to understand from a historical perspective. Therefore, **the MSP process can benefit from an understanding of the historic environment including engagement with coastal and maritime archaeologists.** However, the increasing —and usually unplanned—development of human activities and infrastructure at sea is not only threatening marine ecosystems with severe and sometimes irreversible impacts, but also known and unknown UCH. To address this challenge, MSP has recently become a global priority. The radical change of MSP from a sectoral-based approach to a multi-sectoral place-based approach (Ehler and Douvere, 2009; Papageorgiou & Kyvelou, 2017), aimed at co-organizing human activities to avoid conflicts and create synergies, is hugely important. It is also a great opportunity for UCH which, like marine ecosystems themselves, is now experiencing growing pressure and threats due to emerging and developing maritime activities.

MSP, under an integrated place-based approach, creates more opportunities for UCH to receive greater attention in terms of protection and management. At the same time, such an integrated place-based approach is considered ideally suited for tackling the growing competition among sea uses, while mitigating the pressure inflicted by these uses on nature and culture. As with biodiversity conservation, the greatest challenge regarding UCH will be how to reconcile the development of the sustainable blue economy with UCH preservation and promotion. In other words, how UCH should be harmoniously incorporated into the MSP process.

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[6] ICZM Protocol, Article 5 - Objectives of integrated coastal zone management
(a) facilitate, through the rational planning of activities, the sustainable development of coastal zones by ensuring that the environment and landscapes are taken into account in harmony with economic, social and cultural development; (b) preserve coastal zones for the benefit of current and future generations; (c) ensure the sustainable use of natural resources, particularly with regard to water use; (d) ensure preservation of the integrity of coastal ecosystems, landscapes and geomorphology; (e) prevent and/or reduce the effects of natural hazards and in particular of climate change, which can be induced by natural or human activities; (f) achieve coherence between public and private initiatives and
between all decisions by the public authorities, at the national, regional and local levels, which affect the use of the coastal zone.

[7] (UNEP (DEPI)/MED IG.22/28)

[8] https://planbleu.org/sites/default/files/publications/mssd_2016-2025_final.pdf

[9] UNEP (DEPI)/MED IG.23/23, 20th Ordinary Meeting of the Contracting Parties to the Barcelona Convention, December 2017 (Tirana, Albania)

CHAPTER 2. Maritime Cultural Heritage (MCH) and Underwater Cultural heritage (UCH)

The purpose of this chapter is to clarify both the concepts of "Maritime Cultural Heritage" (MCH) and "Underwater Cultural Heritage" (UCH), the latter being the focus of this handbook.

Maritime cultural heritage

Claesson (2011) states that "*MCH is made up of finite and non-renewable cultural resources including coastal or submerged prehistoric and indigenous archaeological sites and landscapes, historic waterfront structures, the remnants of seagoing vessels, and the maritime traditions and lifeways of the past and present*". Hence, the Maritime Cultural Heritage concept includes both material cultural goods (in water and on land) and immaterial ones such as representations, perceptions, discourses, practices, material culture, customs, traditions, imageries and cultural landscapes, that are expressions of maritime culture, the degree of 'maritimity' (Baron, 2008) and the relationship between people, the sea and their surroundings, when possessing a cultural, emotional, or use value, among others.

The recent EU BalticRIM project gives a more instructive definition of MCH as follows "*MCH is both tangible and intangible and is associated with the connections people have with the sea and the resources originating from the different maritime communities in the past. It refers to the traces of people and the elements in the natural environment; the remains of the everyday lives of human beings living in interaction with nature constrained to maritime areas such as the coast, archipelagos and open sea, and the elements, objects and places that are either terrestrial or partly or fully under water. MCH refers to both concrete traces of maritime cultural heritage in the landscape as well as skills and beliefs, habits and practices related to maritime issues passed from generation to generation and extended to different communities in order to present, construct and maintain their identities. MCH is associated with the settlement of coastal areas and archipelagos, seafaring and navigation, fishing and other hunting cultures using the sea, diving, and habits and beliefs related to maritime issues that connect humans to marine features and landscape, among others.*"

It should be noted that by its nature and designation, "Underwater Cultural Heritage" is only related to tangible assets and resources. As explained above, the term "maritime heritage" is used when intangible assets are also considered. It is worth mentioning here that other relevant terms, broader than those provided above, can be used. For example, "*Coastal cultural heritage*", which includes maritime and underwater assets, as well as terrestrial ones, such as historic waterfront buildings, lighthouses, military fortifications and structures, waterfront residential homes, and mill buildings (Claesson, 2011; Papageorgiou 2019). Other terms used in international documents (e.g., the 1954 Hague Convention) and literature mention "*underwater cultural property*" and "*submerged objects*", highlighting the tangible character of UCH and the rights to salvage and rescue their content (Strati, 1991; Graham, 2002; Frigo, 2004).

Among all of the above, this study emphasises the fact that **"Underwater Cultural Heritage"** can be found in the marine space, which is in the geographical area subject to MSP initiatives and processes.

It should be remembered that during the second half of the 20th century, **Underwater Cultural Heritage** received a distinct place in the definition of "cultural heritage" which resulted in widening the scope of assets and resources demanding protection (Ahmad, 2006; Vecco, 2010). Indeed, "maritime archaeology" or "underwater archaeology" began to evolve as a distinct form of archaeology in the early 1960s, triggering an ever-increasing interest in establishing the legal framework for its protection, as well as for salvage and ownership rights, in case of their accidental location (Forrest, 2002).

Box 1. Maritime Cultural Heritage (MCH) Concept

Those cultural tangible goods (in water and on land) and intangible, such as representations, perceptions, discourses, practices, customs, traditions, imageries, cultural landscapes, that are expressions of maritime culture, of the "*maritimity*", of the "*maritime differential fact*" and of the relationship between people, sea and their surroundings; when possessing a cultural, emotional, or use value, among others.

- **Maritime Material Universe**: coastal infrastructure (fortifications), coastal settlements (colonial cities), material culture etc.

- **Maritime Immaterial Universe**: languages, oral expressions, etc.

Source: Baron, 2008

Box 2. UCH, MCH and MSP

- **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.*

Underwater Cultural Heritage (UCH) can be strongly linked by its nature to the planning scope of **Maritime Spatial Planning (MSP).**

But coastal zones with their historical aspects should also be considered. The term **Maritime Cultural Heritage** reflects the link between MSP and integrated coastal zone management (ICZM) as well as regional land planning.

Underwater Cultural Heritage

The UNESCO Convention on the Protection of Underwater Cultural Heritage (2001) defines "Underwater Cultural Heritage" as '*all traces of human existence having a cultural, historical or archaeological character which have been partially or totally underwater, 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'.*

This Convention is particularly innovative in that it addresses the two components of heritage that were to date classically opposed, i.e., **nature** and **culture**, naming a wide range of UCH assets with the two main criteria of 'Time' (giving a 100-year limit) and 'Significance' (distinguishing UCH assets as cultural, historical, or archaeological). The convention excludes all types of pipelines and cables from the definition of UCH, as well as other modern installations placed on the seabed.

Within the large spectrum of existing documents (Boxes 3 and 4 below), the United Nations also directly addressed issues of UCH. In 1982, the United Nations Convention on the Law of the Sea (UNCLOS) made clear reference to UCH in two distinct articles. Art. 149 referred to the need for its protection, whilst Art. 303 addressed issues of jurisdiction and rights over the objects found at sea. It is worth noting that, according to UNCLOS, UCH and submerged archaeological and **historical objects are not considered equivalent to natural resources found on the seabed of a coastal State.** The same goes for archaeological research, which, according to Art. 246 of the Convention, is not included in the scope of "marine scientific research" (Dromgoole, 2010). This means that sovereign rights (and thus protection) of the coastal State regarding UCH do not extend to the Continental Shelf (CS) and the limit of the Exclusive Economic Zone (EEZ) (see Fig. 1). In fact, beyond the Contiguous Zone (CZ), UCH is "abandoned" to the benefit of mankind, unless the State of cultural origin decides to act (Maarleveld, 2012) or claim the objects (Strati, 1991; Francioni, 2003; Papageorgiou, 2019).

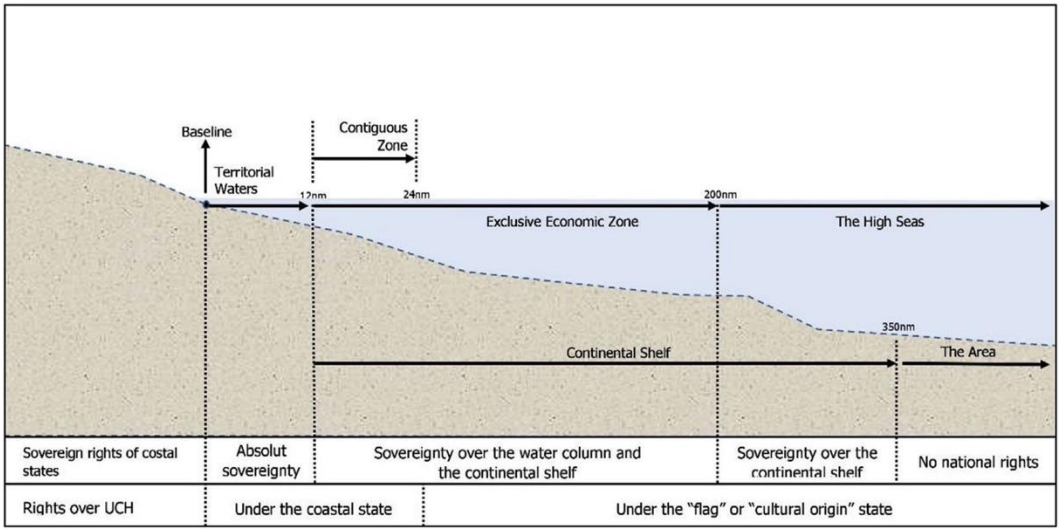

Figure 1. General rights and rights over UCH per UNCLOS zoning, Source: Papageorgiou, 2018

In the Mediterranean, the Barcelona Convention ICZM Protocol pays special attention to coastal cultural heritage. The provisions set out in Article 13 are inspired by the UNESCO Convention on the Protection of Underwater Cultural Heritage, which invites States to cooperate at the regional level, to foster *in situ* conservation and to prohibit the commercial exploitation of underwater cultural heritage.

Despite the UNCLOS, UNESCO Conventions and other regional (e.g., the Barcelona Convention ICZM Protocol) or nationally specific legal instruments, **the tangible and intangible cultural values/heritage associated with the sea continues to be neglected in MSP** due to inherent difficulties in defining and highlighting cultural values, but also in connecting them to specific places to allow a place-based approach to planning (Gee et al, 2017).

However, as highlighted in the European MSP Platform data study (2016), there is a lack of social and cultural elements shaping the maritime space, hence a lack of socio-cultural evidence for MSP. Information about cultural heritage is fascinating to the public and enables engagement with many topics of Ocean Literacy. Information about cultural heritage is also essential to understanding the past, present and future of humanity's relationship with the seas and oceans, at a global and regional level (regional seas).

MSP, can create more opportunities for the protection/preservation of maritime and underwater cultural heritage, as well as its sustainable use, provided it can successfully balance sectoral competition and respective maritime uses. Furthermore, in the context of a sustainable blue economy, the view of the marine environment is gradually shifting towards 'space for investment opportunities' in a variety of sectors. This shift can generate economic returns and development, but also threats to UCH. Cultural heritage is a major contributor to the Blue Economy, especially through recreation and tourism; increasing productivity should enhance -not damage- irreplaceable cultural heritage.

Addressing the opportunities and threats for planning the sustainable management of UCH, such as recreational tourism, in the newly evolving marine environment (also considering the impacts of climate change) requires UCH to be linked with the steps in the MSP processes (governance, engagement and consultation of stakeholders, public participation, etc.)

Box 3 - Key documents on the protection of UCH and submerged objects

1978 Recommendation 848 on Underwater Cultural Heritage (UCH)- Council of Europe (CoE).

1982 United Nations Convention on the Law of the Seas (Art.149 and 303) (UNCLOS)

1985 Draft European Convention (on UCH) - Council of Europe (CoE).

1989 International Convention on Salvage– International Maritime Organisation (IMO).

1992 European Convention for the Protection of Archaeological Heritage, "European Convention on the Protection of the Archaeological Heritage", also known as Valetta or Malta Treaty (1992), Art.2

1996 ICOMOS Charter on the Protection and Management of Underwater Cultural Heritage - International Council on Monuments and Sites (non-binding international treaty).

2001 Convention on the Protection of the Underwater Cultural Heritage– United Nations Educational, Scientific and Cultural Organisation (UNESCO).

2007 Wreck Removal Convention – International Maritime Organisation (IMO). Law of salvage or other rules of admiralty, or laws and practices with respect to cultural exchanges.

2015 UN 2030 Agenda for Sustainable Development, SDG 14 - Conserve and sustainable use of the oceans, seas and marine resources for sustainable development.

Source: authors' own elaboration

Box 4 - Core legislative framework for the protection of military wrecks (incl. WW I and II UCH)

1982 United Nations Convention on the Law of the Sea (UNCLOS)

1992 European Convention on the Protection of the Archaeological Heritage (Valetta or Malta Convention)

1996 Charter on the Protection and Management of Underwater Cultural Heritage (ICOMOS Charter 1996)

2001 UNESCO Convention on the Protection of Underwater Cultural Heritage

It provides a definition for UCH, such as 'State vessels', which are warships, aircraft and other non-commercial vessels that are given cultural importance. It also ensures the rights of flag states to excavate and preserve these vessels beyond their territorial waters. In Article 2, it sets out the rights of State vessels to be consistent with state practice and international law, including the UNCLOS, and claims that nothing in the 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.

Source : Argyropoulos and Stratigea, 2019

To summarise, we could contend that MCH/UCH is a facilitator for sustainable development. Figure 2 below (Henderson, 2019) shows that MCH can combine a variety of sustainable activities and attitudes in the marine space (i.e., heritage tourism, coastal development, infrastructural works, sustainable fishing initiatives, institutional initiatives and governance). As Henderson (2019) states, all these activities can be related and given context by heritage, since these are human practices carried out in the present, although building on the practices of the past.

Box 5 - Cultural Heritage and UCH according to UN Sustainable Development Goal 14 (Life under water) covering several perceptions of the ocean (Clean, Healthy and Resilient, Predicted, Safe Ocean etc.)

- *"Cultural heritage can contribute to a clean ocean by enabling a better understanding of the extent and risks of legacy pollution from shipwrecks, mining waste and land-based sources. A clean ocean is also important for the long-term preservation of UCH" (SDG 14: Clean ocean).*
- *"Cultural heritage is fundamental to understanding how many coastal and marine ecosystems achieved their present form, and to understanding the pressures upon them. Cultural heritage can be an important component of marine ecosystems" (SDG 14: Healthy and resilient ocean).*
- *"Understanding "Ocean Past"—human interaction with the historic environment—is essential to understanding our ocean present and to forecasting change and its implications for human well-being and livelihoods" (SDG 14: Predicted ocean).*
- *Cultural heritage informs the understanding of coastal inhabitation and intervention in the past and present—including the impact of previous catastrophes—to identify risks, present examples of human adaptations, and to encourage resilience (SDG 14: safe ocean).*

Source : UN 2030 Agenda for Sustainable development

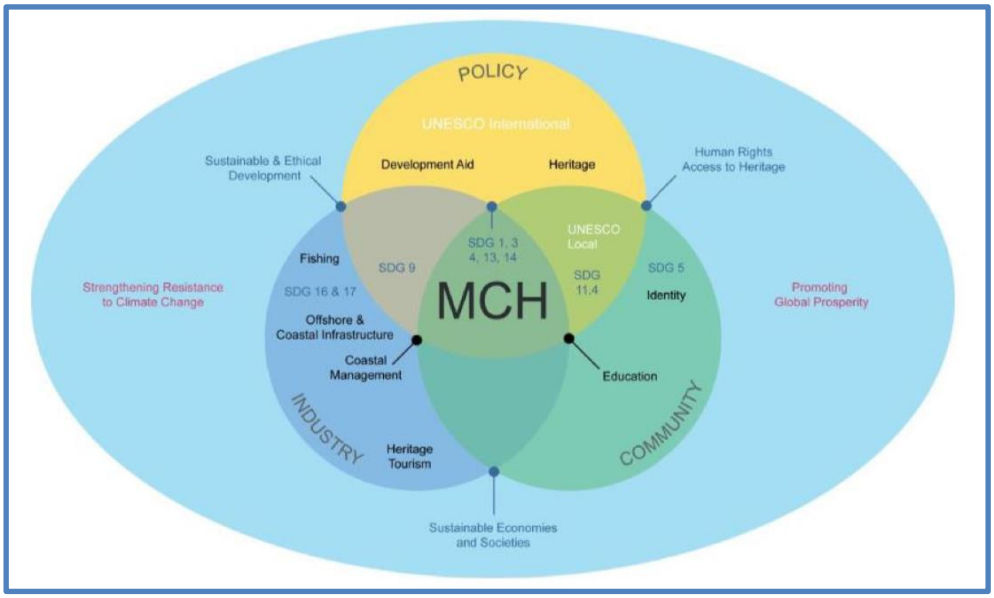

Figure 2. MCH at the intersection of policy, industry and community, Source: Henderson, 2019

CHAPTER 3. Economic valuation of underwater cultural heritage. Why is this useful for MSP?

The economic value of UCH

Underwater cultural heritage consists of traces of human activity from past epochs. Therefore, it represents a special kind of reserve, embodying vital social, economic, cultural, and environmental values. A relevant literature review (Strati, 1999; Claesson 2011; Smith and Couper, 2003; Papageorgiou, 2018) concludes that detecting and assessing values deriving from UCH is a complicated task and is mainly approached through ecological economics and other economic valuation techniques, despite the shortcomings linked with the intangible (non-extractive) character of several components of UCH. When human and environmental actions impact cultural heritage, management decisions should be made that consider not only global or national historical significance, but also sociocultural, as well as economic, values relevant to regional and local populations and communities. Consciousness of and sensitivity to the principles of equity, precaution, and cultural diversity provide the starting point for the long-term sustainability of cultural heritage resources.

By acknowledging the existence of **"cultural capital"** (Claesson, 2011) (and **maritime cultural capital** accordingly) and the interconnection of natural and human/cultural systems, government, resource managers and planners, and the public can:

- conceptualise **cultural heritage as a product of human interaction with the natural environment;**
- analyse the goods and services provided by cultural heritage assets;
- encourage science and educational activities (incl. museums with artefacts taken from UCH sites) contributing to the well-being of coastal communities;
- support economic activities such as leisure, tourism (scuba diving, wreck-diving, etc.), and other blue growth activities.

There are also external conditions affecting the value of UCH, mainly environmental and socio-political (Khakzad et al., 2015). The environmental parameters affecting UCH, are presented in Box 6.

Box 6. Environmental parameters affecting the economic value of UCH

✓ natural processes (sea level rise, coastal erosion, etc.)
✓ climate change (affecting water temperature and chemical composition of water)
✓ natural and technological disasters (earthquakes, tsunamis, oil spills, etc.)

Source: Papageorgiou, 2019

The valuation of UCH

Ecological economics can be used to assess the market and non-market, or use and non-use, values associated with UCH. Valuation tools and techniques can contribute to addressing exactly which site or object is worthy of protection, to whom it is important, and how resource managers and planners can best exploit and interpret that heritage to the benefit of the people. Valuations determine the historical significance and intrinsic values of maritime historical and archaeological resources, and assess opportunities for use, enjoyment, education, and community engagement.

The non-extractive (non-market) uses and values may be linked with social, historical, artistic, spiritual, and symbolic qualities, i.e., qualities that are not easily recognised by markets (Claesson, 2011). On the other hand, the extractive (market) uses of UCH are mainly associated with recreation, tourism, and cultural activities such as displaying artefacts from UCH sites in museums. However, this 'solution', concerning the removal of submerged objects and their inclusion in museum collections requires special attention due to the limitations set by international law, especially those concerning salvage rights (Whitehead and Finney, 2003; Davidde, 2004).

Acknowledging and evaluating the value of UCH is essential for stakeholders and decision-makers in order to identify the costs and benefits of UCH preservation compared to other maritime resource and activities (Claesson, 2011; Champ et al., 2003; Papageorgiou, 2019). This is especially important now in the era of the development of a sustainable blue economy, where the value of market activities can easily be estimated, in contrast with UCH which has limited direct or extractive uses. Summing up, the valuation of UCH is key, in order to set management strategies, identify long-term economic and social benefits, and ensure conservation for present and future generations (Champ et al., 2003). Classification and economic valuation associated with UCH – although quite a complicated task– becomes crucial when **planning the marine space**, in order to identify sites and objects that must be prioritised in MSP implementation and that should facilitate decision-making.

However, we should not forget that sustainable development is the fundamental principle upon which underwater cultural heritage should be based (Claesson, 2011). This leading principle postulates that cultural resources should be managed in a manner that guarantees conservation for present generations without compromising the possibility of future generations to access a series of sociocultural benefits from these resources.

PART 2. UCH IN MARITIME SPATIAL PLANNING: SOLUTIONS AND RECOMMENDATIONS

CHAPTER 4. How is UCH considered in national MS plans?

This chapter provides some brief examples of how UCH is considered in national MS plans. It is evident that there is no organised information on this - with the exception of information provided by the BalticRIM Project for the countries involved[10]- and thus an inventory of this information for *all* EU Member States will be valuable for monitoring the progress made and stimulating transnational dialogue.

Germany: Two Maritime Spatial Plans for the EEZs, three Maritime Spatial Plans for the coastal federal states

Figure 3. Maritime Spatial Planning areas of Germany, Source: European MSP Platform

In Germany, UCH is taken into consideration during spatial planning, but as of yet there are no designated areas in the MSPs corresponding to the EEZs in the North and Baltic seas. UCH is only considered in Strategic Environmental Assessments (SEA) when assessing the impact of other uses on UCH. However, a general remark is that Federal States are more proactive in incorporating UCH in MSP.

Lithuania: One Maritime Spatial Plan, UCH as a distinct sector

Figure 4. Lithuania's Maritime Spatial Planning area, Source: European MSP Platform

In Lithuania, the revised Law on Territorial Planning (2013) includes stipulations on sea space planning and UCH is characterised as "current use" in spatial planning. Designation of the coastal zone as a vulnerable area within MSP, regarding UCH as a distinct sector, is under discussion.

[10] Please see BalticRIM (2020). Integrating cultural heritage into maritime spatial planning in the BSR – Final publication of the Baltic Sea Region Integrated Maritime Cultural Heritage Management Project (BalticRIM 2017-2020). Retrieved January 20, 2021, from https://www.submariner-network.eu/images/BalticRIM_final_publication_Dec2020-1_compressed.pdf

Finland: Three MSPs plus Aland; one existing regional plan for Kymenlaakso

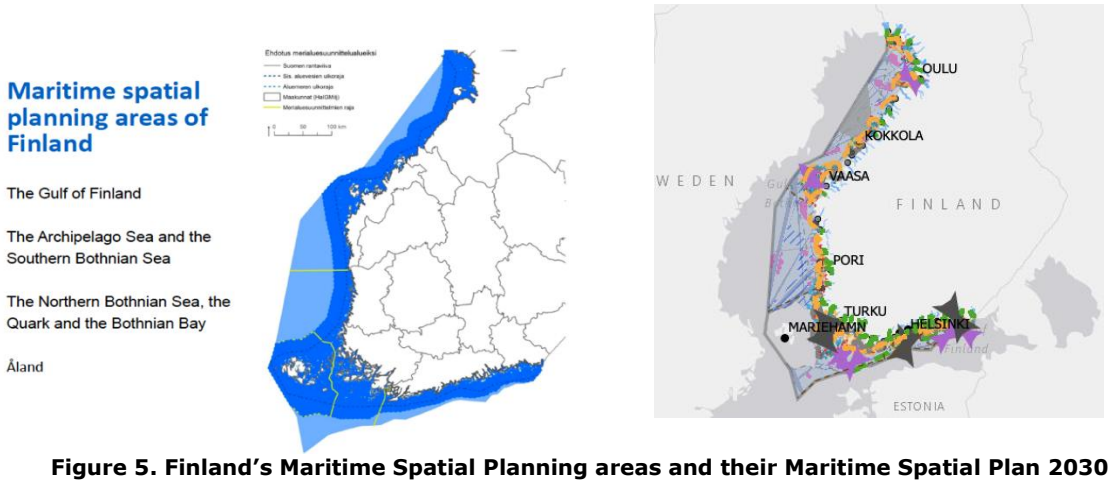

Figure 5. Finland's Maritime Spatial Planning areas and their Maritime Spatial Plan 2030

MSP in Finland is strategic regarding Blue Growth scenarios and their diverse impacts on the marine environment. The maritime spatial plan, covering Finland's territorial waters and Exclusive Economic Zone (EEZ) and prepared in accordance with the Land Use and Building Act, was approved in December 2020. The councils of the coastal regions prepared the plan in three parts:

1. Gulf of Finland: Regional Council of Kymenlaakso and Helsinki-Uusimaa Regional Council; 2. Archipelago Sea and Southern Bothnian Sea: Regional Council of Southwest Finland and Regional Council of Satakunta; 3. Northern Bothnian Sea, Quark and Bay of Bothnia: Regional Council of Ostrobothnia, Regional Council of Central Ostrobothnia, Council of Oulu Region and Regional Council of Lapland.

The Åland Islands, an autonomous region of Finland, has established its own Maritime Spatial Plan.

The regional governments of the councils of the coastal regions took it upon themselves to request statements from the authorities and entities to whose sectors or duties the plan is materially relevant. Special attention is being paid to the particular characteristics of the sea areas and to land-sea interactions (LSI).

"Cultural value" areas and "significant underwater natural values" are designated in the MSP plan and the issue of underwater landscape following the provisions of the European Landscape Convention is emphasised by the Finnish Heritage Agency (FHA). The latter continuously promotes the idea of "*underwater landscape*" and works in co-operation with different international, Baltic Sea level, national, and regional authorities, organisations, diving associations, and NGOs. The Agency also focuses on divers, considering them as valuable stakeholders (Tikkanen & Seesmeri, 2019). Although Finland has not yet ratified the Convention on the Protection of the Underwater Cultural Heritage, the country's operations are already strongly guided by the Convention[11].

France: strategic planning at regional level

In France, the MSP Directive has been formalised through an Integrated Coastal and Ocean Management approach as stated in the "Grenelle 2" Act (12 July 2010) and included in the Environmental Code (Art. L219-1 to L219-18). The MSP approach is part of the Maritime Strategy Document (Document Stratégique de Façade, DSF) as well as its environmental pillar, the Marine Action Plan (Plans d'action pour le milieu marin, PAMM). It is also consistent with the EU Marine Strategy Framework Directive in accordance with the Water Basin Management Plan (Schéma Directeur d'Aménagement et de Gestion des Eaux, SDAGE) and the EU Water Framework Directive. The aforementioned Maritime Strategy Document (DSF) provides guidelines for the development of

[11] Please see also : https://meriskenaariot.info/meialuesuunnitelma/en/cultural-heritage/

maritime activities, ecosystem protection, monitoring and surveillance, management and space attribution to the various uses, as well as the implementation measures.

Figure 6. The four maritime sub-regions of metropolitan France

In all sub-regions, the coastal and maritime heritage (MCH) inventory remains fragmented. More specifically, regarding the so-called 'underwater archaeological heritage', there is only one atlas covering the Southern Region (Provence-Alpes-Côte d'Azur), prepared by the Department of Coastal and Underwater Archaeological Research of the Ministry of Culture (Département de recherches archéologiques subaquatiques et sous-marines, DRASSM) and the NGO Arkaeos. In the Maritime Strategic Documents, UCH is listed as a 'cross-cutting' socio-economic objective.

Poland: Incorporation of UCH in ongoing MSP is quite advanced.

Figure 7. Poland's Maritime Spatial Planning area, Source: European MSP Platform

MSP in Poland is still ongoing, and new, more detailed plans are under formulation e.g., the Gdansk Bay and Vistula Lagoon plan. During these MSP processes there is evidence of awareness-raising concerning the UCH as a distinct sector. MSP regulates UCH in the form of general rules for its protection, in contrast with MCH that has only been taken into account as simple evidence. UCH mapping and analysis has taken place relatively recently (2014 - 2015) and the outcomes of the analysis were reported and discussed with stakeholders whilst UCH related information gaps were recognised. Details on how UCH is being considered in the zoning plan (1:200 000), covering the majority of the Polish sea areas, can be found in the 2020 BalticRIM report[12].

Furthermore, the BalticRIM project, and some other UCH related processes, have greatly contributed to incorporating UCH into MSP in Poland. This can be verified in the MSP processes currently under development (Gulf of Gdansk and Vistula Lagoon). The aforementioned BalticRIM report makes explicit reference to the promotion of the concept of Multi-use with regard to the triplet "UCH-Tourism - Nature Conservation".

[12] Please see https://www.submariner-network.eu/images/BalticRIM_final_publication_Dec2020-1_compressed.pdf

Greece: High potential to incorporate UCH in MSP, under a place-based approach.

Figure 8. Greece's Maritime Spatial Planning area, Source: European MSP Platform

Greece, which has more than 10,000 archaeological sites and ancient monuments as well as several thousand monuments from modern times, located both in the terrestrial and the marine spaces, is considered a pioneer with regard to the protection of cultural heritage. The country has a strong and longstanding legal framework for antiquities' conservation, dating back to 1834 and incorporating provisions for both terrestrial and underwater cultural heritage (UCH). At the turn of the 20th century, important legislative decisions concerning the protection and preservation of CH and UCH were taken, such as:

1. The issue of law 3028/2002 "*For the Protection of Antiquities and Cultural Heritage in general*" integrating all past legislative actions into one law; and addressing the protection of CH (including UCH). Particularly for UCH, the Law refers to ancient archaeological sites located on the seabed or at the bottom of lakes or rivers. It also states that "*cultural objects within the boundaries of the Greek territory, including territorial waters, as well as in other maritime areas, where Greece has jurisdiction under the international law of the sea, are subject to legislative protection*". Furthermore, following this law, areas where historical naval battles took place may be declared as protected historical marine sites, whilst contemporary, newer shipwrecks may also be considered as monuments.

2. In 2003 shipwrecks were recognised as cultural goods and monuments, provided they have been lying in Greek seas for more than 50 years. This enhances the protection of shipwrecks as UCH, in contrast to the UNESCO Convention, which declares shipwrecks as monuments only when lying underwater for more than 100 years.

3. In 2005, the establishment of diving parks for recreational diving, dive training, scientific research, etc. was allowed by law[13]. Hence, diving areas can now be found all over the Greek coastline, in contrast to the previous regime that allocated to diving only 620 miles out of the 10,000 of the coastline.

4. In 2013, access to Maritime Archaeological Sites was permitted[14] thus enabling cultural development contracts, specifying cultural projects, programmes, and related services within Maritime Archaeological Sites.

[13] See Greek law L.3409/2005
[14] See Greek law 4179/2013

Taking into consideration the cultural wealth of the Greek state as well as its position in the global tourism market, culture and tourism policies are of strategic importance (Koutsi and Stratigea, 2019) and are implemented on a national level through the Ministries of Culture and Tourism. Both industries also depend on the authority of co-responsible Ministries such as the Ministry of Shipping and Insular Policy, the Ministry of Environment and Energy, and the Ministry of Agricultural Development and Food which deals with sectoral policies impacting both land and sea e.g., coastal fisheries.

Since no Maritime Spatial Plan exists yet in Greece, one initiative that is consistent with the Blue Growth Agenda and the MSP perspective is the transition from a sectorally oriented MSP to a MSP operating under a place-based approach. This new approach became official through law 4546/2018, issued in compliance to the European MSP Directive. This latest trend in Greece towards a place-based MSP approach is of great importance to MCH/UCH, which is found in abundance on coastal and sea space. This is firstly because MSP may essentially tackle key challenges related to the emerging blue economy sectors (e.g., aquaculture/industrial aquaculture, extraction of fossil fuels etc.). MSP may ensure better allocation and regulation of maritime activities that may directly or indirectly affect UCH. It can provide solutions to incorporate UCH in future Maritime Spatial Plans, taking into account, through relevant trade-offs, the apparently high economic value of UCH and its constructive co-existence with maritime tourism. The Multi-use (MU) concept is not yet included in MSP laws or in strategic policy documents - mainly due to the dominance of terrestrial spatial plans that favour the exclusive rights of highly competitive and expansive maritime activities (e.g., aquaculture). However, the MU based on the triplet "UCH-Tourism-Nature Conservation", presents a rather high potential for implementation (Kyvelou and Ierapetritis, 2021).

Box.7 Incorporation of UCH in MSP, Insights from the BALTICRIM Project's case-studies, Source: BALTICRIM Project[15]

7 UCH Sites, Description	Actions planned by the project	Outcomes achieved by the project
Denmark & Schleswig-Holstein – Flensburg Fjord: The area includes prehistoric settlement sites and shipwrecks.	The Project would make the data comparable from both the Danish and the German sides. With full incorporation of UCH in MSP being considered unrealistic, the concept of the ship-cemetery for decommissioned historical vessels was examined.	Stakeholders were brought together, and several options (for UCH, tourism/diving, municipal development, nature conservation) have been considered. A dialogue between the archaeologists responsible for the UCH from both sides of the Fjord was launched.
Germany – Schleswig-Holstein's maritime cultural heritage. Nearly 300 underwater archaeological sites, including: Inundated Mesolithic sites in Neustadt Bay and Flensburg Fjord, as well as inundated medieval settlements in Norderhever; Sea Battle area near Kiel (dated 1715); World Heritage Sites: Hedeby's Viking Age harbour area & early medieval sea-barrier of the Danevirke; Puttgarden Reef ship-trap.	The Project expected to provide MSP authorities with data on areas with high UCH potential to be considered in the MSP. It was also expected to update the ALSH-database on UCH and contribute to the Blue Growth initiative. 50 new sites were expected to be listed as "protected", while non-listed sites would be kept in the BalticRIM database (as sites with non-verified potential).	The MSP authorities of Schleswig-Holstein (territorial waters) and the German Federal Agency (EEZ) expressed their willingness to take into account the Project recommendations, but stated that archaeological "priority areas" (as defined) cannot be included in the plan itself, due to the insufficient statutory basis concerning the designation of the areas in MSP. Instead, a description of MCH protection goals and density maps will be included as supplementary documents to the MSP plan.
Poland – Wrecks & submerged landscape in the Gdańsk area. Historical port area (onshore and offshore) with wrecks and hydraulic remains, and submerged landscape in the Puck Bay.	Upon completion of the surveys and radiocarbon dating, the Project planned to add new sites to the EPSA (NMM UCH database) and other official databases. The palaeo-landscape area and UCH sites would be incorporated into the national MSP.	The sites are being investigated and documented, in order to establish the UCH zone. Nearly all missing data was completed and planned activities fulfilled.
Lithuania - Relict forest area/wrecks. Over 100 objects of well-preserved underwater remains of the relic trees (and peat) located at the depths 24.5 – 29 m.	The Project expected to have an area entirely documented with recommendations for use and on-site protection regulations, as well as to integrate the proposed UCH site into the national MSP process, and to have the first UCH site mapped by 2021.	The area was delineated, and the assets were documented. It was then introduced into the National MSP as a proposed area for establishment. Suggestions for a regulatory framework were communicated to the Ministry of Culture.
Finland. 1. Jussarö ship-trap; 2. Lahia ship-trap and the maritime cultural landscape in the Bothnian Sea; 3. Natural harbours in the Archipelago Sea and the southern Bothnian Sea; 4. Ruotsinsalmi Sea Battle Area.	The Project expected to collect as much archaeological information as possible. The data would be disseminated and applied to UCH categorisation and analysis.	The research fieldwork trips were conducted in collaboration with the FHA and Metsähallitus Parks & Wildlife. The UCH sites were surveyed, and data was collected. The results were integrated in the reports, the FHA's register and the online map service kyppi.fi. **The dot-based data was interpreted and analysed into areal data (moving from geolocation to data description) and incorporated into the planning documents and MSP** (i.e. "A review of the Finnish maritime cultural Heritage" 04/2019).
UCH sites in cross-border areas		
Cross-border area between Estonia and Finland (Gulf of Finland). Among the sites are shipwrecks, including the Helsinki underwater park Kronprins Gustav Adolf; the historic	The Project expected to significantly raise awareness of both Estonian and Finnish stakeholders (i.e., MSP planners, local municipalities, corporations such as Tallinn harbour and Tallink).	The Project managed to collect information on collective UCH and its socio-economic and value/touristic potential, in the Gulf of Finland, from both the Finnish and Estonian sides.

[15] https://www.submariner-network.eu/images/BalticRIM_final_publication_Dec2020-1_compressed.pdf

harbours of Tallinn Bay & historical sea routes between Tallinn and Helsinki; the Toompea fortress in Tallinn & Suomenlinna World Heritage Sea Fortress in Helsinki.		
Cross-border area, between Russia and Finland (Gulf of Finland). UCH sites include stone quarries and wrecks in the Virolahti Bay (Finland) and in the Bay of Vyborg (Russia), along the route of stone, leading to Cronstadt and St. Petersburg (Russia).	The Project expected to significantly raise awareness of both Finnish and Russian stakeholders (i.e., MSP planners and local communities working with information on MCH in the Virolahti Bay and the Bay of Viborg).	The Project collected UCH information from both Finnish and Russian sides.

CHAPTER 5. UCH and the Multi-use concept: tourism-driven Multi-use combined with UCH and environmental protection.

Assessing the potential of the Multi-use "Underwater Cultural Heritage-Tourism-Nature Conservation"

The increasing demand for marine space and the need for "spatial efficiency" in the sea inevitably leads to the consideration of multi-use (MU), at least between uses that present reasonable compatibility. Thus, multi-use in the marine space has been explored through several projects (Kyvelou & Ierapetritis, 2019, p.6), including those that investigate the opportunities of MU in European Seas with a view to innovation and sustainable Blue Economy, within the framework of MSP. **Soft MU combinations** refer to "*co-location*" or "*co-existence*" of uses when **existing infrastructure is used without major adjustments**, while **hard MU combinations** refer to infrastructural integration of permanent structures (e.g., MU platforms).

In this guide, the potential of the MU **"Underwater Cultural Heritage-Tourism-Nature Conservation"** will be explored. This MU can be defined as a combination of the protection of UCH with tourist or recreational activities involving contiguous marine ecosystems. This can either take the form of *land-based museums* ('*dry footed access*'), where the local UCH can be preserved and displayed or using *glass bottom boats* to access and 'present' UCH locations. It can also permit *in situ access* to scuba divers to visit UCH sites. Additionally, where relevant, this MU involves a sensible endeavour to couple environmental/nature conservation and UCH protection measures. Examples of both forms of this MU exist in the Baltic and Eastern Atlantic seas. The Black Sea's HERAS project (cf. Box 9) is also promoting such MUs. Other examples include the Ruotsinsalmi Naval battle area (Kymenlaakso), the story of Vrouw Maria (3D virtual available) and the "Kronprins Gustav Adolf underwater park" (1st maritime historical underwater park).

Box 8. Underwater Museum in the middle of the Baltic Sea

The project **aims to unlock the tourism potential of the Baltic Sea's underwater cultural heritage** by creating better solutions for visiting unique underwater objects at their original location. It provides a tourist attraction in the Central Baltic area, consisting of shipwrecks in Estonia, Sweden, and Finland. The wrecks are equipped with anchor buoys and information boards "in situ" and more detail about the wrecks' history, accompanied by 3D models, is available on the web. The main actors involved joined forces to **advertise and promote underwater heritage tourism,** to raise awareness of the unique underwater cultural heritage of the Baltic Sea, how it should be preserved and its potential towards developing tourism in the region.

Source: BALTACAR Project

Box 9. The HERAS Project

"Submarine Archaeological Heritage of the Western Black Sea Shelf"

The HERAS Project **aims to develop the tourist potential of the Western Black Sea Shelf** by identifying and promoting Bulgaria and Romania's underwater multi-millenary cultural heritage resources. It takes into account the existence of important underwater cultural heritage sites and the existing knowledge, although very limited, of the common UCH, the absence of joint strategies for the sustainable development of the **Constanta** and **Dobrich** coastal areas despite common multi-millenary history and the existence of other unique attractions along the coast (historical/archaeological sites, natural protected areas, caves, mass tourism and recreational facilities).

For more info: https://www.msp-platform.eu/projects/submarine-archaeological-heritage-western-black-sea-shelf

Box. 10 Vrouw Maria: A Holistic User-Centred Approach to Immersive Digital Cultural Heritage Installations

Vrouw Maria is a Dutch merchant ship that sank near the Finnish coast in 1771. Knowledge of the wreck is listed in archives from the early 1970s and several attempts were made to find it. Vrouw Maria was finally found in 1999 at a depth of 40 meters, by Pro Vrouw Maria Association and Rauno Koivusaari. Vrouw Maria is a well-preserved example of an 18th century Snow rigged Dutch merchant ship which sailed between Western Europe and Russia. Although this story primarily concerns Finland, Russia, and the Netherlands,Vrouw Maria **has a huge international cultural significance** and is considered a **good example of the common European maritime heritage,** or even the **global maritime heritage** because of the colonial goods in the hold such as sugar, tobacco and coffee probably originating in India, China, Africa, and North and South America (Tikkanen, 2011).

The installation was built for the Maritime Museum in Kotka (Finland), and is part of the preservation efforts of the wreck, which still remains underwater. In addition to the cultural heritage aspect, the project was an experiment in holistic user-centred design, where several design methods, such as scenarios, role playing, and storyboards and prototyping were employed in order to create the final product as well as assess their utility in the scope of immersive installations. Vrouw Maria represented Finland in the MoSS EU funded project 2001-2004 (Monitoring, Safeguarding and Visualizing North-European Shipwreck Sites). The Project was set up with the aim of monitoring, safeguarding and visualising shipwrecks in-situ. The Vrouw Maria Underwater Project offered solutions to everyday maritime archaeological questions such as in-situ protection, maintenance, documentation, visualisation, and underwater exhibition.

Vrouw Maria is located in a Natura 2000 Area of the Archipelago National Park. This means that all activities at the wreck's site must be granted permission by the Finnish nature agencies. In addition, the wreck lies within the so-called "strict preservation" part of the Park where even entering the area is extremely restricted and diving with apparatus is prohibited. As such, it is not possible to open an underwater on-site park. These different layers of prohibitions mean that the general public can't just go and visit the site above or below the water surface. Under these circumstances, Vrouw Maria was made accessible in a different way.

Through a simulation constructed by Aalto University and the Finnish Heritage Agency, the general public could examine in detail the treasure ship which is difficult to access in reality. At the time, the Vrouw Maria simulation was a totally novel way of visualising the underwater world and making it accessible. The Vrouw Maria interactive, real-time, gesture-based 3D virtual reality simulation gives the visitor a feeling of "being there" at the actual site and the possibility to navigate and experience the wreck, the underwater landscape, and also the soundscape composed by sounds collected from different sources and contributing to storytelling, to a submerging atmosphere of immersion and the audible feedback from the user's actions. Non- interactive parts of the simulation (animated scenes) explain the historical events and time passing between the years 1771 – 2011 in the form of visual and audible events. There are also Info points for more detailed information. Presenting the underwater scene of the Vrouw Maria experientially adds an appealing aspect to the initial story of the wreck. The Museum exhibition also contains recorded interviews, providing an insight into the ideas and feelings of those few divers who have visited the site, promoting the idea that heritage is the combination of both the site and the people using it. In addition, the feeling of visiting the site is animated through a video clip of the above water landscape. A touchable 3D-print of the underwater landscape for the blind is also included.

Since presentation techniques for UCH are being developed rapidly, the Finnish Heritage Agency is now striving to present the Vrouw Maria as a photogrammetric model.

Sources : Alvik (2019), Tikkanen (2011)

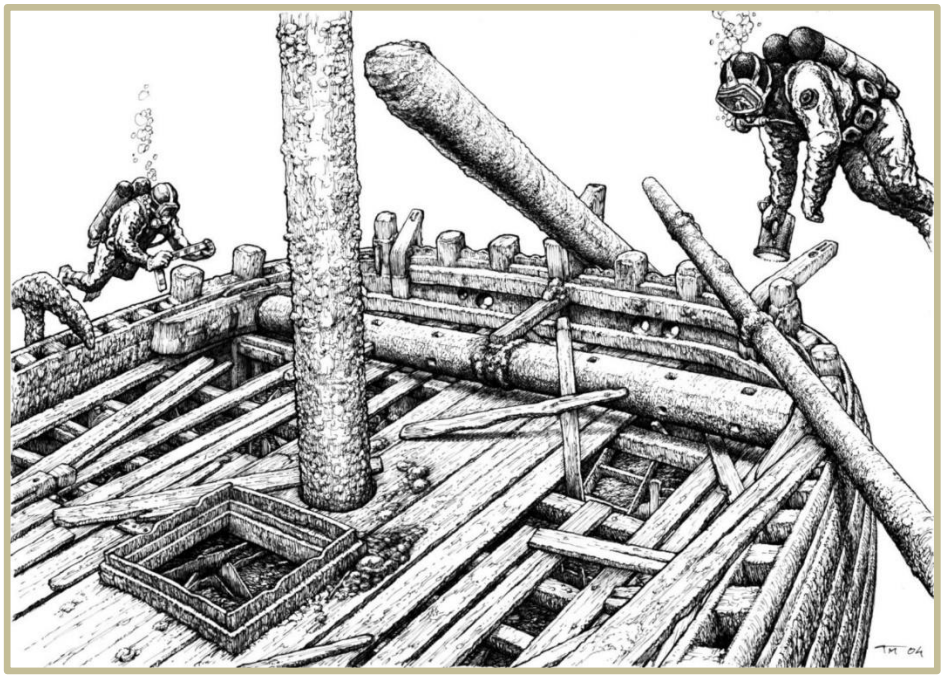

Figure 9. Investigations of the Vrouw Maria, illustrated by artwork. Drawing by Tiina Miettinen, Finnish Heritage Agency.

The MU "UCH-Tourism-Nature Conservation" in the Mediterranean

There are already many examples in the Mediterranean of the MU "UCH-Tourism-Nature Conservation" cited by Depellegrin et al., 2019.

Italy: The Paguro Oil & Gas platform is an existing example of the MU "UCH-Tourism-Nature Conservation" which was submerged after a fire in 1965 off the coast of the Emilia-Romagna region. Today this exists as an artificial reef and is included in the NATURA 2000 Network (SIC-IT4070026; Regione Emilia Romagna, 2013). Other examples in Italy of UCH combined with tourism activities can be found at the pre-Roman city of Nora (Southern Sardinia) and the sarcophagi of the San Pietro wreck (Taranto; Dive in history, 2018). "Dive in History" is a consortium of public institutions and private companies from Greece and Italy. Through the EU project "Underwater Cultural Route in Classical Antiquity", they have created an innovative touristic cultural product, named "*Dive In History*", involving both countries to link together their common underwater archaeological heritage and their shared cultural values.

Greece: Greece, following a series of regulations[16] for the establishment of marine/ underwater archaeological museums open for visitors, has already undertaken relevant initiatives in different places: at Laurio and Makronissos, in the Sporades Islands (coinciding with the National Marine Park of Alonissos and Sporades) and at Pylos and Methoni. The first underwater museum in Greece opened at the site of Peristera where their first ancient shipwreck was made accessible to the public, including divers. The area is still untouched by mass tourism, creating conditions for alternative tourism projects that can contribute to Blue Growth and sustainable development, minimising threats to biodiversity and ecosystems. The shipwreck site is located within the territory of the National Marine Park of Alonissos which is the largest marine protected area (MPAs) in Europe and extremely rich in flora and fauna.

[16] Regulation concerning the "Establishment of Underwater Archaeological Sites of Lavreotiki – Makronissos open for visitors", the "Establishment of Underwater Archaeological Sites of Pagasitikos North Sporades open for visitors" and the "Establishment of Underwater Archaeological Sites of Pylos and Methoni open for visitors".

Malta: The systematic underwater archaeological surveys that have been organised around Malta and Gozo have revealed a plethora of underwater archaeological sites. These range from a 2,700-year-old Phoenician Shipwreck, Roman and Early Modern Shipwrecks, dozens of aircraft crash sites, to submarines and battleships from both World Wars. The need for controlled monitoring of these sites and the appropriate heritage legislation was identified in the early 1960s. However, underwater cultural heritage was not clearly protected and managed until recently, with Act No. XIX of 2019, which amended the 2002 Cultural Heritage Act and included any cultural remains over 50 years old on the seabed as part of Malta's underwater cultural heritage.

Cyprus and France: In Cyprus and in France, along the French Riviera, several underwater cultural heritage sites exist, e.g., Zinovia relict (Lacanaria Bay) or Nemesis III (Famagusta; Cyprus Island, 2018) and along the Côte D'Azur (Info-Provence, 2018)

There is a lot of potential for MU "UCH-Tourism-Nature Conservation" development in the Mediterranean Sea in view of its rich UCH sites, warm temperatures, and clear waters with often low salinity. There are reportedly about 3,500,000 scuba divers in Europe, and 70% of them choose the Mediterranean region. Divers expect a variety of underwater landscapes (e.g., shipwreck), thus several Mediterranean countries have already taken advantage of their natural and cultural wealth by setting up underwater archaeological parks (ECORYS, 2013).

The **Drivers and Added Values** related to this MU are the conscious management of tourism activities involving UCH which can lead to win-win situations for both UCH conservation and tourism as it raises public awareness and appreciation of the value of UCH sites, whilst potentially providing an income stream for better management of UCH sites (MUSES Project Action Plan, 2018). The main **Challenges and Barriers** to UCH-related MUs are the strict protection measures and resistance from UCH authorities regarding tourist access to their sites due to the risk of damage and theft of UCH artefacts. Moreover, scuba diving attracts a limited number of tourists and 'dry access' solutions are costly. This coupled with the often-limited funding and failure of UCH authorities or museums to engage in MU initiatives, has limited its development (MUSES Project Action Plan, 2018). In many countries the MU concept is not yet included in MSP laws, nor in strategic policy documents. This is primarily due to the dominance of terrestrial spatial plans that favour the exclusive rights of expansive and highly competitive maritime activities (e.g., the AZA zones of aquaculture).

Box 11. Assessment of the MU "UCH-Tourism-Nature Conservation" potential in the Eastern Mediterranean, DABI analysis

DRIVERS	BARRIERS
• UCH sites are abundant, many of them are still to be discovered and designed. • MU does not exist yet in designated UCH areas. • Diving activities to wrecks are already happening – this fact encourages this MU. • Tourism product diversification is highly promoted (ecotourism, cultural heritage tourism) • Water visibility and favourable weather conditions • Meeting targets for nature conservation (10% MPAs) at the same time would be of further added value. • There are about 3,500,000 scuba divers reported in Europe; 70% of them choose the Mediterranean region.	• Legal provisions (tourism is prohibited by law in underwater archaeological sites, archaeological areas are not designated) • Policy gaps (there are no policy provisions explicitly referring to MU concept and development). Exclusive rights of expansive and competitive marine and coastal activities (e.g., aquaculture) often hamper the implementation of MUs. • Economic barriers (e.g., lack of economic incentives to create UCH centres or museums) • Social constraints (lack of collective mentality and action required for this MU initiative, need for certified skills for tourists/diving, restrictions due to weather conditions).
ADDED VALUES	**IMPACTS**
• Tourist access to UCH sites serves as a source of revenue for the management of UCH. • Public access increases appreciation of the value of UCH and recognition of its significance. • Shapes cultural identity and fosters interaction between the community and their history. • Better management of UCH sites provide shelter for fish from human activities that can impact sensitive seabed habitats. • Provision of new jobs due to new marine museums and information stands on land. • Increase of local revenues related to tourist services. • Improved regulation and funding in place for UCH. • Possible mutual opportunities and advantages amongst UCH authorities, diving centre and tour operators, touristic service providers, fishery institutions and associations for marine protection.	• Site specific and the physical and natural conditions can limit the popularity of this MU. • Involves numerous heterogeneous stakeholders. • Risk of looting/potential damage. • Reluctance of authorities to provide access to UCH sites. • Lack of specialised skills (e.g., diving certification), or the design of new equipment

Source: Kyriazi, Z., Mourmouris A.,Maniopoulou, M., Vassilopoulou, V., 2018, and further elaboration by authors.

CHAPTER 6. How to integrate UCH in MSP? Steps to follow.

Steps to follow

Maritime spatial planners should be aware that UCH is one of the uses of the sea. However, as previously mentioned, contrary to the situation for natural resources, management and protection of UCH cannot be directly addressed by coastal states beyond the Contiguous Zone. Consequently, conservation, protection and the sustainable management of UCH can only be attained through the regulated and spatially organised allocation of human activities that may directly or indirectly impact and compromise valuable resources, such as the natural and cultural assets of a marine area while creating synergies between the competing uses. Here lies the value, relevance, and responsibility of MSP. Reflecting on the above, the incorporation of UCH into MSP should follow some indicative steps:

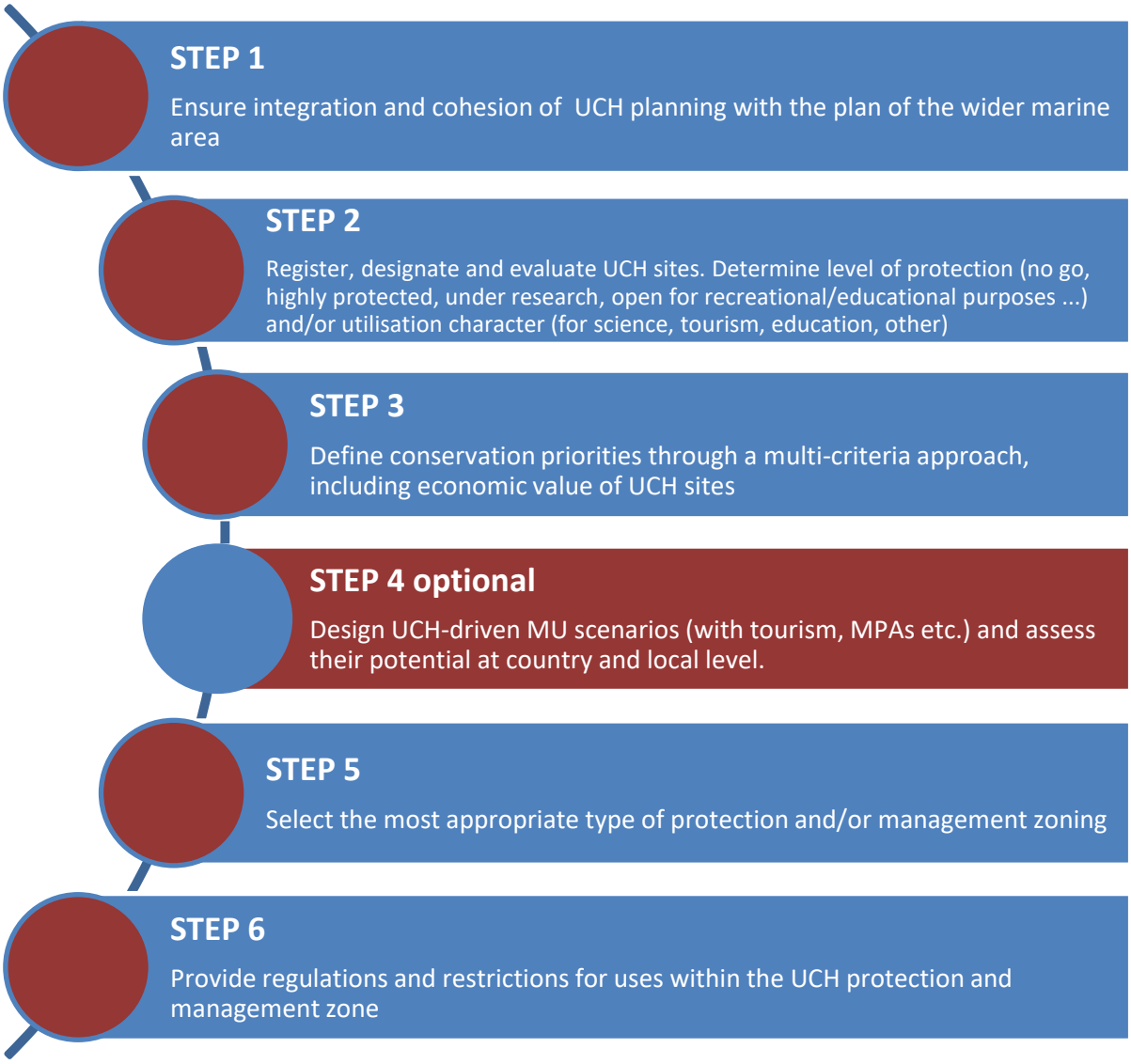

Figure 10. Indicative Steps to follow for incorporating UCH in MSP
Source: Own elaboration by authors and Papageorgiou 2019

These planning steps are indicative and non-exhaustive. It is also evident that the relevant stakeholders must be engaged and involved from the very beginning of the Plan and provide their

knowledge and suggestions for adaptive management at each of the above steps. Permanent cooperation at an early stage with all MSP stakeholders is a prerequisite for the successful incorporation of UCH in MSP.

As for the optional STEP 4, one should bear in mind that, despite the fact that the need for optimised use of marine space seems to be the most important argument in favour of MU, the "*co-existence dilemma*" is addressed differently in different areas, and between different sea-basins (Kyriazi et al., 2016). In most areas there is no clear urgency for co-existence and therefore no dilemma. However, when UCH-Tourism-MPAs co-existence is pursued, the extent of absolute protection (e.g., no-go/no-take areas) is to be discussed. This is necessary to avoid uncertainty, as far as the appropriateness and efficiency of the compensatory measures is concerned. Hence, the potential of this MU should be carefully assessed to facilitate decision-making on the eligibility of the option. The results of such an assessment are presented in Box.11 above. Another important issue is that the dot-based data should be interpreted and analysed into areal data. This allows the move from geolocations to data description, which in turn can be incorporated into the planning documents and MSP. This is the case in Finland, which has successfully carried out this task (see Box.7 above)

There are also some functional components (see Box.12 below) to be included, concerning the organisation of data and maps.

Box.12 Functional components to be established for the integration of UCH into the national MSP

- Institutional set-up to provide, update and document the relevant information/datasets;
- Proper database with clear categorisation and description of the assets;
- Delineation of the "to-be-established UCH" site including location map and the description of the assets;
- Classification according to the Status of incorporation (under investigation, recommended, potential – introduced and under development, established and regulated, under revision etc.) into the national planning documents (Maritime Spatial Plans or others).

Source: BALTICRIM Project

An action plan to promote UCH-driven MU

To promote UCH-driven MU, all EU Member States need further strengthen the national legal frameworks on UCH protection (including possible ratification of the UNESCO Convention for the Protection of UCH). MSP and other place-based management approaches should be used as an opportunity to become better informed about respective UCH sites and have a systematic approach to UCH management regarding which sites can be opened to tourists and which should be strictly prohibited.

Another suggested action is to enhance cooperation between UCH authorities, diving centres, regional authorities, tourism operators, and business investors in order to:

a) co-design approaches, guidelines, and training for divers to access UCH sites without damaging them;
   and
b) co-create 'dry' UCH tourism activities which showcase the 'culture of the sea'.

Furthermore, research and technological development support is required to improve the identification and analysis of UCH sites. To make all the above a reality, financing will be required, in particular innovative financial mechanisms for UCH management and value development such as increasing controlled public visits, developing UCH related retail activities and investing in UCH research, digital museums, underwater technologies, etc. Box.13 below presents a more analytical action plan.

Box.13 – An action plan to promote UCH-driven MU		
Domain	**Actions**	**Potential actors to be involved**
Coordination and Integration	Establish working groups/ intersectoral committees to identify UCH sites and innovative ways of accessing and promoting UCH.	Government authorities, NGOs, management bodies of MPAs, scientific community, fishermen and scuba diving clubs.
	Establish relationships between different countries and national authorities to address issues in relation to UCH robbery and controlling imports of artefacts obtained from waters.	Customs services, the Police and Naval authorities.
	Explore approaches to include professional divers and diving clubs with controlled access and monitoring activities to ensure effective management and preservation of UCH (e.g., organising workshops with diving clubs illustrating the characteristics of the sites and discussions on how to request diving permits).	Diving centres and local authorities.
Research and Technology	**Explore UCH sites using underwater technologies** in order to provide tourists with visual access and authentic experiences of underwater ruins/wrecks (e.g., 3D virtual visits to UCH sites, 360-degree filming, dedicated boats, ROVs and other like technology)	Government authorities, Research Centres
	Develop guidelines on how to establish underwater parks or trails.	
Promotion and dissemination	**Inform and develop public awareness campaigns** regarding UCH by cooperating with other tourism operators and activities on offer. This should include greater attention to tour and exhibition opportunities as well as films and publications for planning archaeological excavations.	
	Promote submerged sites and provide responsible access to the public, selecting some UCH sites to open for visitors while leaving others closed (within or outside MPAs). Also, creating replica sites to steer tourists away from the original one can help in safeguarding particularly valuable UCH.	
	Develop a database of UCH for sea basins, identifying sites suitable for regulated touristic use and sites where access is to be prohibited and share this information with the public	
	Offer heritage-focused dive courses as part of 'normal' training activities by diving clubs or specialised NGOs. Promote cultures of the sea, including seamanship traditions, expertise, professions, historical marine routes, etc.	
Institutional measures	Convince as many States as possible **to agree on and ratify the CPUCH,** and for those who are yet to consent to apply its principles especially to areas beyond where national jurisdictions are concerned.	International organisations (e.g., ICOMOS) and Regional Sea Conventions such as HELCOM, OSPAR, and UNESCO.
	Develop a code of conduct to regulate tourist and diving activities at UCH sites. Potential rules within such a code of conduct include not touching UCH objects, keeping	National Authorities for UCH diving centres,

	within a certain distance from the site, and refraining from deliberately disturbing sediment.	and innovation programmes under grant
	Create or improve sub-national regulations and sectoral policies focused on removing barriers to MU, targeting cross-border sector needs and opportunities. Make use of other existing legal frameworks and policies such as MSP and other place-based management approaches t**o regulate and promote UCH management.**	National Authorities for UCH, Competent Authorities for MSP and local authorities.
Capacity Building	Promote training schemes and courses, to increase awareness and appropriate conduct for recreational divers. Such courses and training should be generalised and also include information about the circumstances and materials of the wrecks (and the UCH sites in general) to **ensure that divers understand their value.**	Such training courses are already offered by: 1. Nautical Archaeology Society (NAS) International Education Programme delivers courses (incl. e-learning) in nautical archaeology and diving, to build skills and experience, allowing participants to take part in projects and fieldwork around the world. 2. The German Federation of Sport Divers (VDST), that teaches scuba-divers about the sensitivity of archaeological sites and provides a code of conduct, legal basis and basic surveying skills.
Funding	Align sources of funding at international (e.g., UNESCO), national, departmental, and local levels, and between sectors.	Sectorial ministries and national agencies dealing with environmental protection, archaeology, UCH, and tourism.
	Enhance collaboration between actors to fund research protecting UCH. Co-operation between dive centres and authorities can ensure that funds are raised with permission to access the sites, provided they agree on how to control site integrity and monitor it regularly under the guidance of a certified underwater archaeologist.	Diving centres, UCH authorities, and underwater archaeologists.
	Encourage retail activities, as well as gift sales of appropriate and varied merchandise, which can be an important part of the visitor experience and an important revenue source promoting local culture and identity.	UCH authorities in cooperation with tourism operators
	Organise charged and controlled public visits to UCH where divers can watch sites during the process of project and research work.	UCH owners and operators in cooperation with tourism operators.
Sources : *Depellegrin et al. 2019* *Kyriazi et al. 2018, and further elaboration by authors.*		

Box. 14 An example of good practice: The Nordic Blue Parks project, 2011

The Nordic Blue Parks project (Finland, Sweden, Norway, and Denmark) combined underwater nature and cultural trails (wreck trails and trails at other anthropogenic sites and constructions under water). Access to protected wrecks is controlled to avoid damage and licensed guides accompany divers. Non-divers access the UCH on-board boats equipped with remotely operated vehicles (ROV) or on land through exhibitions organised by the local tourist office and the local historic community association. The project provided case-studies of regional and local success stories, thereby assessing the possible synergistic effects of cross-sectoral working with both nature and cultural heritage bodies.

For more info please visit: http://norden.diva-portal.org/smash/get/diva2:700574/FULLTEXT01.pdf

Box. 15 - The BLUEMED INTERREG-MED Project, 2016-2018

The project's key objective was the valorisation and protection of underwater natural and cultural heritage in accordance with UNESCO 2001, and to raise public awareness and attract tourism. It focused on: a) a process scheme for supplying local/regional authorities with a multi-disciplinary plan (management models, innovative technologies) for Underwater Museums, Diving Parks and **Knowledge Awareness Centres (KACs)** developed in Capo Rizutto, Baia Bay, Western Pagasitikos/Sporades and Cavtat sites (policy recommendations, management practices, networking and promotion); b) promoting innovation in the diving industry and improving divers' experiences through innovative diving services and technologies; c) attracting a large amount of the increasing number of people who choose diving tourism; d) introducing the wider public to underwater cultural heritage by means of 3D immersive visualisation in museum exhibitions and KACs; e) setting up an 'Underwater Natural and Cultural Routes in the Mediterranean' web-based platform for a unified promotion of tourism and networking of Mediterranean underwater natural and cultural heritage sites.

For more info please visit: https://bluemed.interreg-med.eu

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Box. 16 - Promoting underwater cultural heritage in Macaronesia

The Margullar regional cooperation project aims to conserve, protect, and promote the UCH of the Macaronesian territories (i.e., the Canary Islands, the Azores, Madeira, Cape Verde and Senegal) through the creation of a new tourist product. This will improve and diversify local tourism in various regions of Macaronesia, creating employment opportunities in the tourism sector, raising awareness on the importance of UCH, and educating the public on cultural heritage conservation and preservation. The project will result in the creation of a catalogue of UCH assets, as well as itineraries and underwater tourist routes developed for each territory, supported by corresponding documentation. The Margullar project will promote Macaronesian UCH in a responsible, tourism-friendly way and will ensure the long-term enhancement of the cultural heritage.

The "Margullar: underwater archaeological heritage and tourism in Macaronesia" project was supported by the European Regional Development Fund under the Interreg V-A-Spain-Portugal (Madeira-Açores-Canarias (MAC)) cooperation programme for the 2014-2020 programming period.

Source : "Margullar: underwater archaeological heritage and tourism in Macaronesia" project, ERDF, Interreg V-A-Spain-Portugal

Examples of unintentional multi-use: UCH-Tourism co-existence

Greece

Peristera, Greece's first underwater museum (fig.9)

The Peristera shipwreck site is located near the island of Allonissos in the North Sporades archipelago (central part of the Aegean Sea). On 1 August 2020, the first underwater museum in Greece opened at the site. It is also the first ancient shipwreck in Greece to be made accessible to the public, including divers. The site is located at a depth of 21-28m in the north of Kokkalia Bay near the islet's west rocky coast. The remains of the remarkable wooden merchant ship were linked to a possible Athenian vessel (5th century BC) that sunk due to bad weather conditions. Its cargo mainly consisted of amphoras used to transport wine from regions well known for their wine during antiquity. A large number of the amphoras are well preserved and almost untouched by time. The Peristera underwater museum is open to certified scuba divers. The area is still unaffected by mass tourism, creating conditions for alternative tourism projects that can contribute to Blue Growth and sustainable development with no threat to biodiversity and ecosystems. The shipwreck site is located within the territory of the National Marine Park of Alonissos. It represents one of the largest marine protected areas (MPAs) in Europe and is rich in flora and fauna.

Spain

Ria de Arousa, Galicia:

Aries Shipwreck

The Spanish cargo ship Aries, which was sunk in 1977 on its way from Morocco, is one of the most popular shipwrecks in Galicia. The wreck lies at a depth of 21m, with some points reaching 50m, making it the most accessible and visited wreck of the Arausa estuary. As the wreck is in a very good state of preservation, divers are allowed to venture inside and outside the shipwreck and to discover the multitude of marine animal species that have chosen it as their habitat. The dive is open for all levels of divers, who can explore its almost intact structure and enter the cabin compartments, a bridge, an old tube, and the toilets.

Alexander Shipwreck

The Alexander is a 50-metres long Spanish coal cargo ship which sunk in the middle of Ria Arousa in 1961 after running aground on the island of Salvora. The well-preserved shipwreck structure is located at a depth of 33-40m. Surrounded by dark waters and strong tidal currents, with the remnants of abandoned fishing gear all over the wreck, this deep shipwreck is suitable for very advanced divers. Situated in the waters of the Atlantic Islands National Park of Galicia, visitors can observe the colonies of rich marine fauna which inhabit the wreck.

Santa Isabel Shipwreck

The Santa Isabel wreck is known as the Spanish or Galician Titanic, with one of the most tragic nautical stories in Spanish history. It sunk in 1921 near the Isla de Salvora lighthouse taking the lives of over 240 people. The remains of the ship, 15m deep, are well preserved and offer shelter to a multitude of marine species that can be observed in the crystal-clear waters. Visitors can enjoy the well protected coast of Salvora Island, the Ria de Arousa, and the diverse marine life of the Atlantic Islands National Park of Galicia. It is suitable for divers of all levels.

Costa da Morte (Galicia):

Aegean Sea Wreck Dive

The Aegean Sea wreck is accessible to all certified divers. The remains of this vessel rest at a maximum depth of 18 metres right at the sea bed beneath the iconic Tower of Hercules, which is the only Roman lighthouse in the World that is still functioning. The remains of the wreck are home to a great variety of marine species. During the dive, one can observe some well conserved parts of the vessel, such as its engine, boilers, and the hold.

Solway Shipwreck

The 1843 Solway was a luxurious British steam ship that was on its way to the Caribbean when it tragically sunk, after making a stopover on the Galician coast. It is one of the most recently discovered wrecks that is still well preserved. The remains of the 19th century steam vessel rest at a depth of around 27m, nearly 5 miles off the coast of Malpica. The shipwreck offers the opportunity for advanced divers to enjoy the wildlife of Costa da Morte with a large number of marine species.

Wreck Dive El Peñon

The old harbour tug El Peñon, sunk as an artificial reef over a decade ago, is one of Tenerife's best wrecks. The wreck is situated at a depth of 32m near the Tabaiba coast. Due to the depth, the dive is only accessible to advanced divers, who are able to enter the bridge and the engine room. The site offers good visibility and an opportunity to observe a great variety of marine life inside and outside the wreck.

Portugal

River Gurara Shipwreck in Sesimbra

The shipwreck of the River Gurara was a cargo ship, which sunk in 1989 one mile away from the Cabo Espichel. It is now one of the most popular dive sites in Portugal located in an area with beautiful natural formations. The dive starts about a depth of 32m with the boat's iron cable and then leads to the hull, where a short exploration of the ship is possible. Diving is open to experienced divers, who can observe the incredibly diverse cold-water marine life and the unique species of Sesimbra, for which the wreck serves as a refuge.

Shipwreck route underwater archaeology of Cascais (Lisbon area, Portugal)

Cascais is a landmark scuba diving destinations. Cascais Sea Underwater Routes and the Shipwreck Route are two major undergoing projects. The Underwater Archaeology Programme of Cascais has developed an inventory of Portuguese underwater cultural heritage.

The wrecks of the Ocean Revival Park (Portimão, Algarve)

The Ocean Revival Park is the largest artificial underwater park in the world, created with the purpose of attracting the attention of recreational divers who enjoy exploring wrecks. It is one of the best wreck diving spots in the Algarve that offers the possibility of exploring the largest artificial reef. Located near the town of Portimão, along the east side of the artificial reefs of Alvor, the site offers possibilities for exploring the four sunken war vessels that are now a home to the evolving marine ecosystem.

Croatia

Ship-Wreck Diving in Istria

An artificial reef in Istria offers shipwreck diving and the possibility to discover the diverse marine wildlife of the region. The minesweeper HMS Coriolanus has been lying at a depth of 28m since World War II. The tugboat Sara is located at a depth of 25m. Both shipwrecks formed an artificial reef that became a home to various marine animal species.

Explore the Underwater Treasures of Brijuni National Park

The 500m underwater trail in Verige Bay, on the southern side of Veli Brijun, offers a unique snorkelling and diving experience along the natural and archaeological sites in the Brijuni National Park. Visitors can explore the hydro-archaeological site, a part of the ancient luxurious Roman villa from the 1st century, which was submerged due to rising sea levels. The site represents a refuge to multiple populations of marine flora and fauna (including rare and endemic species), with some endangered species that are strictly protected by law.

Italy

Wreck Diving in Sestri Levante

The shipwrecks of Sestri Lavante provide an extraordinary site from a historical and natural perspective. Located in front of the Bay of Fables, several wrecks from World War II offer a diving experience into history in the biologically rich marine surroundings. The most interesting shipwrecks for diving are the Cargo Armato, situated at a depth of 35m, and the Bettolina, lying at 31m.

San Pietro in Bevagna

The site of the sarcophagi from the shipwreck of San Pietro in Bevagna, 3rd century AD, represents an archeological treasure and a unique diving site. Located nearly 100m away from the shoreline of Taranto (near the mouth of the Chidro river), the site covers an area of approximately 150m^2 containing 22 white marble sarcophagi of different shapes and sizes at a depth of approximately 5m. While no wooden parts of the ship were found, it is presumed that the sarcophagi were destined for Rome.

Parco Archeologico Sommerso di Baia

The ancient city of Baia was a popular seaside resort for rich families during the Roman Empire. Most of the site is submerged due to volcanic activity and coastal subsidence. The Underwater Archaeological Park of Baia, established in 2002, prohibited navigational activity in its waters and undertook measures to protect the marine area. The site allows public access for divers to view archaeological remains.

Romania & Bulgaria

Underwater museums of the Western Black Sea (Romania-Bulgaria shipwrecks)

The cultural heritage on the west continental shelf of the Black Sea, from Capul Midia near Constanța (Romania) to Kaliakra Cape (Bulgaria) is open for exploration to the diving enthusiasts wishing to visit the submarines, shipwrecks, ancient barges, and the Soviet submarine from World War II. Shipwrecks can be found all over the Romanian coast to Vama Veche. Besides the ships, the scuba divers can enjoy the spectacular fauna of the Black Sea.

Ireland

[Malin Head Shipwreck]
The area off Malin Head is known for being one of the best places for wreck diving in Europe. It is covered with ocean liners, German U-boats, and Sherman Tanks, the majority of which belong to the times of WW1 and WW2. One of those wrecks, The SS Empire Heritage, sunk in 1944, lies at a depth of 70m, 15 miles to the north-west of Malin Head; its cargo of Sherman tanks is now scattered across the seafloor.

United Kingdom

[Wreck Snorkelling in the Falmouth Area]
Three sites with wrecks (Castle Beach, Silver Steps, and Gyllyngvase Beach) in Falmouth Bay allow snorkelling visits to historical wrecks, while exploring the rich marine environment of Southwestern UK.

[F71 HMS Scylla]
The frigate Scylla, lying in Whitesand Bay (Cornwall, Southwestern UK), represents an artificial wreck site and a popular attraction for scuba divers. The frigate served in the Royal Navy between 1970 and 2003. In 2004, after being decommissioned, it was purchased by the National Marine Aquarium and sunk, creating an artificial reef for divers. The site is very accessible to divers, both outside and inside the wreck.

[Coronation Wreck]
The Coronation was a second-rate ship that wrecked near the Penlee Point (Southeast Cornwall) in 1691. Two main wreckage areas lie 800m apart. The site is popular for shipwreck diving. Among the visitor licences issued for protected sites, the Coronation wreck receives one of the highest numbers.

[SS Mohegan]
The SS Mohegan is a steamship sunk in 1898 after losing its rudder and striking the Vase Rock (the Manacles). The disaster took the lives of 107 people. The site is situated in Falmouth, (Cornwall) and lies at a depth of 15-29m. The site is open to wreck divers.

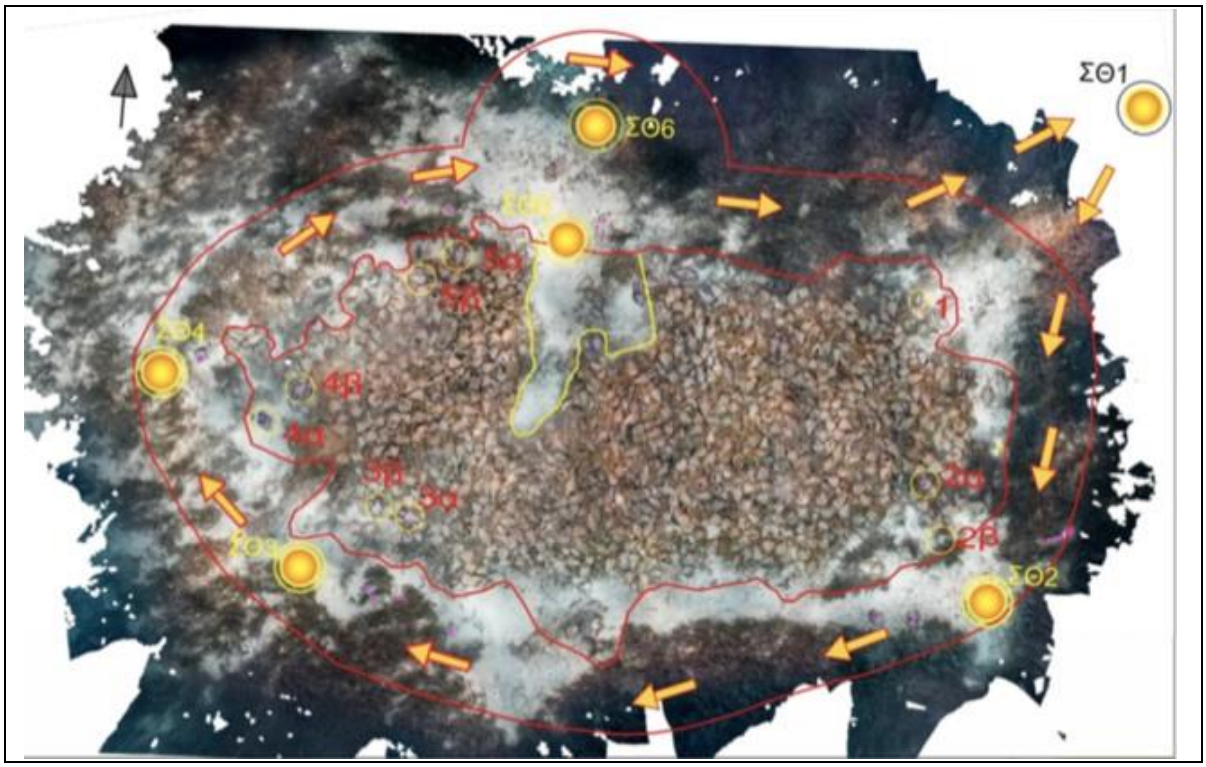

Figure 11. Indicative divers' route, Peristera classical shipwreck, Allonissos island, Greece.

Source: BLUEMED Project (see Box 15)

Figure 12. The Peristera classical shipwreck, Allonissos island, Greece.

Source: BLUEMED Project (see Box 15)

CHAPTER 7. Key challenges, further research and a vision

The key challenges

As already discussed, there are several challenges related to the incorporation of UCH into maritime spatial plans.

- It is crucial to **reconcile/balance sustainable blue economy with UCH preservation**. So far, UCH is considered under a "silo" approach by maritime archaeologists or heritage professionals (Argyropoulos and Stratigea, 2019), that often disregard its potential for assisting local and regional sustainable development goals. Literature strongly associating UCH with risks and challenges related to the blue economy is still very limited. The only project that emphasised the way towards this balance is the MUSES HORIZON2020 Project that explored the opportunities for Multi-use (MU) MSP in European Seas that could guarantee innovation and a blue growth perspective as well as addressing the barriers delaying the application of the MU concept. In this context the MU "*UCH-Tourism-Nature Conservation*" was studied following a methodology developed within the MUSES project that includes a scoring system distinguishing factors that refer to **drivers, added values, barriers, and impacts** (DABI) of each MU (Kyriazi et al. 2016; Depellegrin et al. 2019, Kyvelou and Ierapetritis, 2021)

- A second factor, most important in many sea-basins, is how to adapt to the **effects of climate change.** Nowadays, tsunamis, coastal erosion, and warming waters threaten UCH sites and can lead to the destruction of many of them, due to a change in conservation patterns, change of currents, the introduction of new animal species in waters, and rising sea levels. The impacts of climate change, e.g., increasing temperatures and acidity of the marine environment, can seriously increase the vulnerability of certain types of UCH (e.g., WWI and WWII vessels).
    - This is the case of the **Mediterranean**, perceived as a highly exposed area to climate change impacts (Argyropoulos and Stratigea, 2019). An idea for a more effective and operational inclusion of climate change effects in MSP is the combination of Maritime Spatial Planning (MSP) and Climate Adaptation Planning (CAP) knowledge framework development into a single planning approach. The efficacy of this theory is empirically deployed in the Gulf of Trieste case study, located in the northern Adriatic Basin (Maragno et al., 2020).

- As for the **Baltic Sea**, along with the biological degradation of wooden wrecks that occurs naturally, a special example of a climate change related threat can be observed. Marine borers such as **ship-worm** provoke an acceleration of the process. As reported by UNESCO, good preservation of the wrecks due to the low salinity and temperature of the water and the lack of marine borers is seriously threatened by the spread of marine borers (ship-worm) since the waters are warming and the species have since come to the region.

Hence, it is essential that these changes are considered when planning and executing archaeological surveys and maritime spatial plans. Climate change adaptation and mitigation recommendations for governments and MSP authorities are sorely needed. It is important to note that not all of the recommendations concern maritime spatial plans, some may provide further information on the regulation of activities in the marine environment, or on measures that governments should take to help industries adapt to predicted future changes to the climate. As these adaptations will also affect maritime industries they are indirectly linked to Maritime Spatial Planning. The EU climate change strategy, as adopted by Member States, may be reflected as a constructive step in handling these risks, provided that UCH related requirements are incorporated in the strategy, especially when this is translated to a local and regional planning level.

- A third challenge concerns the effects of offshore industrial activities which are potentially destructive to UCH. In the coming decades, the impact of economic growth and industrial exploitation in coastal zones, combined with rising sea-levels, is likely to exaggerate the risks for UCH. New challenges may arise as well as opportunities for further development of synergies between governmental agencies, local authorities, industrial operators, and scientific and archaeological researchers (Peeters et al., 2020).

- A fourth challenge is how to improve the **economic value of UCH** in order to make **conservation and enhancement of UCH a priority in MSP.** This is more thoroughly discussed in Chapter 3 of this Handbook.

- Finally, the most important challenge is how **to build bridges and synergies between the world of archaeology and the one of Maritime Spatial Planning** at the level of both authorities and of individual scientists and practitioners. More specifically, **evidence-based training programmes for planners** should start, with major contributions from MCH/UCH authorities. Planners should be allowed to have free access to underwater cultural heritage registers (as identified by the BalticRim Project, see Box.7) and a relevant good practice is the "*Review on Finnish Maritime Cultural Heritage*"[17]. Data and maps should be easily accessible and downloadable in user-friendly formats. Planners should also be regularly informed and/or trained about top UCH sites and their blue economy potential. In turn, MS planners must develop processes to ensure the sustainable use of UCH through UCH-driven MU and familiarise maritime archaeologists with such co-existence techniques and know-how. Funding should be ensured by European programmes for capacity building of both professional groups (maritime archaeologists and planners) on how to integrate MCH/UCH into MSP.

Topics for further discussion/research

There are many topics to be explored regarding future research on how to make "*UCH in MSP"* an easier task. Among them, **developing appropriate planning tools to integrate MCH/UCH into real plans is a critical one**. Moreover, the elaboration of **common classification systems for MCH/UCH** is also an idea together with **developing open and low-cost surveying solutions for UCH** and **creating decision-support tools for UCH risk assessment in a changing environment.**

The idea of **underwater cultural landscape** is another critical issue for future research in the spirit of the Council of Europe Landscape Convention (2000). According to the Convention, "landscape" is an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors. The Convention includes land, inland water and marine areas and requires the integration of landscape into planning policies (Tikkanen, 2019; Kyvelou, 2019; Kyvelou and Gourgiotis, 2019). As Barr (2013) evokes, maritime **cultural**

[17] For more info, please visit https://www.museovirasto.fi/en/articles/itameri.fi_opened and https://www.marinefinland.fi/en-US

landscapes are an influential tool for place-based management, since they symbolise not only collective contributions to sustaining and improving places in which people have given special importance, but can also lead to a better understanding of how people have contributed to what they have become, what they have learnt along the way, and how this knowledge may continue to make these places significant for future generations.

A vision

- Tourism is often perceived as a threat to the conservation of Cultural Heritage. In fact, tourism is a platform and a vehicle for interpreting and presenting heritage to the public, conserving it, and warranting its economic and social sustainability. Current discourse on the relationship between tourism and heritage emphasises a major review of the interrelationships between tourism and heritage. A key aspiration is the deconstruction of ancient concepts and the reconstruction of a new collaborative paradigm based on present challenges and constructive and complementary synergies, to equally ensure the endurance, resilience, and sustainability of both heritage and tourism.

- In this context, the "UCH in MSP" endeavour can give birth to a **new form of cultural tourism** i.e., **sustainable underwater tourism** (Ricca *et al*., 2020), as one of the modern tourism industry's most dynamic and developing branches in today's global tourism market. **Underwater cultural tourism** will represent tourism in all aspects, and clearly it will be far more than just cultural heritage. In this manner, the concept of **underwater cultural tourism** could take hold throughout all coastal areas, whose seas host ancient, submerged resources of different kinds, such as structures or individual objects.

- The exploitation of UCH in combination with nature conservation (e.g., close or within MPAs) is also expected to increase the number of tourists visiting an area for its natural and cultural heritage, thus enriching the locally offered tourism product with a heritage dimension. In this way, the efficient assemblage of UCH-driven multi-use can confirm an emerging trend that views heritage on the one hand and tourism on the other as two reciprocally supported social phenomena that are co-produced (Gravari-Barbas, 2020).

- Heritage tourism is particularly important for tourism-dependent local communities – especially now that the pandemic has seriously impacted tourism which will never be the same in the future. The local community may thus be placed at the core of conservation that is consistent with the "value-based approach" to cultural heritage management based on the Burra Charter (ICOMOS, 1999), which focuses on the values that society (consisting of various stakeholders) ascribes to heritage (Kyvelou, 2020).

- The growth of new and differentiated tourist attractions with important economic impacts and positive effects will stimulate increasing interest from countries in such alternative forms of sustainable tourism. These alternative forms of tourism will be perceived as a response to the significant number of countries which still lack specific strategies for managing their UCH.

CHAPTER 8. Recommendations

UCH in MSP: a change of paradigm?

As already discussed, economic activities at sea are exerting increasing pressure on underwater cultural heritage sites, which are vulnerable to damage and require special conservation and protection measures. In an era of rapid expansion of coastal and offshore activities and growing demand for alternative tourism activities, but also changing perceptions about conservation (Kyvelou, 2019), UCH is still considered a burden to economic development. Nevertheless, this negative paradigm is being reversed and UCH is considered as an opportunity for maritime spatial planning beyond being a process for allocating the different marine uses.

However, despite the growing acknowledgment of the above, mainly by the scientific community and the European Commission, which is supporting this evolution via several relevant projects (i.e., the TECTONIC project[18], the iMARE CULTURE project[19], the already mentioned BLUEMED and BALTICRIM Projects etc.) and via mechanisms to assist EU Member States[2021], there is still limited incorporation of UCH into MSP. There are still substantial differences at the sea-basin level and at the national and regional levels. For example, not all EU Member States have ratified the UNESCO Convention on the Protection of the Underwater Cultural Heritage. Moreover, although maritime spatial plans are expected to designate appropriate and inappropriate areas for development, UCH tends to be represented as **spots** (dots on the map) (Altvater, 2018), that are relatively few in number and in most cases are protected and therefore designated as "no-take" or "no-go" areas. However, the historic environment is much wider than this, and is inappropriately represented by spots on a map, as there are considerable uncertainties in relation to the presence, nature, and value of features. Another obstacle is the weak communication and cooperation between UCH and MSP authorities.

The following recommendations are inspired from varied experiences, projects, and events, among them the BALTICRIM project[22] and a very productive seminar on 'Marine Spatial Planning and the Historic Environment', organised in connection with the 2012 European Maritime Day to provide a forum for marine and historic environment professionals from across Europe to discuss the relationship between archaeology and maritime planning (Firth, 2013).

Recommendations from a MSP perspective

- ***General comments***

Underwater archaeology currently only has minor involvement in the development of Maritime Spatial Plans internationally. At the same time, underwater archaeology has a potentially large role to play in elaborating the relationship that people have with the sea, both in the past and in the present. Besides, archaeology has been seen, quite rightly, as an environmental concern. The relationship with environmental interests should be intensified, especially as archaeological material is also a '*habitat*' and can provide an important ecological resource where, for example, wrecks of historic interest provide a stable hard substrate where the seabed is otherwise soft or mobile. Through maritime spatial planning, planners can explore UCH as a component of **multifunctional** sites; shipwrecks, for example, can have historic character, an ecological value, specific social value for those connected with the ship through family ties, and may also be a valuable focus for recreational diving, angling and other economic activities.

A useful approach would be to start identifying places that have value, and then work out what their values are from different perspectives. Archaeologists have a specific responsibility to safeguard important sites, but this should not impede a more outwardly engaged approach with maritime planners and other stakeholders to increase access and use **where it is consistent with the conservation of heritage assets and produces added value.**

Archaeologists need to be conscious of the scales at which maritime planners operate and adapt their input to appropriate levels of detail. As archaeology has such a multi-faceted character, it can play a role in a wide range of maritime planning policies: environmental, economic, and social.

Finally, within the MSP process, **MCH/UCH should be considered as a very relevant use to promote the Multi-use concept in the marine space,** which can have multiple benefits for society, the economy and the environment.

[18] Technological Consortium TO develop sustaiNabIlity of underwater Cultural heritage, please visit https://www.tectonicproject.eu

[19] Advanced VR, iMmersive serious games and Augmented REality as tools to raise awareness and access to European underwater CULTURal heritage**,** please visit https://imareculture.eu

[20] Such a mechanism is the European MSP Platform (https://www.msp-platform.eu).

[21] Black Sea Assistance Mechanism, Western Mediterranean Assistance Mechanism, Atlactic Action Plan 2.0

[22] https://www.submariner-network.eu/images/BalticRIM_final_publication_Dec2020-1_compressed.pdf

- ***Sharing knowledge and experience***

- Require archaeologists, maritime planners, and other stakeholders to work together in maritime planning and not merely after decisions have already been made. The Valletta Convention and more recent instruments (e.g., the Faro Convention), that take into consideration the public and community benefits, are being implemented in respect of planning decisions for maritime developments around Europe;
- Take a step back and look at the enormous range of local archaeology and history societies based at or near the coast who are likely to have views on maritime management;
- Identify and visualise the UCH resources of each sea-basin, for potential use by planners, decision-makers, and creative industries;
- Promote UCH in general, as it plays an important role in creating and enhancing well-being, quality of life, identity, sense of place, social capital, towards sustainable blue economy. Cultural heritage connects people and generations to each other and to the past and helps guide the future.
- Disseminate good practices, such as the "Code of Good Practice for the Protection of the Underwater Heritage of the Baltic Sea", among MSP planners and other relevant groups in maritime sectors;
- Discover new ways of raising awareness, not only on the heritage data, information, and knowledge, but also on UCH as one of societal assets and factors to be considered in development plans.

- ***Maritime spatial planning policies and decision-making***

- In any particular Maritime Spatial Plan, it is likely that insufficient attention will be given to UCH to include neccessary detail and explanation for planners, developers, other stakeholders, and the general public. Rather than squeezing all the relevant details into the Maritime Spatial Plan itself, the model provided by Firth (2013)[23] in a consultancy project intended to inform English Heritage about maritime planning methodology, concerning "Supplementary Planning Documents" to support maritime plans merits serious consideration.
- Consistent with the point above, it is very important that the historic environment becomes engaged with [fits into] maritime planning, across all dimensions of sustainable development. It is essential that the relationship between the historic environment and the social and economic pillars of sustainable development is examined .
- Social and economic considerations should not make us forget that there are also positive interactions with the natural environment, such as the role of wrecks as habitats. From this perspective there is a clear scope to incorporate UCH within the assessment of Good Environmental Status, and therefore within Maritime Strategies. Too often, environmental perspectives are conceptually blind to the effects of human activity on coastal and marine environments over many centuries, as is the case for wrecks.

- ***Planning processes***

- There is a need for maritime heritage managers – for example through the European Archaeological Council (EAC) or European Association of Archaeologists (EAA)– to engage with the European Commission, especially DG MARE and DG ENV, to re-establish the role of UCH/MCH in future European development. Reference should be made to DG REGIO and the Territorial Agenda TA2020, where there appears to be a greater recognition of the value of the historic environment as a positive source of growth. For example, facilitating integration between land-based historic environment policies and Maritime Spatial Plans could be a focus at the planning stage. Local government archaeological officers should be mobilised and encouraged to engage in Maritime Spatial Planning

[23] See https://historicengland.org.uk/images-books/publications/marine-spatial-planning-historic-environment/5460mainfinal_report_140213/ where he discussed "Supplementary Planning Documents" to support maritime plans :

- ***Supporting the work***

- Explore the relationship between the historic environment and social and economic development on the coast, to include collating quantitative evidence. Current approaches to socioeconomics and ecosystem services acknowledge that they have not fully accounted for cultural heritage and that further research is required.
- Make data widely available and provide opportunities for people to add their own data using participatory procedures and tools (e.g., PPGIS). Increase seabed surveying with an archaeological component in advance of making plans. Mapping heritage assets should start with an informed coexistence approach rather than exclusion. Map how development should proceed and show areas with potential. For protection of historical sites like wreck cemeteries, zoning would be an appropriate planning tool. Nevertheless, other tools should also be tested. Maritime planners need archaeologists for guidance and archaeologists need to be prepared to provide such assistance in a collaborative way. Marine archaeological mapping and GIS initiatives require common platforms to enable continuing access, updates, and harmonised standards.
- Archaeological heritage should be considered in the course of Strategic Environmental Assessment (SEA) when assessing maritime plans where SEAs may be useful in assembling baseline archaeological data for a whole region. Given that an SEA is strategic in outlook, it may be appropriate for the archaeological component to focus less on mapping what is known and more on the key archaeological themes that are important and may be affected – positively as well as negatively – by the plan or programme in preparation.
- Environmental Impact Assessment (EIA) plays a fundamental role in addressing the potential impacts of maritime developments on UCH and is a legal requirement for major schemes irrespective of Maritime Spatial Planning. Nonetheless, MSP could play an important role in guiding the scope of the cultural heritage component of EIA in any particular marine area, helping to provide certainty to developers. In return, the conduct of archaeological investigations in accordance with the findings of EIA can provide firm data about the marine historic environment that can help refine future maritime plans, and the conduct of subsequent EIAs.

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