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The Innovative and State of the Art Public Access Management of Malta's Underwater Cultural Heritage

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Abstract: The obligation to preserve underwater cultural heritage is a core principle of the UNESCO Convention on the Protection of the Underwater Cultural Heritage. A key element of this obligation is a balance of scientific research, protection, and the promotion of responsible access to underwater cultural heritage sites. Such a balance requires the setting up of a network of communication between the tourism and heritage sectors on the one hand and the maritime and diving communities on the other hand. A variety of approaches have been developed to promote responsible access to underwater cultural heritage sites, and since the vast majority of the public does not dive, this also includes the development of virtual access. In Malta, maritime archaeology can be traced to humble and sporadic beginnings in the 1950s. The following decades brought a growing interest in diving activities and a rising number of diving schools and clubs. Whilst Malta has today established itself as a diving tourism destination, responsible access to underwater cultural heritage sites was not always entrenched in dive operations or institutionally recognized. The protection and management of underwater cultural heritage has recently been firmly established within Heritage Malta, the national agency for museums, conservations, and cultural heritage. This paper is intended to outline the trajectory of Malta's underwater cultural heritage management and to present the innovative and state of the art public access system that is managed by the Underwater Cultural Heritage Unit within Heritage Malta.

Keywords: Underwater Cultural Heritage; heritage management; public access



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1. Introduction

The Maltese Islands are located in the centre of the Mediterranean, at the crossroads of the east–west and north–south divide. Its central location has created an inextricable link between the history of Malta and the maritime history and activity of the Mediterranean Sea (Figure 1). The earliest ceramic remains from the site of *Għar Dalam* on Malta provide evidence of human occupation that can be traced to 7000 cal BP. The ceramic evidence shares decorative elements with the Neolithic occupation of Stentinello, Sicily, providing a maritime connection between the two islands [1,2]. The megalithic stone remains, or 'temples', of Malta's Late Neolithic period (6100–4500 cal BP), have been described as having 'a very special relationship to the sea' [3] (p. 260). The sea levels of Late Neolithic Malta were the same as today, and Grima (2005) [3] argued that the distribution of monuments in the landscape at locations with access to the sea provides evidence for travel and subsistence considerations [3]. Maritime connections have also been established through the presence of imported objects such as obsidian from Lipari and Pantelleria and red ochre, flint, and miniature axes traced to Calabria and Mount Etna, Sicily [1,2]. Later periods of Maltese history, such as the Phoenician, Punic, and Roman periods, are well-documented both on land and underwater, a prime example being the Punic Temple located at the tip of the *Ras il-Wardija* promontory and the Phoenician shipwreck located off the same promontory at a

depth of 110 metres [4]. The majority of known UCH sites are First and Second World War wrecks, poignant reminders of naval and aerial battles that took place off the coast of Malta and Gozo. The cultural and historic value of these unique UCH resources are a reflection of the connection between the sea and the development of Malta's human story, establishing a permanent connection between the sea and culture. Since 2019, Malta has implemented an innovative public access management system aimed at providing regulated access to historic wreck sites. The aim here is not only to promote the islands as a prime destination for technical diving but also to instil a sense of cultural and historical awareness in visiting divers and the wider public. This paper highlights how UCH management has developed in Malta, focusing on the recent formation of the Underwater Cultural Heritage Unit (UCHU) within Heritage Malta, the national agency for cultural heritage. Emphasis is placed on the public access system launched by the UCHU, as well as the various other initiatives being implemented.



Figure 1. Map of Malta and its wider central Mediterranean context. © Google Earth 2021.

The following section provides insight into the development of underwater archaeology in Malta, providing a wider context to the implementation of the UCHU's management framework.

1.1. Development of Underwater Archaeology in Malta

Terrestrial cultural heritage has been actively explored, excavated, documented, and published since the late 19th century and likewise reflected in the history of heritage legislation in Malta. The seabed, however, was beyond reasonable human reach until the 1940s with the development of the first operational self-contained underwater breathing apparatus, as well as the resulting spread of recreational scuba diving in the 1950s [5]. Malta's coastal waters were soon being explored by both local sports divers and foreign visitors. By 1959, the first officially documented, albeit sporadic, archaeological discoveries were being reported from an underwater context. The first reported discovery involved a case of mistaken identity, where what was initially assumed to be an unexploded ordinance was in fact a Graeco-Roman amphora [6]. This led to the creation of the Malta Underwater Archaeological Research Branch of the International Institute of Mediterranean Archaeology. Launched in June 1961, it represented the first Malta-based group with a specific focus on the submerged cultural remains of the Maltese Islands [7]. It also coincided with the 1961 Imperial College of London diving expedition to Xlendi, Gozo. This project saw the recovery of a number of archaeological objects, as well as the first ever underwater survey of the seabed of Xlendi Bay. Of note is the fact that this was accomplished at depths

considered to be outside the recreational diving limits, pushing the boundaries of diving practices [6–8]. The Museum's Annual Report (MAR) for 1961 noted that the 'results from this new branch of research continue to accumulate. The Museum's grateful thanks are due to the various diving teams who have helped' [9] (p. 6).

The following year saw the continued recovery of objects, with a number of anchors discovered. Of particular note is the mammoth four metre, two-tonne Roman anchor stock found by the RAF Subaqua Club in St Paul's Bay [10]. In 1963–1964, underwater research initiatives continued, with the Imperial College of London team returning to survey caves and expeditions to Salina, Marsascala, and Marsaxlokk being conducted by the Mediterranean Underwater Research Unit [11]. An important discovery was made a year later in 1964, when the Mediterranean Underwater Research Unit discovered a number of mortaria sherds in Mellieħa Bay [11]. Excavated by Honor Frost in 1967, the so-called Mortar Wreck is located approximately 700 metres from shore at a depth of 14 metres. A number of soundings were carried out, and any surface objects were documented, collected, and registered. The wreck site area was also fully mapped and surveyed, making this the first scientific underwater archaeological excavation in Malta. The mortaria constituted the bulk of the cargo, and other objects included pottery, amphorae, frit, glass, and metal dated to the third century AD [12]. The potential for the further study of this site was noted by Frost in 1969, and in 2013–2014, the University of Malta, in collaboration with the Honor Frost Foundation, returned to the site with the intention of discovering whether any cultural material was still present and to explore further areas of potential investigation that were noted in previous remote sensing exercises [13].

Whilst the 1970s and 1980s represented a silent period in Maltese underwater archaeological activities, a rise in the illicit recovery of objects can be noted. Already in the early 1960s, a correlation between the increasing numbers of divers and the illegal recovery of objects was noted, along with the need for appropriate legislation to regulate and protect UCH [7]. In 1964, the Malta Federation of all Underwater Research was set up under the auspices of the Museums Department, seemingly to closely monitor the various ongoing underwater research projects [11]. In 1975, the Museums Department attempted to limit diver access to a number of bays, intending to curb the illegal recovery of objects. A list of conditions including a ban on diving in four reserved localities was imposed on dive schools. This included all areas where archaeological remains had been reported, and as more reports on UCH were made, more sites were added to the list [14]. Consequently, the Museums Department enacted a policy of 'better safe than sorry', banning access to any reported site. The archaeological importance of these reserved localities was not properly assessed due to the limited personnel qualified in underwater archaeological investigations. Therefore, inhibiting access, regardless of archaeological potential or value, was considered to be the only means of protection. However, by the 1990s, this approach became unfeasible due to enforcement difficulties and the increasing number of reported discoveries that would have resulted in the majority of the territorial sea of Malta being closed to divers [14]. It would be decades before legislative changes would introduce the explicit protection and management for UCH in Malta.

Underwater archaeological research remained on the back-burner until the late 1980s and the arrival of the British-led Specialist Archaeological Survey (SAS) project. Particular focus was placed on the Grand Harbour and St Paul's Bay, where side-scan sonar and sub-bottom profiler surveys were conducted and diver surveys were carried out on potential target anomalies [11]. Foreign-led projects continued with the arrival of the French *Département de Recherche Archéologique subaquatique et Sous Marine* (DRASSM) in 1991. This Franco–Maltese partnership lasted another two years and saw the first ever training of local archaeologists in underwater archaeological techniques. Thus, whereas previously Malta's UCH exclusively relied on the expertise of foreign specialists, Maltese professionals could now take the lead. In 1993, the first underwater archaeological excavation since the Mortar Wreck was conducted in Marsascala Bay, a collaboration between the Museums Department and DRASSM. Harbour-dredging activities led to the discovery of cultural

material and an ensuing rescue excavation. Cultural deposits were discovered beneath *Posidonia oceanica* mattes, and the relative homogeneity of the deposit led excavators to consider the presence of a single wreck containing oriental amphorae. However, these lay in close proximity to other objects that, due to their varied chronology, were classified as harbour debris [15]. The late 1990s saw the involvement of the Institute of Nautical Archaeology in Malta, resulting in three years of collaboration. Remote sensing surveys were carried out, and in June 2001, a preliminary excavation that saw the involvement of local professionals was conducted in Lazaretto Creek. In 2002, Timmy Gambin conducted a remote sensing exercise in Dockyard Creek, followed by the excavation of a sondage that revealed a large number of artefacts and highlighted the archaeological potential of harbour deposits [11]. In 2006, a long-term remote sensing survey was initiated. This was intended to survey the entirety of Malta's territorial seabed with the aim of creating a geodatabase of underwater cultural assets [16]. In 2007, as part of this ongoing remote sensing project, an archaic shipwreck was discovered. Located at a depth of 110 metres, the excavation of the site begun in 2018 and has since resulted in the recovery of a number of objects, including amphorae, urns, grinding stones, and wooden fragments [17]. Gambin et al. 2021 [18] provided an in-depth insight into how the discoveries made as part of this ongoing remote sensing project feed into Malta's UCH management framework.

The trajectory of underwater archaeology in Malta has evolved from one led entirely by foreign institutions in the 1960–1980s to projects, surveys, and excavations being directed by local professionals from the 1990s onwards. This path has continued, and since 2016, a dedicated master's programme in Global Maritime Archaeology has been offered at the University of Malta. The following section presents the legislative framework within which Maltese cultural heritage is regulated.

1.2. Legislation and Underwater Cultural Heritage

The need for the controlled monitoring of underwater sites was already noted in the 1960s; however, this was not acted upon until 2019. In contrast, terrestrial heritage sites have benefitted from legal protection since the late 19th century, beginning with the Permanent Commission for the Inspection of Archaeological Monuments set up in 1881. This was followed by the 1910 Ordinance and the 1925 Antiquities Protection Act, which remained in place until the Cultural Heritage Act of 2002 [19]. Of note is the fact that UCH was not accorded the explicit protection or management considerations in any of the abovementioned legislative frameworks. The Cultural Heritage Act of 2002 saw the dissolution of the Museums Department and the setting up of a cultural heritage regulator, the Superintendence of Cultural Heritage, and an operator, Heritage Malta. The Act defined cultural heritage as:

‘movable or immovable objects of artistic, architectural, historical, archaeological, ethnographic, palaeontological and geological importance and includes information or data relative to cultural heritage pertaining to Malta or to any other country. This includes archaeological, palaeontological or geological sites and deposits, human remains, landscapes, underwater and seascapes, groups of buildings, as well as scientific collections, collections of natural specimens and art objects, manuscripts, books, published material, archives, audio–visual material and reproductions of any of the preceding, or collections of historical value, as well as intangible cultural assets comprising arts, traditions, customs and skills employed in the performing arts, in applied arts and in crafts and other intangible assets which have a historical, artistic or ethnographic value’. [20] (Article 2)

Article 3 further specified that:

‘For the purpose of this Act, an object shall not be deemed to form part of the cultural heritage unless it has existed in Malta, including the territorial waters thereof, or in any other country, for fifty years, or unless it is an object of

cultural, artistic, historical, ethnographic, scientific or industrial value, even if contemporary, that is worth preserving'. [20] (Article 3)

Whilst underwater remains are included in these definitions, the 2002 Act did not make provisions for the explicit protection and management of UCH. It was only in 2019 that an important and long-awaited amendment was passed, with Act No. XIX. For the first time, provisions were made for UCH in Malta's heritage legislation. This defined UCH as 'remains found on the seabed that are situated in the territorial waters of Malta and are at least fifty years old' [21] (Article 44 (1)). The amendment also included:

- The creation of protected zones (Article 45).
- The requirements for custody of UCH (Article 46).
- The granting of permits for the exploration or recovery of shipwrecks and relics (Article 48).
- The duty to report the discovery of shipwrecks and relics.

The 2019 amendment provided the foundation for the proper protection and management of Malta's UCH, and this recognition of responsibility consequently resulted in the decision to 'create a platform for the protection, valorisation, management and public outreach' [19] (p. 54) of Malta's UCH, realised through the creation of the UCHU within Heritage Malta. The amendment to Malta's cultural heritage legislation was borne out of the recognition of the inherent values of UCH—cultural, historical, archaeological, scientific, and socio-economic—and paved the way for the setting up of the UCHU and the implementation of best practices in the management of UCH.

2. UCHU and Its Functions

The UCHU was created out of the recognized need for an entity solely responsible for the protection and management of Malta's UCH. The approach implemented by the UCHU is an innovative management system for access and protection, based on the principle that access to underwater sites should be accorded the same level of attention as terrestrial sites. Whilst all UCH sites are now protected by local heritage legislation, not all sites fall under the management of the UCHU. The integration of UCH in Malta's heritage legislation was the first step towards fully integrating UCH management in Malta, which ensured that the necessary infrastructure for the proper management of and best practice for UCH were in place for the eventual ratification of the 2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage [22]. What this entails is that the framework set up UCHU closely follows the main principles, code of ethics, and best practices laid out by the Convention. According to Dromgoole (2013) [23], the 'overall management objective is the preservation of UCH for the benefit of humanity' [23] (p. 307). The three core principles of the Convention are: (1) preservation in situ; (2) long-term preservation of sites, objects, and any recovered material; and (3) responsible non-intrusive access [22,23]. The management infrastructure set-up by the UCHU closely follows these principles, and the functions of the Unit are a reflection of the practical applications of the Convention.

The public access system implemented by the UCHU followed the path of site discovery, the identification of threats, the creation of stakeholder synergies, the establishment of principles of protection and best practice, and the launch of an online booking system. The establishment of a system of public access where previously there was none was a complex issue due to the high number of interested parties, i.e., stakeholders, and their vying interests. Stakeholders are composed of private and public entities, all with interests related to UCH. However, whilst these interests often overlap, they do not always align [24]. An example of where stakeholder interests can be seen as a hinderance to UCH management is Italy, where Secci and Stefanile (2016) argued that whilst the necessary legislation is in place, collaboration amongst the various stakeholders is lacking [25]. A noted exception is Sicily, where the Soprintendenza del Mare was created in 2004. The focus here is on a multi-disciplinary approach to UCH management that is inclusive of all aspects of underwater and coastal archaeology, as well as elements such as traditional boat building and archival research. The Soprintendenza del Mare has also focused on public

access through the opening of a number of underwater archaeological parks, such as Gadir in Pantelleria and Falconeria in Ustica [26].

The identification of stakeholders in the UCH value chain and the dynamic of their relationship was a crucial element in the implementation of the UCHU's new management and public access system. Stakeholders were identified based on a survey of different sectors with the aim of gaining a deeper understanding of the various relationships between stakeholders and the impacts and interests these have on UCH sites (Figure 2). The various stakeholders were invited to focus groups where the initial emphasis was centred on sparking a change in the attitude towards UCH and on raising awareness of the importance of protecting and managing these assets. However, it should be kept in mind that these initial meetings were held following a change in legislation in 2019, which introduced policies on safeguarding underwater cultural assets and regulating access for the first time.

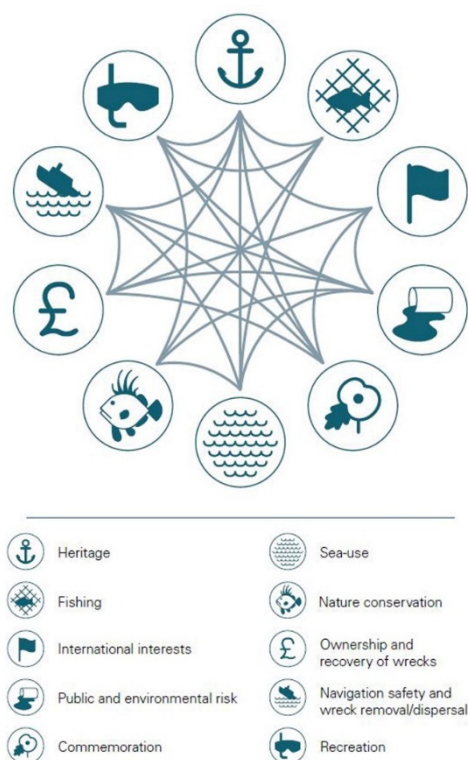


Figure 2. Diagram indicating the complexity of stakeholder interests regarding UCH sites [24] (© Honor Frost Foundation).

Stakeholders were divided into different focus groups, all composed of those with a general connection to UCH such as government institutions and the maritime and diving sectors. These were further subdivided into those stakeholders affected by the new access initiative and those that could be involved in the protection and monitoring of sites. Stakeholders most affected by the public access system were dive centres, dive clubs, dive boats, and the fishing community. Workshops and meetings were held in order to apprise these groups of the new system, as well as mitigate any opposition. This was a challenge since access to historic wreck sites has never been properly regulated and both divers and the fishing community had free reign to visit these sites. However, feedback from these groups was instrumental in refining the rules and regulations that would come to define the protection and public access system. When it came to the protection and monitoring of sites, stakeholders were identified amongst various government institutions. These include the Armed Forces of Malta, Vessel Traffic Service (VTS) Valletta, the Fisheries Department, Police, Transport Malta, the Superintendence of Cultural Heritage, and Heritage Malta. Keeping stakeholders informed and engaged is an important part of ensuring continued collaboration. To this effect, annual meetings are organised between all stakeholders,

though these have unfortunately been put on hold in 2020 and 2021 due to COVID-19 restrictions. A comparison can be made to Algarve, Portugal, where potential stakeholders were identified amongst public and private entities. A qualitative survey was carried out in order to ascertain the relationship between culture, tourism, and the sea [27]. Nunes (2013) [27] argued that whilst a recognition of the cultural and socio-economic values of UCH and the possibility of site access through dive centres was present amongst public and private stakeholders, the policy framework needed to implement a management strategy was not in place. The strategy undertaken by Malta was to include stakeholder suggestions in the policy-making framework, realised through the setting up of a collaborative relationship between stakeholders, and recognised as the first step on the path towards creating an effective management strategy. What follows are the steps taken in order to open sites to public access.

2.1. Site Identification and Evaluation

The University of Malta's ongoing long-term remote sensing project has mapped and studied a multitude of UCH sites around the Maltese Islands. These include sites such as a 2700-year-old Phoenician shipwreck, dozens of aircraft wreck sites, Early Modern shipwrecks, and submarines and battleships from the First and Second World Wars. The aim of this ongoing project is to map the entire territorial seabed of Malta, documenting and identifying UCH sites that will ultimately form part of a geodatabase. It is from this remote sensing data that sites are selected for public access [18]. The selection approach is based on a uniform prioritisation methodology that considers factors of importance and value, as well as the state of preservation and deterioration potential [28,29]. UCH sites are classified along two axes: (1) an evaluation of its local and global historical and natural values and (2) an assessment of its condition and threat values. This system was first developed by the Underwater Research Unit of the Gibraltar Museum, where the aim was to create a rapid evaluation tool based on two questions: (1) how significant is the site? and (2) what is the site's current condition and how likely is deterioration? [28] Rating scores are applied based on these questions, and these scores 'inform on policy decisions regarding site preservation and conservation' [30]. In addition to these scores, the educational and tourism potential of a site is taken into consideration; depth, for instance, must be considered because a site below even the reach of specialised technical divers has less tourist potential than sites located in shallower waters.

Once a site has been identified, a process of documentation is initiated. This consists of desk-based research and 3D photogrammetric surveys (Figure 3) carried out in collaboration with the University of Malta. The process of site evaluation and documentation is an integral part of valorising Malta's UCH, and the document created as part of this process is a record of this valorisation and a depository for all the information pertaining to a site. The 3D surveys are used as baseline records on the condition state of the wreck, and they are used comparatively to monitor further site deterioration. Such an approach is particularly important in Malta due to the high concentration of metal wrecks and the increasing probability of corrosion and an eventual structural collapse [30–33]. The 3D models also have a vital public outreach role because they are used to disseminate awareness and information on UCH sites to all sectors of the public [34], as well as to stakeholders such as dive centres and clubs. In order to maintain authenticity and integrity, sites opened for public access are declared 'Archaeological Zones at Sea'. These declarations are made by the Superintendence of Cultural Heritage, the agency charged with regulating cultural heritage. A declaration sets up a pre-determined buffer zone and regulates the types of activities that are accepted or prohibited in these zones. This process is repeated annually, and 16 sites have been opened to the public since the establishment of the UCHU.

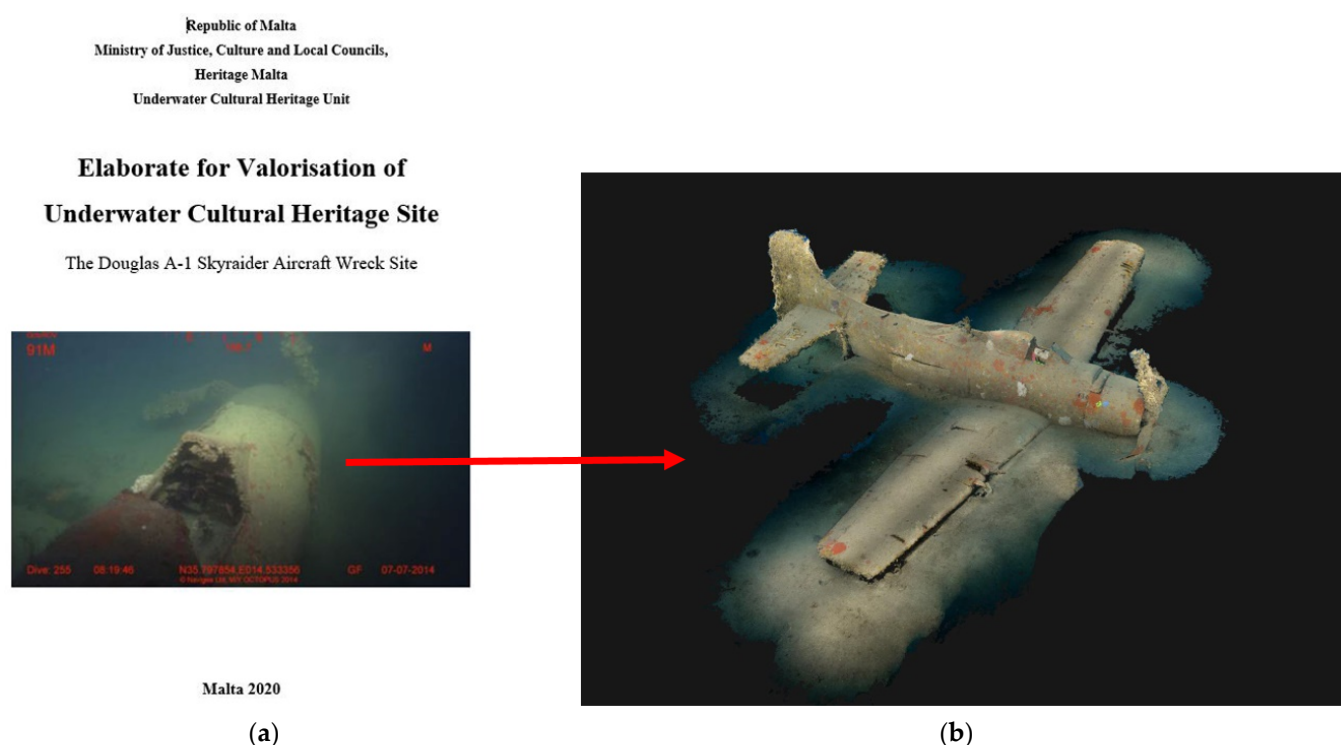


Figure 3. (a) Documentation carried out by the UCHU prior to the opening of a site to the public; (b) the scaled 3D model created as part of the documentation process.

2.2. Identification of Threats

Whilst discovering and identifying sites can be considered a relatively problem-free endeavour, their continued protection and preservation in situ is fraught with challenges. The identification of threats and challenges is an integral part of management strategies, often intertwined with stakeholder interests. The UCHU has identified a number of threats: (1) the fishing industry, (2) diving, and (3) bunkering. In terms of management, it must be kept in mind that UCH does not exist in a vacuum; rather, it exists as part of an interconnected network of activities directly linked to the sea such as fishing, diving, and shipping. Therefore, any management and protection considerations need to be ‘in a manner that takes into account the economic impact of restricting current commerce’ [35] (p. 358). This is where the importance of effective stakeholder relationships is most evident since, for example, without a collaborative relationship with the fisheries department, the UCHU would be unable to run an effective outreach campaign on the impacts of fishing on UCH sites. The relationship between UCHU and dive centres is similar, where without the support of the local diving community, effective management would be impossible. Therefore, whilst specific threats (such as lost and abandoned fishing gear) have been identified, and even persist, mitigation measures are also in place.

2.3. Protection Principles

In order to maintain the authenticity and integrity of wreck sites, the UCHU has chosen to focus on four main principles of protection, namely: (1) respect historic wrecks, (2) respect marine life, (3) do not enter the wrecks, and (4) look but do not touch. These were designed around a system of best practice, mirroring the UNESCO Convention’s Visual Code of Ethics [36]. These are guidelines specific to visiting divers and are intended to raise awareness amongst the diving community on the importance of preserving and protecting historic wreck sites.

In order to ensure that these principles are adhered to, the UCHU has devised a number of monitoring systems. Foremost amongst these are site patrols, which mirror a similar system set up in Sicily through the Soprintendenza del Mare where stakeholders

such as the Carabinieri, Guardia di Finanza, and Guardia Costiera actively participate [26]. In Malta, this type of enforcement is designed to ensure that no unregistered dive centres or vessels are visiting the sites, that any registered divers are not looting, and that prohibited fishing activities are not being carried out. In this context, buffer zones are important because they provide a tangible area of control. The declared zones are marked on marine charts and a Notice to Mariners on the opening of new sites is issued annually (Figure 4).

Heritage Malta
Underwater Cultural Heritage Unit

List of sites:
PORTS AND YACHTING DIRECTORATE
NOTICE TO MARINERS NO 51 of 2019

Wreck	Latitude (N)	Longitude (E)	Buffer Area (Radius)
Off II-Ponta tal-Qawra J188	35° 58' 484	014° 27' 982	250 m
Off II-Bajja ta' Sau Giljan Faincy Swardfish	35° 56' 102	014° 30' 646	250m
Off II-Port il-Kbir (Valletta) HMS Olympus Schelboot HMS Trusty Star	35° 55' 536 35° 54' 289 35° 54' 388	014° 33' 916 014° 32' 861 014° 33' 371	500m 500m 500m
Off II-Bajja ta' Marsaskala ORP Kugawak HMS Southwold (Bow) HMS Southwold (Stern) SS Polynesian (Bow) SS Polynesian (Stern) HMS Nustartian HMS Russell	35° 53' 290 35° 52' 434 35° 52' 349 35° 51' 469 35° 51' 451 35° 53' 637 35° 54' 198	014° 38' 482 014° 35' 826 014° 35' 861 014° 36' 297 014° 36' 292 014° 42' 512 014° 36' 473	500m 500m 500m 500m 500m 500m 500m
Off II-Bajja ta' Marsaskalk SS Lucison	35° 47' 464	014° 35' 464	500m

Archaeological Zones at Sea
The Superintendence of Cultural Heritage is hereby declaring the mentioned sites as included in the list of protected sites, in terms of Articles 3, 7(3) and 43 of the Cultural Heritage Act (Cap. 445).

In view of the above, Transport Malta hereby notifies that with immediate effect:

- All commercial vessels intending on carrying out diving operations on the listed historical wrecks must be fitted with an AIS which must be kept on all the time.
- Besides the necessary permits from Heritage Malta - Underwater Cultural Heritage Unit they must obtain clearance from Valletta Port Control (Valletta VTC) on VHF channel 12 or Marsaskalk Port Control (Marsaskalk VTC) on VHF channel 14, following a pre-notification.
- Compliance with this requirement is mandatory and non-compliance will entail the prohibition of stepping/diving on these sites and/or navigation in general, without prejudice to other applicable penalties and legal proceedings.
- The buffer area is considered as "NO STOPPING AREAS".
- Anchoring/mooring will only be allowed to divers' vessels fitted with an AIS and having a special permit as stated above.
- Masters of diving support vessels are to ensure that the appropriate signals in accordance with the International Convention for the Prevention of Collisions at Sea and the International Code of Signals, are shown at all times.
- Furthermore, divers/masters are to note that spear fishing and the use of fishing gear such as set bottom lines, trammel nets, gill nets and entangling nets, encircling nets, demersal pots and traps are prohibited in these areas.
- Only surface fishing is allowed including trolling lines (traw) and angling for pelagic fish.

(a)

Instructions for dive leaders

- Respect all measures that protect sites
- Do not tie marker buoys or access lines directly to a wreck or relic
- Keep diving groups small
- Follow up and observe the group at any time through the dive
- Be a role model
- Strictly respect the rules of no contact and do not enter the wreck
- Stay safe

Instruction for divers

- Obey legal protection of archaeological sites
- Do not enter the wreck, observe only from the outside
- Look but don't touch
- Avoid touching and disturbing any animals or plants
- Ensure that all diving equipment — such as gauges and regulators — are secured firmly and not dragging
- Be aware of your fins
- Exercise proper buoyancy control
- Avoid contact with the wreck when shooting photographs or filming video
- Stay safe

(b)

Figure 4. (a) The location and rules and regulations of Archaeological Zones at Sea; (b) instruction cards for divers visiting sites.

Similar to Sicily, site patrols are also carried out by a number of stakeholders such as Transport Malta, the Fisheries Department, and the Armed Forces of Malta, and they are a testament to the synergetic relationship between the various stakeholders. To supplement these spot checks, the UCHU has implemented a system of smart patrols. These include the use of a drone to patrol from land and regular checks on marine traffic channels to ensure that no unregistered vessels are stopped, anchored, or moored in the buffer zones' surrounding sites. It is recognised that enforcement underwater is not guaranteed unless a heritage manager accompanies a dive group, but spot checks at departure and arrival points for dive vessels can also be carried out. UCHU personnel regularly carry out checks on social media networks in order to follow up dives. The online booking system outlined below provides the UCHU with a record of registered dives and allows for the coordination of regular social media checks, where images and videos uploaded by visiting divers can be observed for any prohibited behaviour. What must be noted is that it is not possible to 'permanently control all the sites so they have to work in order to make people understand the importance of such heritage, thus becoming themselves guardians of the sites' [26] (p. 95). It is not the intention of the UCHU to over-regulate the diving sector; however, curbing behaviours that have been unregulated for decades does not come without its challenges.

2.4. Smart Public Access Management

The smart public access management implemented by the UCHU is based on the principle of ticketed access to UCH sites. This follows the same principles as purchasing tickets to terrestrial sites, where an online booking system is used by dive centres and clubs to purchase tickets to access Heritage Malta's underwater sites. Prior to the implementation of this system, diving was not regulated, resulting in a situation whereby cultural material could easily be looted, sites could be damaged, and delicate marine flora could be disturbed.

A system of registration for local dive centres, clubs, and dive vessels was introduced. This registration requires the acceptance of terms and conditions that govern access, and it is only those registered that can visit Malta's managed UCH sites. Registration does not only mean the acceptance of the UCHU's principles but also includes other aspects such as a mandatory automatic identification system (AIS) for dive vessels. This is in contrast to Sicily, where a system of guardianship that allows dive centres to dive on specific sites on the condition that they protect the site or objects has been set up. According to Tusa (2009) [26], this system is mutually beneficial, providing 'control of the site free of charge and the diving clubs receive further occasion of earning income' [26] (p. 96).

In Malta, the principles of protection for sites are set out as part of the terms and conditions that must be signed upon ticket purchase, a legal and binding agreement between visitors and managers. When accessing the booking system, registered centres and clubs choose which site is to be visited, indicate which registered dive vessel is to be used, and who the dive leader is. All divers that are participating in the dive, as well as the location and time of departure, must also be listed. In addition, the online ticket system also caters to the booking of manned submersible visits, regulated by the same terms and conditions. Submarines are becoming increasingly popular additions to luxury yachts and cruise-liners, and considering Malta's large cruise liner industry, the UCHU has pre-empted their arrival and introduced services for their use. This is relevant because there are a number of UCH sites situated in waters too deep for divers to visit, and through the regulation of submersible visits, these sites are now accessible. The online booking portal also ensures that the UCHU has a complete record of who, when, and where someone visited (Figure 5). Such data can be used for future comparative data analyses, thus allowing heritage managers to compare aspects such as visitor numbers, peak seasons, and preferred sites.

The screenshot shows a 'Bookings' window. At the top, there is a 'Ticket Book' section with a dropdown menu for 'Site' set to 'HMS Russell 110m (Off Grand Harbour)'. Below this is a calendar for 'October 2019' with the date '2' highlighted. To the right is a 'Divers' table with columns for 'Member Name' and 'Surname'. Below the calendar and table are buttons for 'Cancel', 'Remove Diver', and 'Add Diver'. At the bottom, there are fields for 'Boat' (set to 'Dive'), 'Dive Leader' (set to 'Dive Captain'), 'Departure from', and 'Departure time' (with '(approximate)' text). On the right side, there are labels for 'Credit' (€ 75.00), 'No. Divers' (0), and 'Ticket Price' (€ 0.00).

(a)

The screenshot shows a 'SUBMERSIBLES' window titled 'New Submersible Booking'. It features a dropdown for 'MSO', a 'Site' dropdown, and a calendar for 'May 2021' with the date '10' highlighted. To the right is a 'Passengers' table with columns for 'Name' and 'Surname'. Below the calendar and table are buttons for 'Clear', 'Remove Passenger', and 'Add Passenger'. At the bottom, there are fields for 'Vessel', 'Sub Type', and 'Pilot'. On the right side, there are labels for 'No. Passengers' (0), 'Departure from', 'Departure time' (with '(approximate)' text), 'Credit' (0.00), and 'Ticket Price' (0.00), along with an 'Add' button.

(b)

Figure 5. (a) Ticketing system for visiting divers and (b) manned submersible ticketing portal.

In order to incentivise local divers, a Heritage Malta Shipwreck Club was created. For an annual fee and registration, divers can visit any of Heritage Malta's underwater sites and benefit from a number of other offers. This initiative specifically targets local divers, and only individuals with a postal address in Malta or Gozo who are part of a local dive club can register. However, Historic Shipwreck Club members are still required to book through the online system and are obliged to use a registered dive vessel, ensuring that a record of visitation is maintained. Dive clubs, in particular, have benefitted from the Shipwreck Club, since technical diving is not limited to the summer months—it is an almost year-round activity. The funds gathered from these memberships are an important source of income for conservation works and projects.

2.5. UCHU Initiatives

In addition to the regulation of access to underwater sites, the UCHU also has a number of other projects that are carried out throughout the year. These initiatives are always in collaboration with other stakeholders, such as the University of Malta and the Superintendence of Cultural Heritage, as well as local dive clubs. A prime example is the launch of an ongoing large-scale net removal project. The synergy between stakeholders becomes integral here, since it is visiting divers who inform the UCHU on the presence of abandoned or lost fishing lines and nets and who also participate in its removal. To date, three sites have been cleared of fishing gear, and more are scheduled for the coming months (Figure 6). Other projects include the filming of underwater sites for the creation of 360 videos, continued 3D documentation of sites, and remote sensing surveys.



Figure 6. The removal of fishing gear from the wreck site of the HMS Nasturtium. © Heritage Malta 2021.

3. Marketing and Promotion

UCH is often described as being 'out of sight, out of mind', leading to a general lack of awareness amongst the wider public. A main reason for this is that these objects and sites are often 'less quantified, studied and catalogued than terrestrial heritage; and law enforcement and monitoring of sites is more challenging in the underwater environment' [37]

(p. 3). This general unawareness has resulted in marketing and promotion forming part of the core responsibilities of the UCHU based on the premise that the higher the level of awareness, the more protection sites are accorded. The promotion of value amongst groups such as school children, visiting divers, or heritage tourists and the wider community is integral, since 'education is the fundamental tool to increase the level of respect of our heritage' [26] (p. 95). In order to promote the value of historic wreck sites, the UCHU is in the process of implementing a long-term project aimed at providing dry dive experiences. The use of equipment such as an underwater 360 camera, as well as powerful underwater lights and mirrorless cameras, has enabled the use of virtual reality (VR) equipment as a tool of knowledge dissemination (Figure 7). The methodology behind the data capture and processing of 3D models and their wider public outreach potential were explored by Gambin et al. 2021 [34]. Such initiatives are currently aimed school children and are incorporated into a larger event that includes an informative lecture and the use of VR goggles to dive into history. Similar events aimed at the wider community have also been planned, but the ongoing COVID-19 pandemic has side-lined many of these activities.

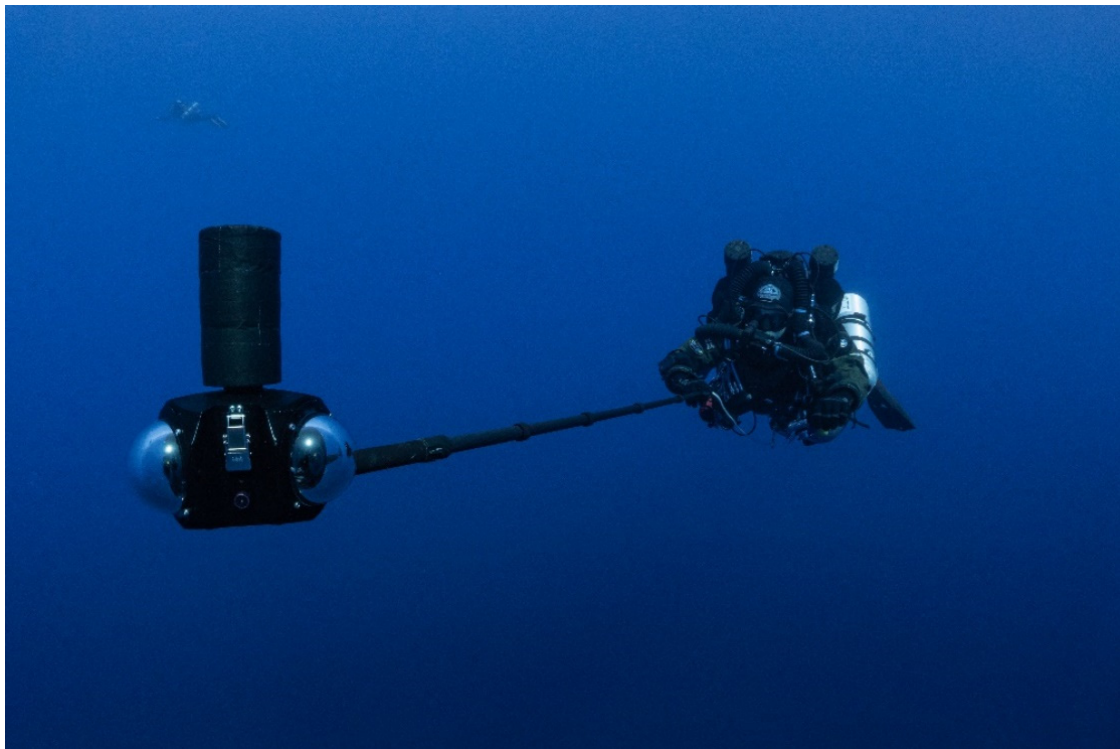


Figure 7. An underwater 360 camera being used to film educational material. © Kristof Goovaerts/University of Malta 2020.

Apart from this outreach campaign, the UCHU has also implemented an initiative to promote Malta as a haven for deep-water technical diving. The advantage that Malta has over other destinations is the sheer concentration of deep-water sites in close proximity to each other and the coast, which is unparalleled in the Mediterranean. This deep-water technical diving promotion is achieved through a number of channels. International fairs such as the European Dive Show (EUDI) and the World Travel Market provide large arenas for Malta to showcase its potential. In addition to international fairs, popular dive and cultural magazines are integral to showcasing the island's sites and initiatives. Using these outlets have proven to be a successful and popular method of raising awareness, and, consequently, the UCHU aims to publish a number of popular articles on an annual basis. Relevant publications include *Military History Matters*, *HISTORYNET*, *DIVER Magazine*, and *Current World Archaeology*, as well as foreign publications such as the French *Plongez Magazine* and the German *TAUCHEN Magazine*. In order to remain visible within the diving community, local and international news outlets are also regularly used to supplement

specific events, initiatives, and announcements. A prime example of this is the net removal project on Malta's historic wreck sites, which was reported on in national and international news (Figure 8).

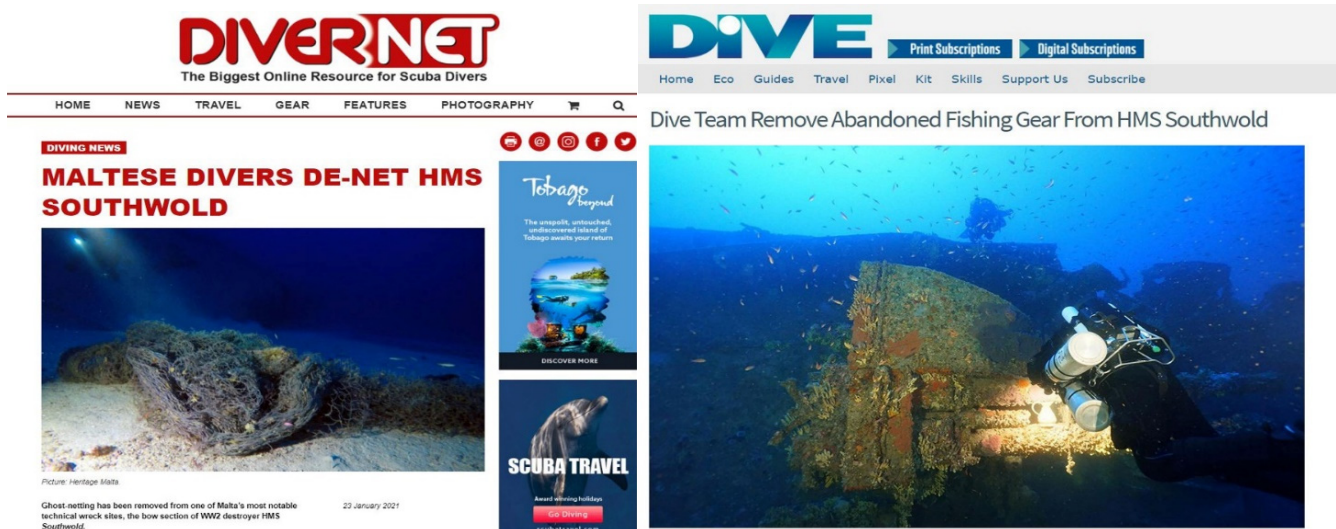


Figure 8. Examples of international dive websites reporting on the net removal project initiated by the UCHU.

Social media channels such as Facebook and Instagram are used on an everyday basis to communicate new initiatives, events, and news. These have been chosen as the main avenues of communication with the public since the internet can be defined as ‘the most direct and effective means archaeologists, managers, and educators have in reaching the public’ [38]. The UCHU’s Facebook and Instagram following are a result of organic growth, and the high number of interactions that specific posts elicit are a testament to the success of such virtual strategies. The recently launched virtual museum Underwater Malta is another prime tool utilised by the UCHU to promote UCH in Malta and to provide access to sites without getting wet. This virtual platform is a joint initiative by Heritage Malta, the University of Malta, and the Malta Tourism Authority. Gambin et al. 2021 [34] presented the workflow behind the virtual museum, focusing on the digital public outreach strategy implemented in Malta, namely the 3D recording of sites. The data capture and processing methods are presented within the context of recording deep-water sites. The resulting 3D models are of scientific value in terms of providing baseline data whilst simultaneously allowing for the curation of an entirely digital experience that allows visitors to dry dive into history. The platform seeks to integrate tourism promotion with public outreach, creating a unique website where anyone can dive into history. Multiple underwater sites can be explored as 3D reconstructions or through VR, photographs, videos, and informative text panels that provide historical context and site specifics (Figure 9) [34]. Facebook and Instagram are used to promote access to Underwater Malta, and similar to the UCHU pages, this is achieved through organic growth. It can be noted that social media posts can be directly linked to spikes in visitor numbers, a correlation that is also applicable to popular magazine and newspaper publications. Since the launch of Underwater Malta in June 2020, the virtual museum has received just over 40,000 virtual visitors from across the world, verifying the potential of such websites to raise awareness. In the coming months, more wrecks are to be added, increasing the number of virtually available sites.

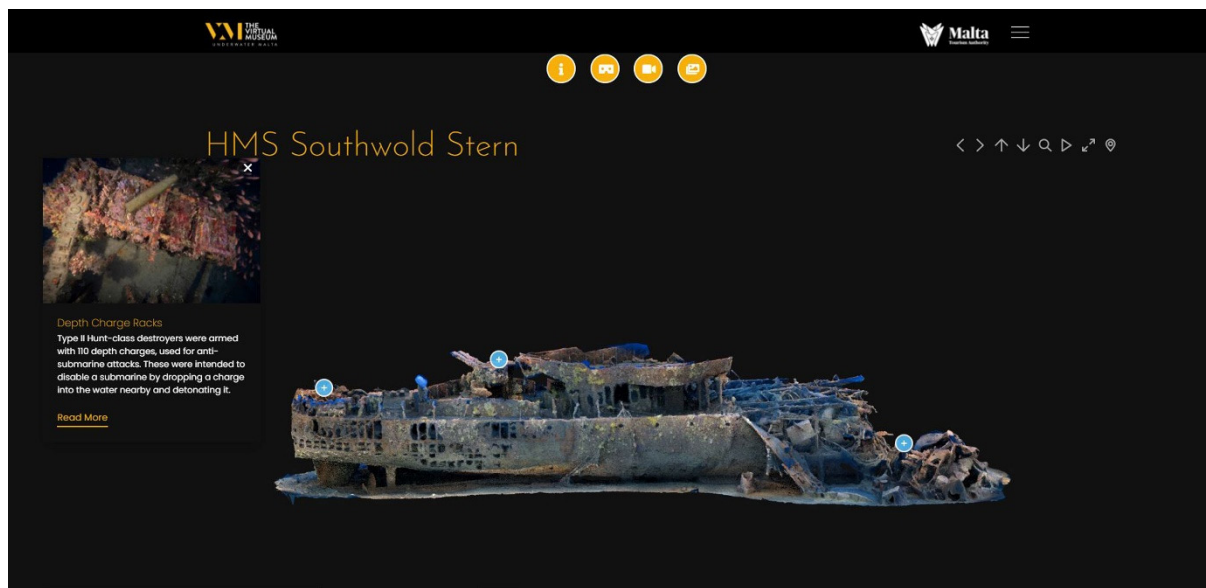


Figure 9. The landing page of a site on the Underwater Malta platform. The 3D model is annotated with features specific to the wreck, which in this case, are highlighting the depth charge racks located on the stern of the HMS Southwold.

4. UCHU Sites

Currently, there are 16 sites under the protection and management of the UCHU, consisting of nine historic shipwrecks and six aircraft wreck sites (Figure 10). These sites are a testament to Malta's role in the First and Second World War, as well as its Cold War legacy. A consistent characteristic of these sites is their depth, as all are located below the 50 metre contour line. The sites are also characterised by the presence of war graves, unexploded ordinances, and protected marine life. The majority of historic wreck sites open to the public date to the First and Second World Wars, and some of these are also war graves. The presence of a war grave does not necessitate a blanket ban on diving, but it does mean that UCHU's protection principles must be strictly adhered to. Moreover, whilst these wreck sites are located in Malta's territorial waters, sovereign immunity is applicable, and when sites from recent conflicts are discovered, an effort is made to identify the ship or aircraft. This is somewhat simpler with larger targets such as ships and submarines because such sites are more 'recognizable' due to features that are particular to ship or aircraft type. In certain cases, the presence of the name of the vessel may also be recognized. Moreover, the loss of large craft close to the island would have been reported and thus already on record. Part of the research carried out by the UCHU is aimed at ascertaining whether any personnel perished in the sinking. With aircraft, this exercise is somewhat more problematic—even for sites that are very well-preserved. This is because multiple examples of single types of aircraft were lost off Malta and Gozo, and unless identification plates are located and cleaned to reveal the plane's serial number, one can only narrow down the identification to several similar aircraft lost in that area [39]. In some cases, due to the 'rarity' of an aircraft, it is possible to identify the exact crash incident. In the latter cases, as with ships and submarines, embassies of those who lost their lives are notified, as outlined in Article 7 of the UNESCO Convention. Although no specific legislation regulates the declaration and management of war graves at sea, Maltese authorities treat all sites where lives have been lost as war graves. Information denoting loss of life is clearly listed on the UCHU website and on the Virtual Museum—Underwater Malta. Levels of caution also apply to natural heritage, with sunken remains acting as artificial reefs that attract a variety of marine life. In fact, a number of the UCHU's sites are covered in protected corals and sponges that are of interest to the marine sciences. An example of this is the presence of sponges sampled from a number of Heritage Malta sites in July 2021 (Figure 11).

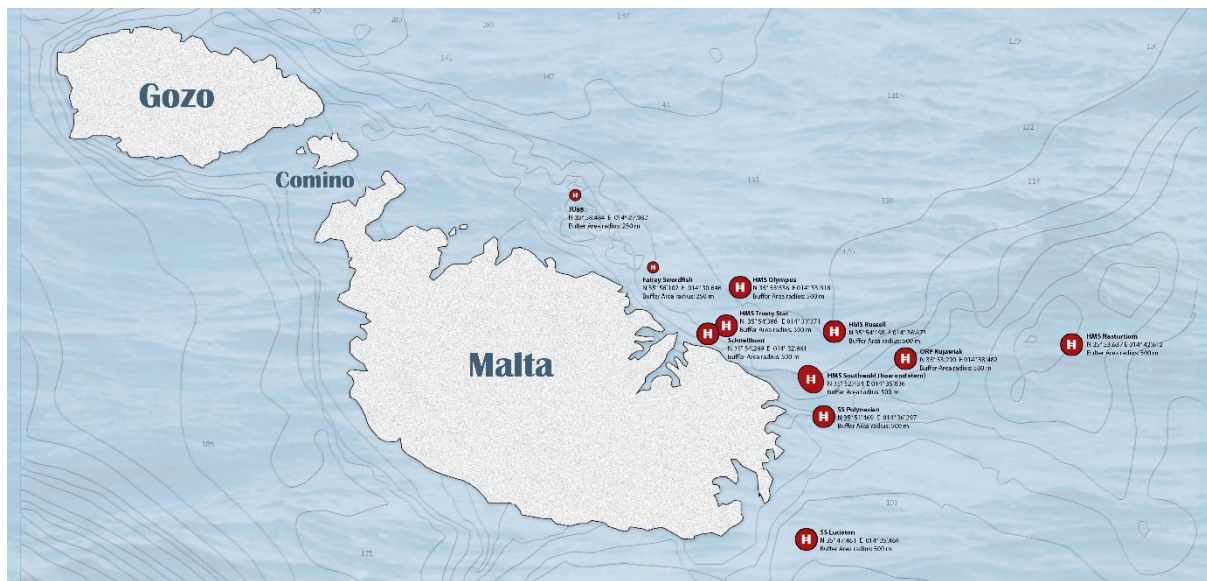


Figure 10. Overview of sites managed by the UCHU in 2019. The proximity to the coast and other wrecks is an advantage for Malta.



Figure 11. Diver sampling sponges on the SS Polynesian, a historic shipwreck managed by the UCHU. © Heritage Malta 2021.

5. Conclusions

This article has traced the development of underwater cultural heritage management in Malta and presented the current and active innovative public access system. The UCHU has sought to implement a system that mirrors practices for terrestrial sites based on the principle that underwater sites should be accorded the same levels of access and protection as those located on land. The online booking system set up by the UCHU is a user-friendly interface that allows visiting divers to book tickets to specific underwater sites. The system of smart patrols has created a framework within which the illicit recovery of material is being mitigated through actions such as regular spot checks at dive sites and points of departure. The aim is not to curb diver behaviour but rather to instil a sense of awareness amongst the diving community on the value of these underwater sites. It is only with such

an awareness that the continued integrity and authenticity of wreck sites can be guaranteed. Interest amongst the non-diving public is also of importance, with outreach campaigns aimed at all sectors of society including school children. The importance of instilling a sense of awareness from a young age cannot be understated, and in the coming months, the UCHU will be testing the use of VR headsets and 360 videos as outreach tools with the ultimate aim of integrating these digital technologies into the school curriculum in tandem with short informative lectures. The coming months will also see the launch of a number of new sites on the virtual museum platform, as well as the opening of new sites to the diving public in early 2022, continuing the UCHU's aim to annually open sites. The setting up of the UCHU and its functions ensured that the necessary infrastructure needed to sign and ratify the UNESCO Convention is in place, and in April 2021, Malta officially announced its ratification, joining an international network of nation-states committed to the protection and valorisation of underwater cultural heritage.

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