Department of the Environment, Heritage and Climate Change
HM Government of Gibraltar

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Gibraltar Marine Reserve

Gibraltar Marine Reserve Management Plan

Contents

1. Introduction:

Ever since the Southern Waters of Gibraltar were designated as a marine Natura 2000 site in 2006, Her Majesty's Government of Gibraltar (HMGoG) has continuously been taking steps to safeguard the protection of marine species and habitats found within British Gibraltar Territorial Waters (BGTW). The publication of the Marine Protection Regulations in 2014 were instrumental in bolstering the already existing protection regime reliant on the Nature Protection Act 1991 and the Southern Waters of Gibraltar Special Area of Conservation (SAC)/Special Protected Area (SPA) Management Scheme 2012. More recently, the extent of the marine protected area was legally extended to include all of BGTW by means of the Nature Protection (Designation of Marine Nature Area) Order 2014. This came into operation in January 2015.

The Gibraltar Marine Reserve Management Plan now provides the framework to extend the protection of habitats and species outside the Southern Waters SAC/SPA to include the entirety of BGTW; a milestone achievement in marine conservation planning. The high-level conservation objectives which previously applied to the Southern Waters now apply to BGTW overall. These are succinctly summarised as being:

'Ensuring that the status of all European and locally protected features achieve or maintain favourable conservation status allowing for natural change'

More specific *Conservation Objectives* for the Southern Waters SAC/SPA and BGTW have been developed for protected habitats and species as part of the plan to ensure that tangible progress is made in safeguarding their protection. The Southern Waters SAC/SPA Conservation Objectives[1] should therefore be read in conjunction with the Gibraltar Marine Reserve Management Plan which also contains *Indicators* used to monitor progress towards achieving or maintaining *Favourable Conservation Status*. These indicators build on the already existing metrics and programme of measures developed to ensure compliance with the Water Framework and Marine Strategy Framework Directives. HMGoG is also seeking the extension of the Barcelona Convention for the Protection of the Mediterranean Sea and increased involvement in UNEP's Mediterranean Action Plan. This will help ensure that Gibraltar's ongoing marine monitoring and management programme is consistent and comparable with regional efforts to improve the marine environment.

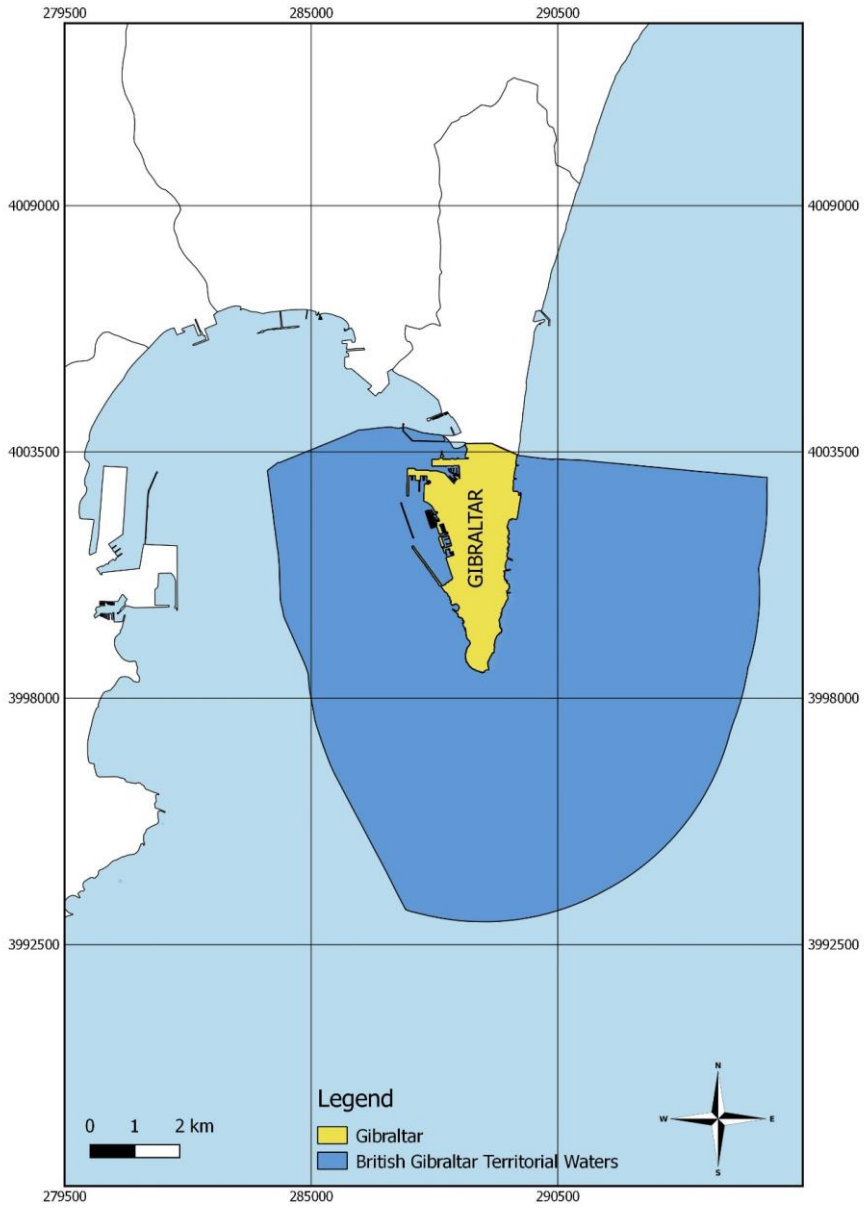
Both the Gibraltar Marine Management Plan and Southern Waters of Gibraltar SAC/SPA Conservation Objectives are living documents that will be updated periodically by the Department of the Environment, Heritage and Climate Change in response to changing threats and pressures in Gibraltar's marine environment.

[1] https://www.gibraltar.gov.gi/new/sites/default/files/HMGoG_Documents/SWoG%20Conservation%20Objectives_FINAL_23.1.18.pdf

2. British Gibraltar Territorial Waters:

British Gibraltar Territorial Waters (BGTW) extends three nautical miles (nm) to the south, east and southwest being landlocked to the north. They have long been recognized as an important marine area due to its rich diversity in species and habitat. Sea cliffs, caves, reefs and sandy marine habitats all form part of the marine ecosystems found within BGTW. The abundance and richness of species is largely influenced by the strong currents and upwelling's that are so characteristic of the Straits of Gibraltar. The Gibraltar Marine Reserve is dominated by a highly active hydrodynamic regime. Cooler Atlantic waters meet those of the warmer Mediterranean, with the exchange taking place through the narrow Straits of Gibraltar. The Atlantic waters enrich those of the Mediterranean, providing key nutrients and fuelling marine productivity.

Figure 1. British Gibraltar Territorial Waters and the Bay of Gibraltar.



The Bay of Gibraltar has become a prominent industrial and maritime hub resulting in a myriad of anthropogenic activities taking place. In addition, two main rivers empty into the Bay namely the rivers Palmones and Guadarranque which are themselves impacted by industrial and agricultural activity further upstream. It should be noted that the Bay of Gibraltar is divided by a median line distinguishing BGTW from Spanish waters. A significant amount of research has been carried out on the impacts of marine pollution on the North section of the Bay which is where the heavy industrial installations are located. The latter include petrochemical installations such as a major oil refinery, a stainless steel manufacturing plant, paper mills and ironworks.

3. The Southern Waters of Gibraltar:

The Southern Waters of Gibraltar were approved as a Site of Community Importance (SCI) in July 2006 following Commission Decision 2006/613/EC. A protection regime has been in existence since 1991 through the Nature Protection Act 1991. Following its approval as an SCI, H.M. Government of Gibraltar declared the Southern Waters of Gibraltar as a dual Special Area of Conservation (SAC) and Special Protected Area (SPA) through the following legislative instruments:

- Designation of Special Area of Conservation (Southern Waters of Gibraltar) Order 2012
- Designation of Special Protected Areas Order 2011

The Southern Waters SAC/SPA extends three miles to the East and South of Gibraltar and stretches all the way up to the median line to the West of Gibraltar. Due to the strategic location between the Mediterranean Sea and the Atlantic Ocean, large migratory movements take place through the Southern Waters SAC/SPA, resulting in the presence of a multitude of pelagic and predatory fish along with cetaceans particularly Striped and Common Dolphins. The latter species breed in the Bay of Gibraltar.

The Southern Waters SAC/SPA is also located in an important migration route for seabirds. Many species stop and feed within the marine SAC/SPA during their migratory journeys and some, such as Scopoli's and Balearic Shearwaters, regularly forage in the marine SAC/SPA. Other species rely on the SAC/SPA during the winter whereas whereas some species, such as the Mediterranean Shag are found in the reserve all year round.

Scopoli's Shearwaters in the Southern Waters ©Nicholas Ferrary.

Figure 2. Protected area network in Gibraltar including the Southern Waters SAC/SPA.

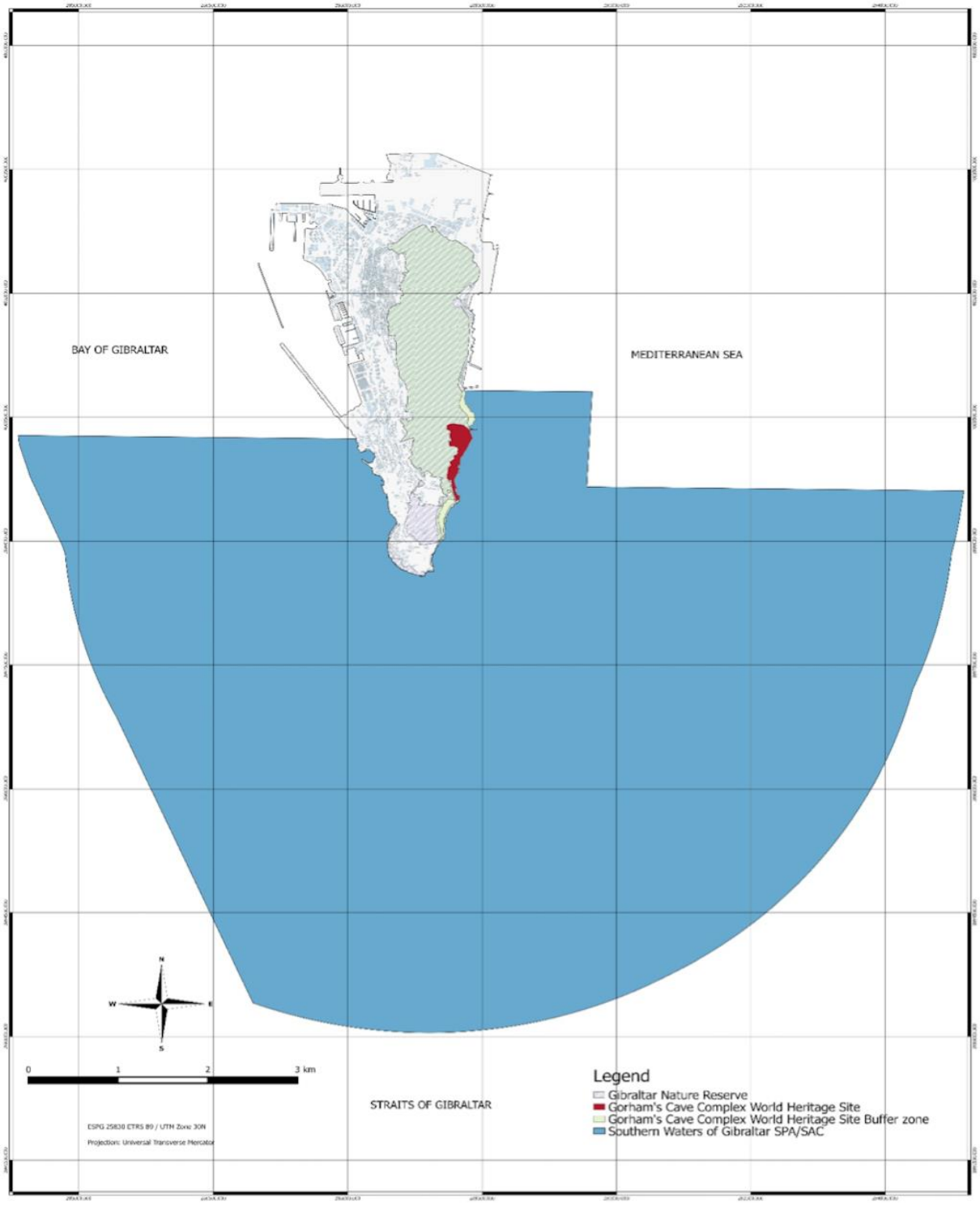
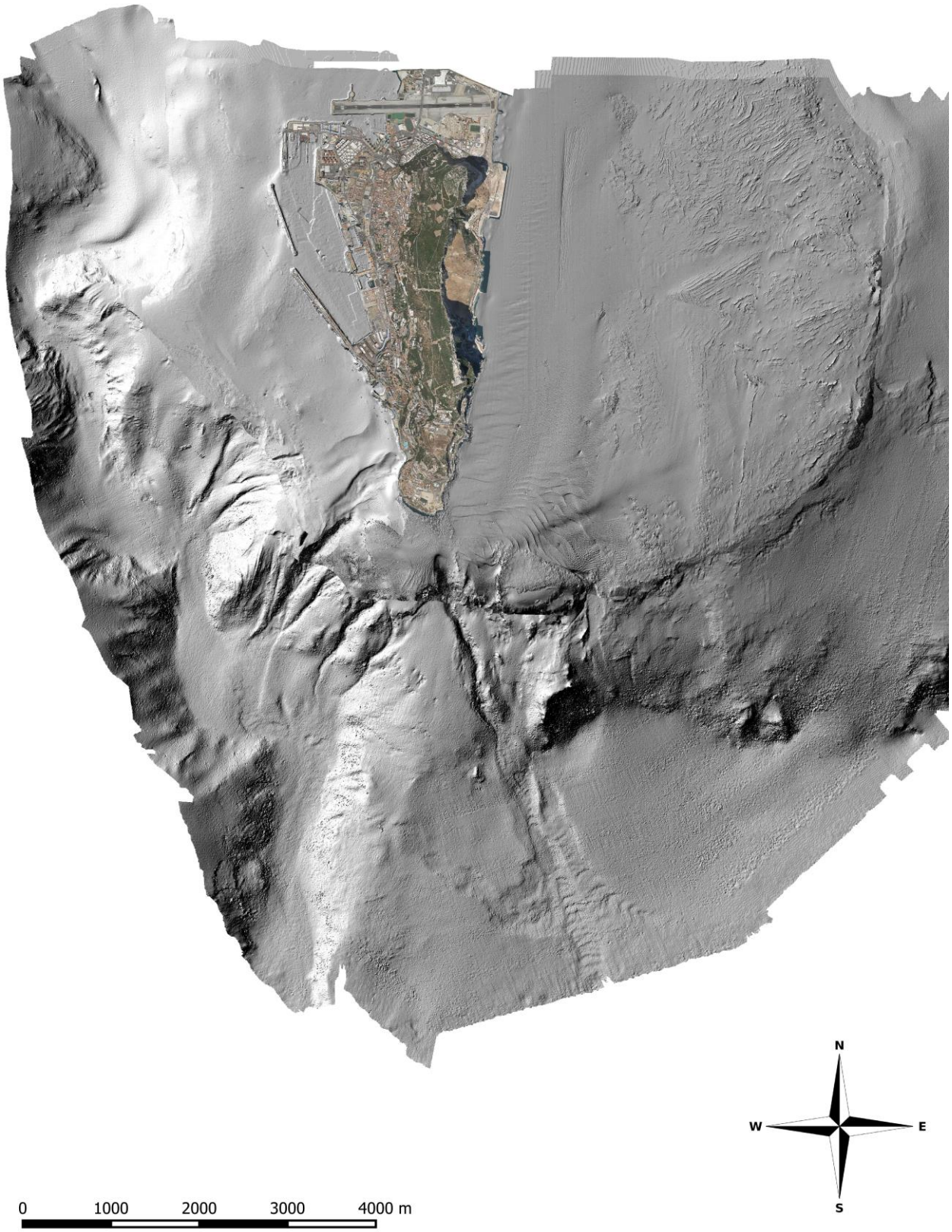


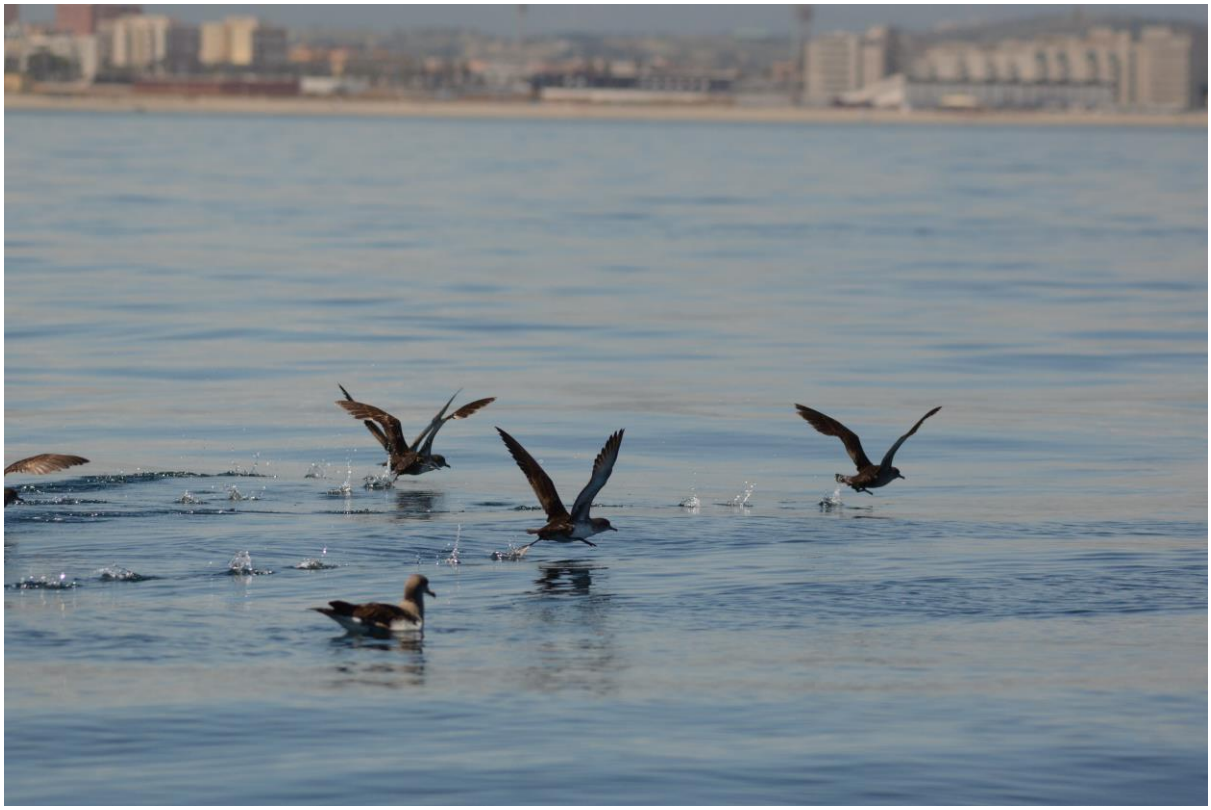
Figure 3. High-resolution bathymetry of BGTW.



4. Eastern Shelf:

The eastern shoreline of Gibraltar is made up of a combination of steep vertical sea cliffs, rocky shoreline and sandy beaches. Both shallow and deep-water coraligenous reefs are found in the eastern shelf although the benthic environment is principally comprised of sandy habitat. Rocky outcrops found offshore (30m+) include Weaver's Pinnacle and Peter Ives' Pinnacles. These outcrops host Grouper, Spider crab, Conger and Moray eels amongst a range of other indicator species. The eastern shelf also forms part of the migratory route for many seabirds and cetaceans including Fin Whales which are regularly seen on passage particularly in Spring.

Left: South-eastern coastline of Gibraltar with partially submerged sea caves ©Mark Galliano. **Right**: Fin Whale migrating through the eastside en-route to the Atlantic Ocean ©Sera Fromow. **Below**: Balearic Shearwaters rafting on the eastside © EPRU/DEHCC.



5. Legal instruments overview:

(a) Nature Protection Act 1991

The Nature Protection Act (NPA) 1991 gives effect to both the Habitats and Birds Directives in Gibraltar and its territorial waters transposing all the obligations required therein.

These two Directives have complimentary over-arching aims to maintain and improve the status of natural habitats and species. Such measures are clearly contributory to achieving and maintaining Good Ecological Status. The focus of the Directives is as follows:

- The Habitats Directive: The Directive promotes the maintenance of biodiversity by requiring Member States to take measures to maintain or restore natural habitats and wild species listed on the Directive's Annexes at a favourable conservation status. Robust protection measures are required for those habitats and species of European importance. Member states are required to take account of economic, social and cultural requirements, as well as local and regional characteristics.
- The Birds Directive: The Directive provides a framework for the conservation and management of, and human interactions with, wild birds in Europe, setting broad objectives for a wide range of activities.

Under both Directives, an interconnecting network of designated sites are created, known as Natura 2000 sites. To help achieve these aims, both the Southern Waters of Gibraltar together with the Rock of Gibraltar were designated as a dual SAC/SPA.

The NPA 1991 goes well beyond the requirements of the Directives by extending the protection afforded to species not listed in the Directives. By way of example, the NPA 1991 provides for the near complete protection of all species of sharks, rays and skates in BGTW.

(b) Marine Protection Regulations 2014

The Marine Protection Regulations 2014 build on the provisions of the Nature Protection Act 1991 and provide additional legislative requirements such as licensing fishing, scuba diving, cetacean tour and sports fishing operators within the entirety of British Gibraltar Territorial Waters. Some of the more significant conservation measures incorporated into the legislation so far include:

- Cetacean Protocol;
- No anchoring zones;
- Designation of Marine Conservation Zones including Micro-Marine Reserves;
- Designation of No fishing Zones.

The Regulations allow for the application of additional conservation measures that may be applied to regulate specific activities. In the case of recreational and sports fishing, these include the ability to implement designated fishing seasons and total allowable catches. Simlar legal provisions have also been created under the Tuna Preservation Regulations 2014.

In line with the Government's spirit of cooperation and continued consultation, the Marine Protection Regulations 2014 also provided for the creation of a statutory Fishing Working Group chaired by the Minister for the Environment. This Working Group, serves as a platform to discuss relevant issues such as sustainable fishing activities in BGTW.

(c) Marine Strategy Regulations 2011 & Public Health (Water Framework) rules 2004

The requirements of both the Water Framework Directive (2000/60/EC) and the Marine Strategy Framework Directive (2008/56/EC), are implemented throughout the entirety of British Gibraltar Territorial Waters. These Directives are transposed locally through the Public Health (Water Framework) Rules 2004 and the Marine Strategy Regulations 2011. In keeping with the requirements of the Water Framework and Marine Strategy Framework Directive, the Department of the Environment, Hertitage and Climate Change (DEHCC) has published a River Basin District Management Plan[2] and developed a comprehesive Marine Monitoring Programme[3] including a Programme of Measures for BGTW[4] with the aim of achieving *Good Environmental Status* by 2020. The Gibraltar Marine Reserve Management Plan complements these extisting plans and includes new conservation measures and *Indicators* that will be used to measure progress towards attaining or maintaing *Good Environmental Status* in BGTW.

(d) Dolphin Protection Zone Regulations 2018

These Regulations provide for the designation of a Dolphin Protection Zone in the north eastern limits of BGTW; a known calving location for dolphin species in the Bay. The Regulations introduce strict conditions on recreational and sports fishing fishing by creating an exclusion zone for a specific fishing method using rod and line known as popping.

(e) International Conventions

HMGoG is committed to upholding all the applicable international and regional conventions to further safeguard the environment in the Gibraltar Marine Reserve including, but not limited, to:

- Bonn Convention to conserve migratory species of wild animals (82/461/EEC);
- Rio de Janeiro Convention of Biological Diversity (Biodiversity Convention);
- Bern Convention on the conservation of European wildlife and natural habitats (82/72/EEC);
- Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic area (ACCOBAMS);
- Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean;
- International Commission for the Conservation of Atlantic Tunas (ICCAT) is an inter-governmental fishery organization responsible for the conservation of tunas and tuna-like species in the Atlantic Ocean and its adjacent seas.

[2] https://www.gibraltar.gov.gi/new/sites/default/files/HMGoG_Documents/Gibraltar_River_Basin_Management_Plan_Public_Consultation_Main_Report.pdf

[3] https://www.gibraltar.gov.gi/new/sites/default/files/HMGoG_Documents/MSFD_Marine_Monitoring_Programme.pdf

[4] https://www.gibraltar.gov.gi/new/sites/default/files/HMGoG_Documents/MSFD_PoMS_HMGoG.pdf

6. Plans and Projects:

Any proposed plan or project which is likely to have an effect on the Gibraltar Marine Reserve, either alone or in combination with other plans or projects, would need to be assessed by the Ministry for the Environment in keeping with the legal requirements of the NPA 1991. Any activity or proposal requiring a license, permission, consent or authorization from a competent authority would qualify as a 'plan or project'. Examples of these include:

- Port extension;
- Artificial reefs;
- Dredging proposals;
- Creation of marinas;
- Laying of utility cables/pipes;
- Military activities.

The DEHCC is a statutory consultee of the Development and Planning Commission and receives all planning schemes for any development or works within Gibraltar and its territorial waters. This section briefly outlines the procedure required when dealing with any specific plans or projects.

1. The DEHCC undertakes an initial review or Screening on the 'likelihood of a significant effect' occurring on the Gibraltar Marine Reserve in consultation with the Nature Conservancy Council (NCC) whilst considering other plans, projects and activities and possible cumulative effects. The screening assessment focuses on the conservation objectives of each qualifying feature, as noted within the citation for the site, and the maintenance of site integrity.

2. If a significant effect is likely to occur, then an 'Appropriate Assessment' must be undertaken to establish whether or not the plan or project will have a significant impact on the integrity of the site before further decisions are made. This will be carried out by the DEHCC with the proponent or developer supplying any information required to produce the required assessment. The NCC is consulted throughout the process as statutory advisers to the Ministry for the Environment on all nature conservation issues. Public consultation also occurs with applications submitted to the Development and Planning Commission.

The scope and content of an Appropriate Assessment will depend on the location, size and likelihood of negative impacts on a protected habitat and/or species. In some instances, the Town Planning (Environmental Impact Assessment) Regulations 2000, may be sufficient to assess impacts on ecology. In other cases, more comprehensive ecological assessments may be needed.

The Appropriate Assessment process will determine whether or not a specific plan or project can go ahead. If it can be ascertained that there will be no adverse impact, then the plan or project can proceed provided it is also approved by the DPC in addition to the Ministry for the Environment. However, if the Appropriate Assessment indicates a potential adverse effect, alternative solutions would have to be considered which remove or reduce the possibility of damage to protected species and/or habitats. A plan or project with a negative impact may only be allowed when it is a case of overriding public interest, as determined by the Ministry for the Environment, in which case compensatory measures would be necessary.

7. Gibraltar Marine Reserve – Zonation:

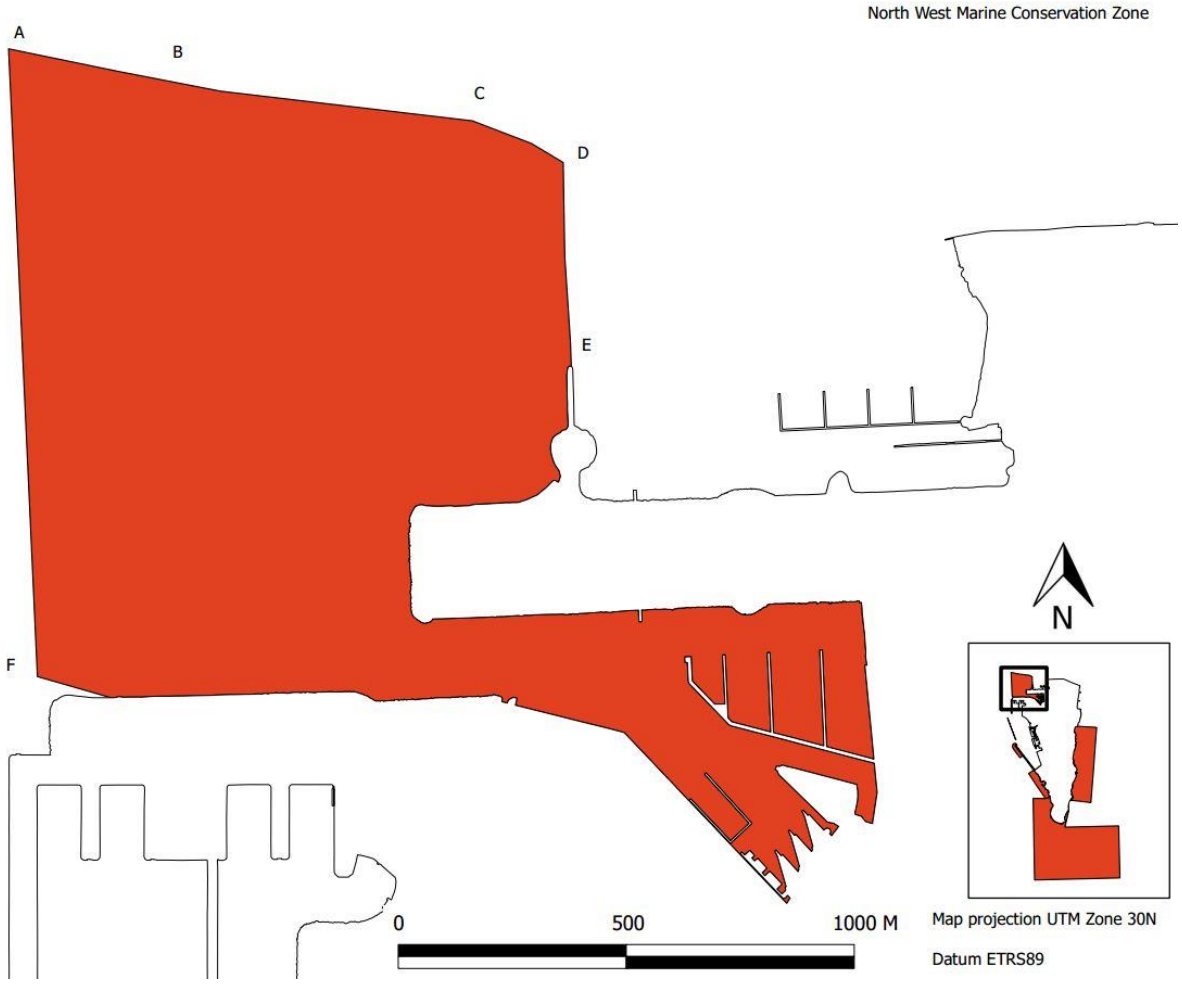
Different classifications of marine protected area exist within the Gibraltar Marine Reserve. In addition to the Southern Waters of Gibraltar SAC/SPA, the following Marine Conservation Zones (MCZs) were designated by means of the Marine Protection Regulations 2014:

North West MCZ
South Mole MCZ
Rosia MCZ
Southern MCZ
Eastern MCZs
Mid-harbour MCZ

The MCZs also include areas where important habitats or species are located and some overlap the Southern Waters of Gibrlatar SAC/SPA. Different conservation measures are in place within the different MCZs including no fishing/no take zones. The Regulations allow for additional controls in the MCZs in response to any emergent threats to biodiversity.

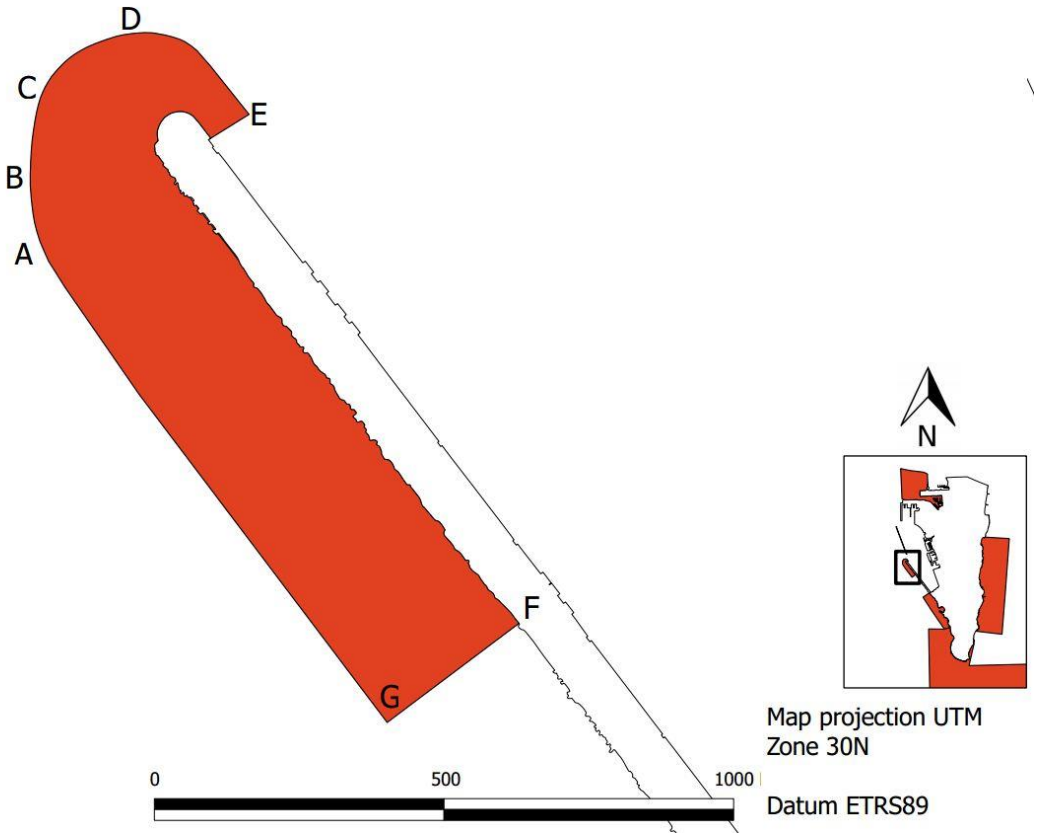
Figure 4. Network of MCZs within the Gibraltar Marine Reserve.

Figure 5. North West MCZ.



Point	Latitude Decimal	Longitude Decimal	Latitude Degrees Min sec	Longitude Degrees Min sec	UTM X	UTM Y
A	-5.365969	36.157101	-05º21'57"	36º09'26"	287166.258	4003967.823
B	-5.362864	36.156594	-05º21'46"	36º09'24"	287444.351	4003904.398
C	-5.359027	36.156233	-05º21'32"	36º09'22"	287788.309	4003855.610
D	-5.357649	36.1557	-05º21'28"	36º09'21"	287910.889	4003793.405
E	-5.357521	36.153234	-05º21'27"	36º09'12"	287915.768	4003519.581
F	-5.365545	36.14947	-05º21'56"	36º08'58"	287183.639	4003119.517

Figure 6. South Mole MCZ.



Point	Latitude Decimal	Longitude Decimal	Latitude Degrees Min sec	Longitude Degrees Min sec	UTM X	UTM Y
A	-5.365257	36.133024	-05º21'55"	36º07'59"	287165.038	4001294.225
B	-5.365401	36.13351	-05º21'55"	36º08'01"	287153.451	4001348.502
C	-5.365284	36.134139	-05º21'55"	36º08'03"	287165.648	4001418.025
D	-5.364577	36.134521	-05º21'52"	36º08'04"	287230.293	4001458.885
E	-5.363585	36.133986	-05º21'49"	36º08'02"	287318.112	4001397.290
F	-5.361349	36.130578	-05º21'41"	36º07'50"	287510.216	4001014.302
G	-5.36244	36.129924	-05º21'45"	36º07'48"	287410.200	4000944.169

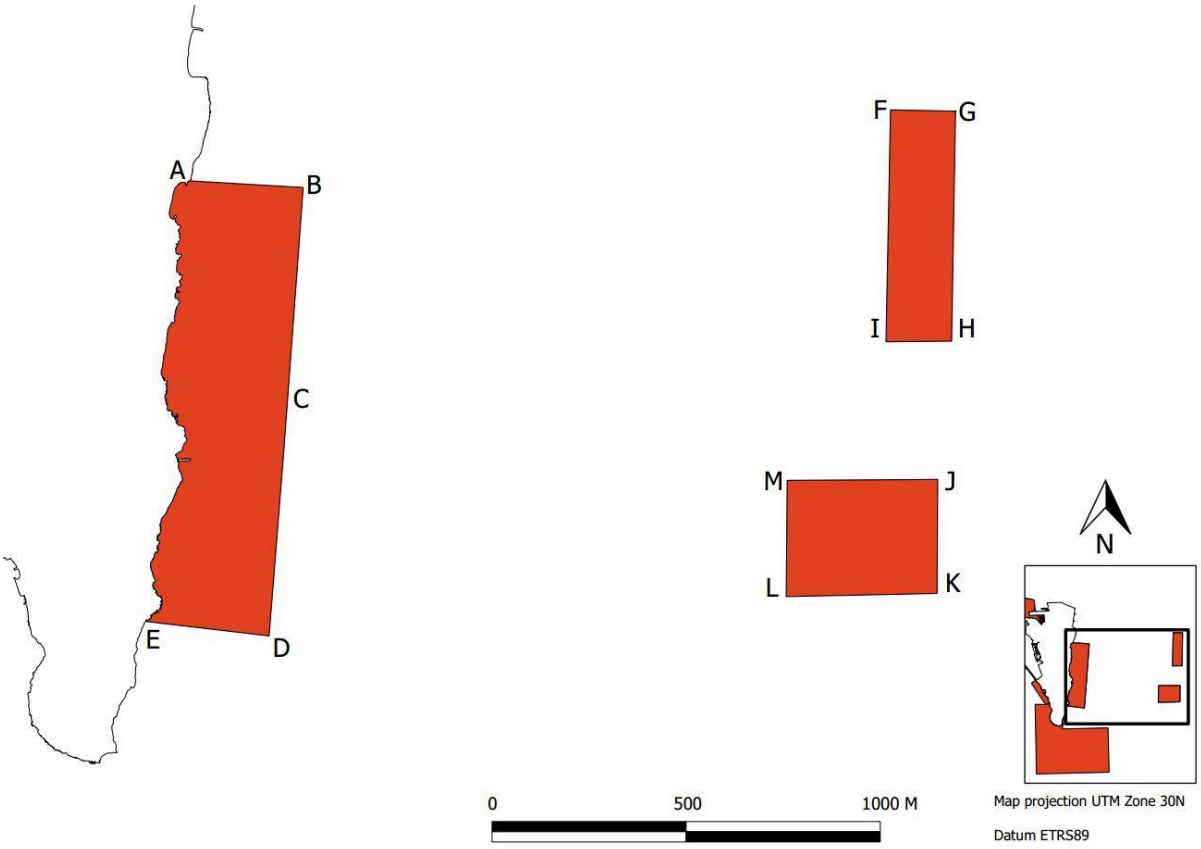
Figure 7. Rosia MCZ.

Point	Latitude Decimal	Longitude Decimal	Latitude Degrees Min sec	Longitude Degrees Min sec	UTM X	UTM Y
A	-5.35919	36.129988	-05º21'33"	36º07'48"	287702.929	4000383.714
B	-5.357005	36.126051	-05º21'25"	36º07'34"	287888.935	4000502.635
C	-5.350764	36.117385	-05º21'03"	36º07'03"	288427.435	3999527.479
D	-5.352418	36.116967	-05º21'09"	36º07'01"	288277.411	3999484.789

Figure 8. Southern MCZ.

Point	Latitude Decimal	Longitude Decimal	Latitude Degrees Min sec	Longitude Degrees Min sec	UTM X	UTM Y
A	-5.357294	36.117012	-05º21'26"	36º07'01"	287838.622	3999500.341
B	-5.352422	36.11697	-05º21'09"	36º07'01"	288277.106	3999485.094
C	-5.343398	36.114717	-05º20'36"	36º06'53"	289083.333	3999215.539
D	-5.343227	36.114182	-05º20'36"	36º06'51"	289097.359	3999155.773
E	-5.343323	36.112855	-05º20'36"	36º06'46"	289085.162	3999008.799
F	-5.344759	36.107858	-05º20'41"	36º06'28"	288942.457	3998457.491
G	-5.323622	36.108259	-05º19'25"	36º06'30"	290846.42	3998456.271
H	-5.323094	36.091713	-05º19'23"	36º05'30"	290850.079	3996619.392
I	-5.356707	36.091034	-05º21'24"	36º05'28"	287821.546	3996616.953

Figure 9. Eastern MCZs.



Point	Latitude Decimal	Longitude Decimal	Latitude Degrees Min sec	Longitude Degrees Min sec	UTM X	UTM Y
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B	-5.332259	36.13961	-05º19'56"	36º08'23"	290152.406	4001953.172
C	-5.333338	36.12798	-05º20'00"	36º07'41"	290024.337	4000665.161
D	-5.334518	36.115688	-05º20'04"	36º06'56"	289885.29	3999303.968
E	-5.342644	36.116453	-05º20'34"	36º06'59"	289155.905	3999406.423
F	-5.2934	36.143758	-05º17'36"	36º08'38"	293660.284	4002330.061
G	-5.289087	36.143676	-05º17'21"	36º08'37"	294048.151	4002311.766
H	-5.289354	36.131413	-05º17'22"	36º07'53"	293992.044	4000951.792
I	-5.293703	36.131373	-05º17'37"	36º07'53"	293600.518	4000956.671
J	-5.290278	36.124035	-05º17'25"	36º07'27"	293889.589	4000135.198
K	-5.290304	36.117955	-05º17'25"	36º07'05"	293871.293	3999460.7
L	-5.300313	36.117785	-05º18'01"	36º07'04"	292969.93	3999463.14
M	-5.30025	36.123986	-05º18'01"	36º07'26"	292991.884	4000151.054

8. Listed habitats:

8.1. Reefs:

The Gibraltar Marine Reserve is punctuated with natural and artificial reefs containing some of the communities listed under the definition of reefs in the EU's Habitat's Interpretation Manual notably reefs with Gorgonian communities (e.g. *Paramuricea clavata* and *Eunicella singularis* 'forests'), *Astroides calcycularis* and *Lithophyllum lichenoides* facies. *Cystoseira* spp. beds are also found in some intertidal areas of the Southern Waters SAC/SPA.

Consistent with the definition, the reefs also support a diverse variety mobile species such as fish, molluscs, echinoderms and crustaceans. Typical fish species found are White Seabream *Diplodus sargus*, Common Two-banded Seabream *Diplodus vulgaris*, Salema Porgy *Sarpa salpa*, Black Scorpionfish *Scorpaena porcus*, Moray Eel *Muraena helena*, Conger Eel *Conger conger*, Cardinal Fish *Apogon imberbis*, Swallowtail Seaperch *Anthias anthias*, Greater Forkbeard *Phycis phycis*, Dusky Grouper *Epinephelus marginatus* and Ornate Wrasse *Thalassoma pavo*.

Rocky reef outcrop within the Eastern MCZ ©Shaun Matthew Yeo.

Some of the more common, rare and endangered molluscs and gastropods found are the Common and Lesser Octopus *Octopus vulgaris* and *Eledone cirrhosa*, Common Cuttlefish *Sepia officinalis*, Noble and Rough Pen Shells *Pinna nobilis* and *Pinna rudis*, Date Mussel *Lithophaga lithophaga*, *Charonia lampas* and various Nudibranch species including *Babakina anadoni* and *Roboastra europaea*. Echinoderm species such as the Long-spined Sea Urchin *Centrostephanus longispinus* can also be found as well as numerous Crustaceans notably the European Spider Crab *Maja squinado*.

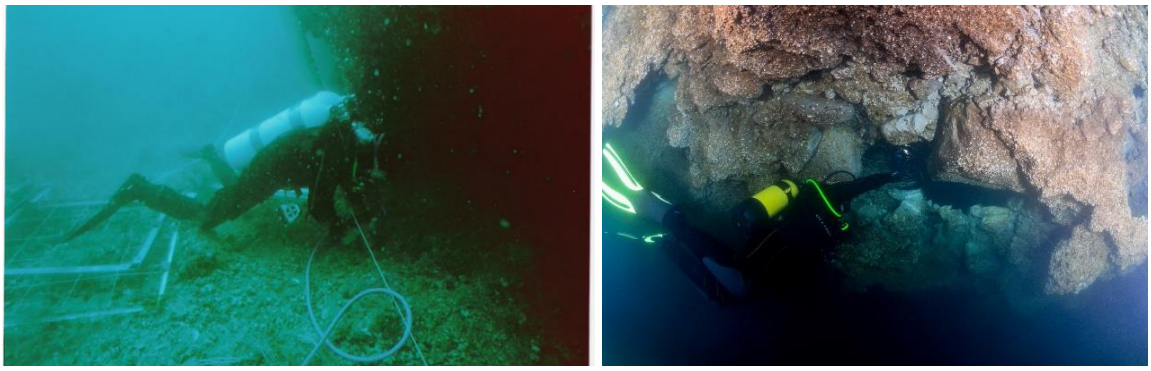
One of the most significant rocky outcrops is Europa Reef. This lies immediately south of Europa Point within the Southern Waters SAC/SPA and extends from the shoreline to over 400m. The reef is an extension of one of a series of marine terraces. Europa foreshore remains above sea-level as a raised beach/intertidal habitat but the reef was submerged after the last ice-age. Closer inshore, the reef is generally fairly shallow, from 2–10m deep and extends to over 50m depth in the southern

sections in an area known locally as 'the peaks'. Strong currents and rip tides continuously affect the area. The position of Europa Reef at the entrance to the Bay and Strait of Gibraltar makes this area a hotspot for marine life that converges on the reef for food and shelter. Europa Reef has therefore long been a popular area for ecological research. There are numerous other reefs found in the Southern Waters such as the Seven Sisters Reef which is further North within the Rosia Marine Conservation Zone. This reef is particularly important given that some of the highest levels of marine invertebrate biodiversity have been recorded here. Other notable reefs include Governor's Beach Reef, Sandy Bay Reef, Vladi's Reef, Eastern Beach Reef and Two-Mile Reef along with other prominent rocky outcrops (e.g. Weaver's Pinnacle and Pete's Pinnacle) that are well-known marine biodiversity hotspots.

Intertidal reef habitats are also very common in the Southern Waters although they have a relatively narrow range due to the small tidal amplitude of the Straits of Gibraltar and Mediterranean Sea generally. This rarely exceeds 1m with the exception of spring tides. However, this narrow strip of habitat is still extremely important and supports a wide variety of marine organisms including protected species as the Mediterranean Ribbed Limpet *Patella ferruginea*, *Cymbula safiana*, *Cystoseira spp.*, Date mussels *Lithophaga lithophaga* and *Lithophyllum spp.* amongst other species. Particular attention is drawn to the Mediterranean Ribbed Limpet in view that the sub- populations found within the Gibraltar Marine Reserve, including the Southern Waters of Gibraltar, are the largest remnant populations of this critically endangered species in the entirety of the Iberian Peninsula.

8.2. Submerged or partially submerged sea caves:

Submerged and partially submerged sea caves are found in a stretch of approximately 4.5 km of coastline in the Southern Waters of Gibraltar. Sea caves in the region support an array of marine life adapted to the progressively diminishing amount of light. Sciaphilic flora, which prefer shaded zones, disappear and the cave walls making up this habitat are colonised with, for example, sponges, anthozoans, bryozoans and decapods. Key locations for submerged sea caves within the Southern Waters of Gibraltar include Europa Reef, Vladi's Reef and also along the Eastside, particularly beyond the 30m isobaths where numerous rocky reef outcrops are found.



Left: Vladi's cave being researched by divers ©Gibraltar Museum. Right: Submerged sea cave in the Eastern MCZ ©Shaun Matthew Yeo

Given the difficulty of surveying sea caves in the Southern Waters, data on species assemblages found within this habitat type, particularly in deep water sea caves, are limited at present although research continues to take place. Some characteristic species found to date in this habitat type

include Orange Coral *Astroides calcycularis*, Sunset Cup Coral *Leptopsammia pruvoti*, *Dendrophyllia ramea*, Gorgonians e.g. *Paramuricea clavata*, *Parazoanthus axinellae*, Date mussels *Lithophaga lithophaga*, Cardinal fish *Apogon imberbis*, Spiny Lobster *Palinurus elephas*, European Lobster *Homarus gammarus* and the Mediterranean Slipper Lobster *Scyllarides latus*.

In addition, partially submerged sea caves also provide habitat for a number of seabird species that utilise cave ledges as nesting sites. These include Mediterranean Shags *Phalacrocorax aristotelis desmarestii*, Pallid Swifts *Apus pallidus* and wintering Crag Martins *Ptyonoprogne rupestris*. European Free-tailed Bats *Tadaroda teniotis* also use this habitat.

9.3. Sandbanks:

A combination of coarse to very fine sands are found within the marine reserve. Bivalves such as the wedge clam *Donax truculus*, Jackknife clam *Ensis minor*, Venus Clam *Chamelea gallina*, Rough cockle *Acanthocardia tuberculata* and the Smooth cockle *Callista chione* are particularly common and widespread on the eastern shelf. Some of the more abundant fish species found in this habitat include Lesser Weaver *Echiichthys vipera*, European Anchovy *Engraulis encrasicolus*, European Pilchard *Sardina pilchardus*, Thick-lipped Grey Mullet *Chelon labrosus*, Bronze Bream *Pagellus acarne*, Striped Sea Bream *Lithognathus mormyrus*, Thornback ray *Raja clavata*, Marbled electric ray *Torpedo marmorata* and Common sole *Solea solea*.

Benthic invertebrate surveys undertaken specifically for ecological classification purposes have identified three main communities in sandy habitats within the Gibraltar Marine Reserve:

- Well-sorted or very shallow sands, with characteristic species present in samples including amphipods *Hippomedon massiliensis* and *Siphonoecetes dellavallei*, the decapod *Diogenes pugilator* and the polychaete *Prionospio malmgreni*;
- Transitional community, between well-sorted or very shallow sand and coastal detritic seabeds, with characteristic species including the decapod *Diogenes pugilator* and the polychate *Sigalion mathildae*; and
- Transitional community, between muddy sands in protected areas and shallow coastal terrigenous mud, with characteristic species including the bivalves *Paphia aurea* and *Nucula sulcate*, the amphipod *Leptocheirus pectinatus* and the polychaetes *Paradoneis lyra* and *Heteromastus filiformis*.

9. Listed Species:

Species listed in Annex II and IV of the Habitats Directive which are found in the Southern waters SAC/SPA and the wider Gibraltar Marine Reserve include the following:

- *Turopsis truncatus* - Bottle nosed dolphin.
- *Caretta* - Loggerhead turtle.
- *Chelonia mydas* - Green turtle.
- *Patella ferruginea* - Mediterranean ribbed limpet.
- *Lithoplaga lithophaga* - Date mussel.
- *Pinna nobilis* - Fan mussel.
- *Centrostephanus longuspinus* - Long spined sea urchin.
- *Balaenoptera physalus* - Fin whale.
- *Delphinus delphis* - Common dolphin.

- *Globicephala maleana* - Long finned pilot whale.
- *Orcinus orca* - Killer whale.
- *Physeter catodon* - Sperm whale.
- *Stenella coeruleoalba* - Striped dolphin.
- *Dermochelys coriacea* - Leatherback turtle.

Some of these are resident species whereas others are present during certain times of the year whilst feeding or during migration. In addition, the NPA 1991 provides protection to a much wider range of marine species that are not listed in the Habitats Directive.

10. Environmental Enforcement:

The competent authority for the protection of the marine environment within the Gibraltar Marine Reserve is the Department of the Environment, Heritage and Climate Change (DEHCC). Other relevant authorities that have powers or functions within the reserve include:

- Environmental Agency;
- Gibraltar Port Authority;
- Ministry of Defence;
- Royal Gibraltar Police;
- H.M. Gibraltar Customs;
- Gibraltar Defence Police;
- Nature Conservancy Council.

The DEHCC established an Environmental Research and Protection Unit (EPRU) in 2013 in order to specifically enforce and implement the necessary conservation measures required for the protection of habitats and species. The EPRU are equipped with two vessels; *Razorbill* - a 7m RHIB and *Storm Petrel* – a 12m cabin cruiser. The EPRU works closely with DEHCC scientists and researchers in order to better understand the habitats and species found in the marine reserve.

PRU's Storm Petrel patrolling the Southern Waters SAC/SPA.

11. Scientific research

The Gibraltar Marine Reserve lends itself to scientific research and the Ministry for the Environment, Heritage and Climate Change supports the use of the reserve for research into species and habitats, or other appropriate areas of research. In all cases, permission is required before any research is carried out in line with the requirements of the Nature Protection Act 1991.

The Department of the Environment, Heritage and Climate change requires at least one month notice of any research in order to grant permission, but more time may be needed if other entities need to be consulted. We advise that as much notice as possible is given, particularly if you need to arrange transport and accommodation in the area. The notice period is required as we have to consult with other entities such as the Nature Conservancy Council and organisations such as the Gibraltar Ornithological and Natural History Society.

What we need to know

In order to make an informed decision, the following information is required:

- Where exactly you wish to carry out the work;
- What the work entails;
- Whether you need to obtain samples;
- When you would like to undertake the work;
- A brief summary of the research aims and objectives.

Provision of research data and publications

It is a standard requirement for all research licenses that a copy of the results is made available to the Department of the Environment, Heritage and Climate Change at no cost.

Health and Safety

The Department of the Environment, Hertiage and Climate Change endeavours to ensure the safety of the general public within the reserve. It is the responsibility of the researcher to undertake suitable risk assessments and to have suitable insurance for the work being undertaken. Whilst the Department can advise on risks and hazards, it is the responsibility of researchers to ensure that is carried out work safely with appropriate measures in place.

Further information

For more information on obtaining a research license in the marine reserve, please contact us on:

Department of the Environment
Leanse Place
Town Range
Tel No: (+350) 20048450
Email: info.environment@gibraltar.gov.gi
Website: www.thinkinggreen.gov.gi

12. Generic conservation measures for activities in the marine reserve:

Conservation measures are mechanisms and actions implemented to achieve the Conservation Objectives that have been determined for the marine reserve. These must respond to the ecological requirements of the natural habitat types listed under Annex I and species listed under Annex II and IV of the Habitats Directive. Both generic and habitat/species-specific conservation and restoration measures are being implemented within the Gibraltar Marine Reserve which includes the Southern Waters of Gibraltar SAC/SPA. The latter are included in Sections 14 and 15. These should be read in conjunction with the Conservation Objectives and Target Indicators developed for the marine reserve.

Generic conservation measures have been broken down into the following categories:

i. Water quality;
ii. Port activities and shipping;
iii. Water-based recreation;
iv. Fishing activities.

These categories reflect the broad range of issues known by the Relevant Authorities that require careful management to safeguard protected habitats and species. However, this list could be changed in future reviews in order to take account of any new activities that may they arise. For each activity group, consideration is made of individual activities and their current management, together with an assessment of any gaps in the management or in the knowledge about the activity's effect on the marine reserve.

12.1. Water Quality:

There is no land-based heavy industry in Gibraltar but this does exist in the North section of the Bay in Spain and could impinge on the conservation objectives of the marine reserve. In addition, the Bay is increasingly becoming a more prominent shipping hub which increases the risks of accidental spills and other impacts on coastal water quality.

There are three designated bathing areas on the West side of Gibraltar (Western Beach, Camp Bay and Little Bay) and another three on the eastern side of Gibraltar (Sandy Bay, Catalan Bay and Eastern Beach). The Environmental Agency (EA) monitors bathing water quality on a fortnightly basis at these beaches, which are all found within the Gibraltar Marine Reserve, to ensure that 'excellent' bathing water quality is achieved and or maintained. Information on any of Gibraltar's bathing sites is available onsite and online[5].

Further to the monitoring carried out by the EA, the DEHCC is also monitoring the coastal waters of Gibraltar as part of Gibraltar's obligations under the Water Framework Directive 2000/60/EC and the Marine Strategy Framework Directive 2008/56/EC. A comprehensive water quality monitoring programme which includes benthic invertebrate, fish tissue and sediment quality monitoring is operational. Any proposed discharges to the sea are heavily regulated and are monitored by the DEHCC and EA who also respond to reports of pollution incidents and can co-ordinate clean-up campaigns.

[5] http://environmental-agency.gi/index.php/bathing-water/

Oil spills are a potentially serious threat to the Southern Waters SAC/SPA and the wider marine reserve given the high numbers of ships crossing the Straits of Gibraltar. However, there is a comprehensive management structure in place along with the necessary contingency plans to mitigate the risks on the marine reserve.

12.1.1. Run-off from roads and hard surfaces adjacent to the marine reserve:

	Relevant Authorities	Other Competent Authorities	Other associated organisations
Authorities associated with activity	DEHCC Technical Services Department	Environment Agency	Local contractors
Location	Storm water outflows around Gibraltar's Coastline.		
Frequency	Occasional, frequent with torrential heavy rainfall following a period of dry weather.		
Potential effects	• Toxic contamination from chemicals, hydrocarbons, etc. Toxins can affect the marine fauna and flora directly or through bioaccumulation. • Turbidity and habitat smothering may occur close to outlets.		
Ongoing management measures	• The DEHCC continually monitors BGTW for any signs of contamination. Hydrocarbons and heavy metals are monitored by the DEHCC as part of the coastal water monitoring programme. Bioaccumulation analyses in filter feeders are also carried out by DEHCC in collaboration with CEFAS UK. • Trapped gullies intercept most hybrocarbons and contaminants running off from roads. Gullies are cleaned six times a year at key locations • If oil or any other contaminants emanating from road run-off were found in water samples this would be investigated by the DEHCC together with the Environmental Agency who would take the required action to mitigate and prosecute any observed impacts.		
Timescale	Conservation measures Implemented. Reviewed on a yearly basis.		

12.1.2. Industrial discharges from land:

Relevant Authorities	DEHCC Environment Agency
Location	There are trade effluent discharges to the eastside, which is the discharge from the Reverse Osmosis Plant situated in the vicinity of Europa Point.
Frequency	Continuous
Potential effects	• Any toxic contamination or hyper-saline effluent could affect marine fauna and flora. • Changes in salinity, temperature and biological oxygen demand near outfalls.
Ongoing management measures	• Discharge consents are issued by the DEHCC and EA. • All industrial discharges are heavily regulated and are monitored by the DEHCC. • The DEHCC works with the EA and (i) responds to reports of pollution incidents (ii) co-ordinates clean-ups and (iii) has powers tp prosecute polluters.
Monitoring requirements	Continue regular physical, chemical and biological monitoring.
Timescale	Conservation measures Implemented. Regularly reviewed by the DEHCC. Minimum review frequency – Monthly.

12.1.3. Wastewater discharges:

	Relevant Authorities	Other Competent Authorities	Other associated organisations
Authorities associated with activity	DEHCC Environment Agency	Technical Services Department	Ministry of Defence (MOD)

Location	Europa Point.
Frequency	Continuous.
Known effects	• Elevated levels of heavy metals, pharmaceutical products and other contaminants that may be found in sewage effluent. • Elevated nutrient levels. • Intertidal and subtidal changes in community structure particularly in the immediate vicinity of the discharge outfall.
Research undertaken	Various studies have been commissioned by the DEHCC on the flow and load of the sewage system as well the ecological impacts of the existing outfall. This information has been used as part of the Environmental Impact Assessment for the new sewage treatment plant.
Monitoring requirements	Continue physical, chemical and biological monitoring.
Ongoing management measures	• Discharges from land are subjected to European Directive requirements e.g. Urban Waste Water Treatment and Water Framework Directives. • Wastewater discharges from ships are prohibited in the entirety of BGTW. • All the bathing waters are monitored by the Environmental Agency in line with the Bathing Water Directive. • The Environmental Agency responds to reports of pollution incidents, co-ordinates clean-ups and prosecutes polluters.
Gaps in management	Secondary Sewage Treatment works in the process of being constructed.

New measures required	Relevant authority to implement new actions	Timescale
Construction and commissioning of a new sewage treatment plant. The tender for the design and build of a secondary treatment plant has been ongoing and a preferred bidder has been appointed.	HMGoG	December 2020

12.1.4. Oil Spills:

	Relevant Authorities	Other Competent Authorities	Other associated organisations
Authorities associated with activity	Gibraltar Port Authority Gibraltar Maritime Administration	DEHCC Environmental Agency	Oil Spill Response Limited (UK)
Location	Incidents could occur throughout the marine reserve given its location within a major shipping channel.		
Frequency	Not common. Minor incidents (Tier 1 and 'trace') occur about 12 times per year. Tier 2 spills have occurred in the past but have been due to the collision or grounding of vessels.		
Potential effects	Toxic contamination of listed habitats and species including seabirds. Impacts on recreation, tourism and fishing.		
Monitoring undertaken	Physical, chemical and biological monitoring consistent with the requirements of the Water Framework and Marine Framework Directives with an emphasis on bunkering activities that take place within the Bay of Gibraltar.		
Ongoing management measures	• Bunkering Code of Practice developed and implemented by the GPA. • Each Bunkering Operator, as well as the GPA, maintain equipment and personnel for a 'Tier 1' incident (small spill size which varies depending on circumstances but could be up to 500 litres). • For larger tier spills the GPA activates a joint response procedure to make available equipment and personnel of all members. GPA retains oil spill contractors (currently Oil Spill Response Ltd). • The DEHCC and GPA liaise closely when clean-up operations are necessary. Oil spill response training undertaken on a regular basis covering incident management and deployment of equipment. • Ensuring Bunkering Code of Practice and Management Plan are integrated.		
Timescale	Conservation measures Implemented. Regularly reviewed by the DEHCC. Minimum review frequency – Monthly.		

12.1.5. Anti-fouling cleaning systems including paints:

	Relevant Authorities	Other Competent Authorities
Authorities associated with activity	Gibraltar Port Authority DEHCC	Gibraltar Maritime Administration Environmental Agency
Location	Hull cleaning activities only occur in the western anchorage of the Port of Gibraltar	
Frequency	Infrequent	
Potential effects	• Generation of bio-fouling waste from ship hulls as a result of hull cleaning operations. • Chemical contamination due to the removal of anti-fouling paint layers (e.g. copper-based paint). • Historical use of Tributyltin as an anti-fouling paint is known to have ecological impacts particularly in marine gastropods.	
Monitoring undertaken	Physical, chemical and biological monitoring. Metals associated with anti-fouling paints such as copper and zinc along with a range of compounds are routinely monitored as part of the DEHCC's marine monitoring programme.	
Ongoing management measures	• Regular compliance checks to ensure that TBT based paints are not applied or stripped when hull cleaning operations take place. Any vessels entering the Port require proof of certification with regards adherence to the IMO's TBT ban. • Strict licensing conditions on the location, depth and environmental conditions under which hull cleaning operations may take place. • Facilitating the transition towards zero-waste hull cleaning systems.	
Timescale	Conservation measures Implemented. Regularly reviewed by the DEHCC. Minimum review frequency – Monthly.	

12.2. Port activities and shipping:

The Port of Gibraltar is one of the main shipping hubs in the Strait together with the Ports of Algeciras and Tangiers. In addition to ship calls, which include cruise ships, Gibraltar has four recreational marinas within BGTW.

Any new projects within the Port of Gibraltar are caught by Section J of the Nature Protection Act 1991. This Management Plan considers the on-going operation of the Port and any impacts that it could have on the Southern Waters or the wider marine reserve. The Gibraltar Port Authority (GPA) monitors commercial anchoring points using their VTS Radar Facility so as to ensure that vessels anchor within allocated areas and not within the anchoring exclusion zone. Anchoring activities by recreational vessels are strictly monitored by the GPA in conjunction with the Royal Gibraltar Police marine section. Such operations are not allowed in the vicinity of listed habitats that require strict protection. In addition, the GPA and DEHCC strictly enforce a ban on any unauthorised discharges from vessels in BGTW. Any vessels found in contravention of the ban are liable to prosecution.

Port operators have become more aware of their environmental responsibilities in recent years and are actively pursuing policies that limit the impact of their operations on the environment, whilst contributing to sustainable development. The Port operators are licensed by the Gibraltar Port Authority who ensures that there is full compliance with the requirements of local, European and international maritime legislation.

The GPA has a Port Waste Management Plan[6] in accordance with the requirements of the Merchant Shipping (Port Waste Reception Facilities) Regulations 2002. This plan outlines the responsibilities of all parties involved in the port waste management chain, including the responsibility of the ship, the ship's agent, waste contractors, GPA, the GMA, the EA, the DEHCC and any third parties appointed to assist in the enforcement of the waste reception and handling plans. The plan also covers how the wider waste management system operates within the Port, including reporting, record-keeping, charging system, complaints, consultation and review process.

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[6] http://www.gibraltarport.com/WasteManagement

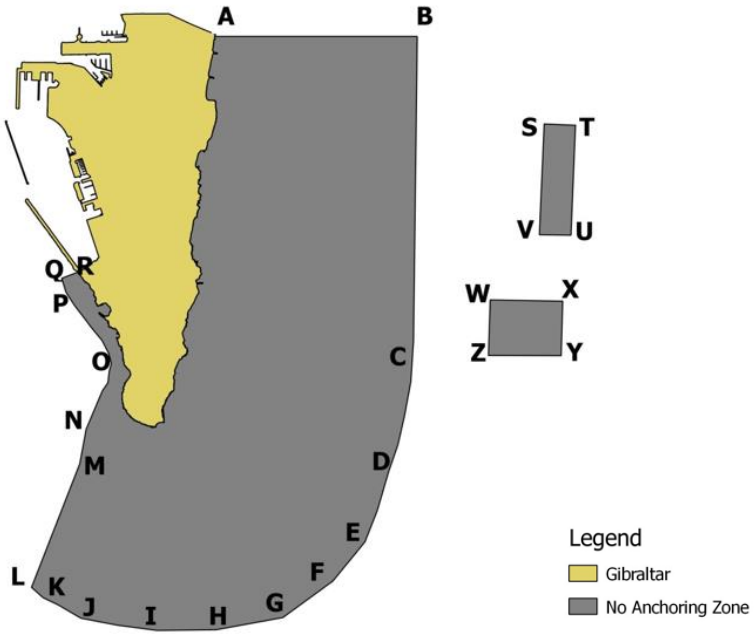
12.2.1. Maintenance dredging:

	Relevant Authorities	Other Competent Authorities
Authorities associated with activity	DEHCC GPA	EA
Location	The approaches to and within the Port of Gibraltar. Dredging is prohibited within the Southern Waters	
Frequency	As required – low.	
Potential effects	• Physical damage of sandy habitat and species found therein. • Erosion and/or changes in sedimentary transport patterns. • Changes in sediment composition leading to potential changes in fauna and flora. • Underwater noise. • Potential release of contaminants through sediment redistribution.	
Ongoing management measures	• Regular bathymetrical surveys carried out to ensure navigational safety in the Port of Gibraltar. • Physical, chemical and in some cases biological analyses are required as part of dredging licence applications. • Silt curtains required by the DEHCC if dredging works are required in the vicinity of protected habitats or species. • Regular liason between the GPA and DEHCC in relation to any marine works including proposed dredging activities in the Port of Gibraltar.	
Timescale	Conservation measures Implemented. Reviewed by the DEHCC on a case-by-case basis.	

12.2.2. Anchoring:

	Relevant Authorities	Other Competent Authorities
Authorities associated with activity	GPA	Gibraltar Pilots Association GMA DEHCC
Location	Allocated areas within British Gibraltar Territorial Waters.	
Frequency	Common.	
Potential effects	• Physical damage to habitat, particularly reefs and species therein. • Underwater noise.	
Research undertaken	High resolution bathymetric survey of the entirety of British Gibraltar Territorial Waters to delimit significant reef habitats.	
Ongoing management measures	• GPA's VTS Radar System constantly monitors all vessels anchoring in British Gibraltar Territorial Waters. • No Anchoring Zones are strictly enforced around protected reef habitats (Figure 10). Anchoring is only permitted within designated areas away from areas of conservation importance. These zones are regularly reviewed and updated in keeping with the DEHCC's marine monitoring programme which includes underwater noise monitoring. • Fixed mooring buoys for small and medium sized pleasure craft created within sensitive areas in the Southern Waters of Gibraltar SAC/SPA e.g. Seven Sisters.	
Timescale	Conservation measures Implemented. Regularly reviewed by the DEHCC. Minimum review frequency – Monthly	

Figure 10. No anchoring zones located in British Gibraltar Territorial Waters.



Point	Latitude Decimal	Longitude Decimal	Latitude Degrees Min sec	Longitude Degrees Min sec	UTM X	UTM Y
A	-5.338927	36.152624	-05º20'20"	36º09'09"	289587.119	4003411.423
B	-5.311109	36.153165	-05º18'40"	36º09'11"	292091.482	4003411.423
C	-5.310766	36.117436	-05º18'39"	36º07'03"	292028.058	3999446.765
D	-5.312523	36.107112	-05º18'45"	36º06'26"	291842.662	3998305.119
E	-5.316664	36.096829	-05º19'00"	36º05'49"	291442.598	3997173.231
F	-5.320976	36.092348	-05º19'16"	36º05'32"	291042.534	3996685.348
G	-5.327569	36.088087	-05º19'39"	36º05'17"	290437.559	3996226.739
H	-5.336513	36.086417	-05º20'11"	36º05'11"	289627.674	3996060.858
I	-5.344851	36.086254	-05º20'41"	36º05'11"	288876.334	3996060.858
J	-5.355506	36.087453	-05º21'20"	36º05'15"	287920.084	3996216.981
K	-5.360553	36.089552	-05º21'38"	36º05'22"	287471.232	3996460.922
L	-5.362269	36.090749	-05º21'44"	36º05'27"	287319.988	3996597.529
M	-5.356098	36.104547	-05º21'22"	36º06'16"	287912.766	3998114.845
N	-5.355348	36.108476	-05º21'19"	36º06'31"	287990.827	3998549.061
O	-5.352047	36.115884	-05º21'07"	36º06'57"	288307.951	3999363.825
P	-5.358573	36.123891	-05º21'31"	36º07'26"	287742.007	4000266.409
Q	-5.359129	36.125255	-05º21'33"	36º07'31"	287695.658	4000418.872
R	-5.356969	36.12599	-05º21'25"	36º07'34"	287892.031	4000495.713
S	-5.2934	36.143758	-05º17'36"	36º08'38"	293660.284	4002330.061
T	-5.289087	36.143676	-05º17'21"	36º08'37"	294048.151	4002311.766
U	-5.289354	36.131413	-05º17'22"	36º07'53"	293992.044	4000951.792
V	-5.293703	36.131373	-05º17'37"	36º07'53"	293600.518	4000956.671
W	-5.290278	36.124035	-05º17'25"	36º07'27"	293889.589	4000135.198
X	-5.290304	36.117955	-05º17'25"	36º07'05"	293871.293	3999460.7
Y	-5.300313	36.117785	-05º18'01"	36º07'04"	292969.93	3999463.14
Z	-5.30025	36.123986	-05º18'01"	36º07'26"	292991.884	4000151.054

12.2.3. Introduction of non-native species from ballast water discharges.

Relevant Authorities	
Authorities associated with activity	DEHCC GPA GMA
Location	Throughout BGTW with the exception of Gibraltar harbour.
Potential effects	Release of untreated ballast waters may introduce non-native or invasive species.
Monitoring undertaken	• Physical, chemical and biological monitoring. • DEHCC Scientific Dive Team regularly monitor BGTW for any records of non-indigenous species (NIS). • DEHCC has expanded its capabilities in NIS monitoring by setting up citizen-science projects with stakeholders e.g. dive clubs, non-governmental organisations, etc.
Ongoing management measures	• GPA exercises controls on the discharge of ballast water in selected locations within BGTW. • Regular training and education workshops for the identification of NIS e.g. Horizon Scanning (see: http://www.nonnativespecies.org/index.cfm?pageid=636).
Gaps in management	Regional cooperation with the aim of forming a transboundary invasive species alert system.
Timescale	Conservation measures Implemented. Regularly reviewed by the DEHCC. Minimum review frequency – Quarterly. Additional control measures will be enforced when the Ballast Water Convention is applicable.

12.2.4. Point-source air pollution from shipping.

Relevant Authorities	
Authorities associated with activity	DEHCC GPA GMA EA
Location	Throughout British Gibraltar Territorial Waters
Frequency	Regular.
Potential effects	• Deterioration of local air quality. • Deterioration of coastal water quality and subsequent impacts on ecological receptors.
Ongoing management measures	• GPA and GMA inspect and enforce emission standards with the ability to prosecute non-compliant vessels whilst in BGTW. • Comprehensive air quality monitoring network setup onshore which is continuously reviewed by DEHCC and the EA. Results are available in real time from www.gibraltarairquality.gi. • Physical, chemical and biological monitoring of sensitive receptors including, but not limited to listed habitats and species.
Timescale	Conservation measures Implemented. Regularly reviewed by the DEHCC. Minimum review frequency – Quarterly.

12.3. Water-based recreation.

The Gibraltar Marine Reserve has an exceptionally high recreational value for both locals and tourists. The sheltered waters of the Bay of Gibraltar coupled with the favourable climate that characterises the region make the reserve an attractive location for water-sports including sailing, jet skiing and power boating. There are also six public beaches found within the Gibraltar Marine Reserve. These include Western Beach, Camp Bay and Little Bay on the Western side of Gibraltar and Sandy Bay, Catalan Bay and Eastern Beach on the East. All these beaches are located inside the Gibraltar Marine Reserve. Given the high-level of recreational use, conservation measures are required to safeguard protected habitats and species including cetaceans and marine reptiles.

Catalan Bay during the summer season.

12.3.1. Cetacean Protocol.

The Cetacean Protocol is one of the key mechanisms implemented in the marine reserve to protect dolphins and whales from recreational and commercial vessel activity given that several species of cetaceans use the Bay as feeding and calving grounds. The Protocol is enshrined in domestic law under Schedule 2 of the Marine Protection Regulations 2014 and is enforced by the DEHCC's EPRU. The Protocol hinges on a Mobile Cetacean Conservation Area which is defined as an imaginary cylinder of sea and air space with a 500m radius centred on the cetacean or group of cetaceans, with a height of 500m into the air and a depth of 60m under the sea.

Five zones are established within the Mobile Cetacean Conservation Area within which a specific code of conduct is set out depending on the distance from the animals under protection. The Mobile Cetacean Conservation Area is made up of the following zones:

(a) The Exclusion Zone has a radius of no less than 60m from the cetacean or group of cetaceans. Considering special requirements for the protection of cetaceans a larger exclusion zone may be defined by DEHCC.

(b) The Restricted Access Zone is the area between the limit of the exclusion zone (60m) and the Approach Zone (300m).
(c) The Approach Zone extends from the 300m limit of the Restricted Access Zone and the 500m limit of the Mobile Cetacean Conservation Area.
(d) The Air Space is the space with a 500m radius centred on the cetacean or group of cetaceans and 500m into the air.
(e) The Submarine Space is the space with a 500m radius centred on the cetacean or group of cetaceans and extending 60m beneath the surface.

General code of conduct

(a) Bathing and diving are prohibited in the Exclusion Zone.
(b) Feeding of the animals is prohibited. No foodstuffs, drinks, waste, rubbish, litter or any other object, solid or liquid substance which may be harmful may be thrown into the sea.
(c) Any physical contact between the animals and persons or vessels must be prevented and avoided.
(d) The free movement of the cetaceans must be permitted at all times and in all directions without limiting their freedom of movement by intercepting their trajectory, cutting across their path or passing through one of their groups.
(e) It is prohibited to separate or disperse a group of cetaceans. Nothing and no- one must ever come between an adult and its young, unless this can be justified on grounds of safety or conservation of the species.
(f) The Mobile Cetacean Conservation Area shall be left if there is any sign of alarm, discomfort or alteration of the behaviour of a cetacean or group of cetaceans, such as sudden changes in direction or speed, sudden jumps on approach, etc.
(g) It is forbidden to produce noise or high pitched sounds which may disturb the animals, unless this is necessary for public safety or for the protection of cetaceans. The emission of sounds under the surface in order to attract or repel cetaceans is forbidden.
(h) In the event of a vessel carrying out non-recreational activities being approached by cetaceans, the vessel shall continue without any abrupt changes or if possible, the activity shall stop. In all cases, the vessel shall act according to reasonable criteria in the best interests of the protection and conservation of the animals.

Code of conduct applicable to recreational vessels observing cetaceans within the Mobile Cetacean Conservation Area:

(a) Sonar and depth sounders shall be turned off.
(b) Vessels shall move at a constant speed no greater than four knots, or no greater than the slowest animal in the group except in the Exclusion Zone. Once the observation is over, the vessel's speed shall not change until it is outside the Mobile Cetacean Conservation Area.
(c) All approaches to cetaceans shall be gentle and convergent with the direction of movement of cetaceans, never at right angles to the direction of movement of the animals, nor from the front or behind, and must be at an angle of at least 30 degrees of their direction of movement.
(d) During periods of observation the vessel must continue on a parallel course, without abrupt changes in direction or speed.
(e) When more than one vessel approaches the same cetacean or group of cetaceans simultaneously, these should co-ordinate their approach and manoeuvres by radio so that there will be a minimum impact on the animals.

(f) On turning off the engine and after starting up, it shall be maintained at neutral or out of gear for at least one minute. All changes in speed or revolutions of the engine shall always be carried out gradually and slowly.
(g) The vessels shall never be put in reverse except in an emergency or to avoid a collision with another vessel or with a cetacean.
(h) It is prohibited to navigate in a circle around a cetacean or group of cetaceans.

Specific regulations regarding recreational cetacean watching activities in the different zones:

In the Exclusion zone:

(a) It is forbidden to enter or remain in this zone, except in emergency situations or for reasons of health and safety of persons or the conservation of species.
(b) If the animals approach or appear within 60m of a vessel, the engine will be placed in neutral or stopped if possible.
(c) It is forbidden to start the propeller or the engine while the animals are less than 60m of the vessel, and they may only be started up several minutes after the animals have started leaving the Exclusion Zone. In case of emergency the engine should be started slowly and any manoeuvre should be gradual and progressive, taking special care that no animals are near the propeller.
(d) Only in the case that the cetaceans approaching the vessel are dolphins, the vessel need not be stopped. The vessel may continue moving maintaining its speed and course, without any sudden changes in speed or direction of movement.

In the Restricted Access Zone:

(a) It is forbidden to enter this zone if the animals are feeding or moving away to maintain their distance.
(b) It is forbidden to enter this zone if there are adults with young or young on their own.
(c) Only one vessel may remain in this zone at any one time for a period no of more than 20 minutes. After this time the vessel must leave the Mobile Cetacean Conservation Area completely.
(d) Only two successive entries into this zone are allowed by two different vessels after which time the cetacean or group or cetaceans must not be approached for 30 minutes.

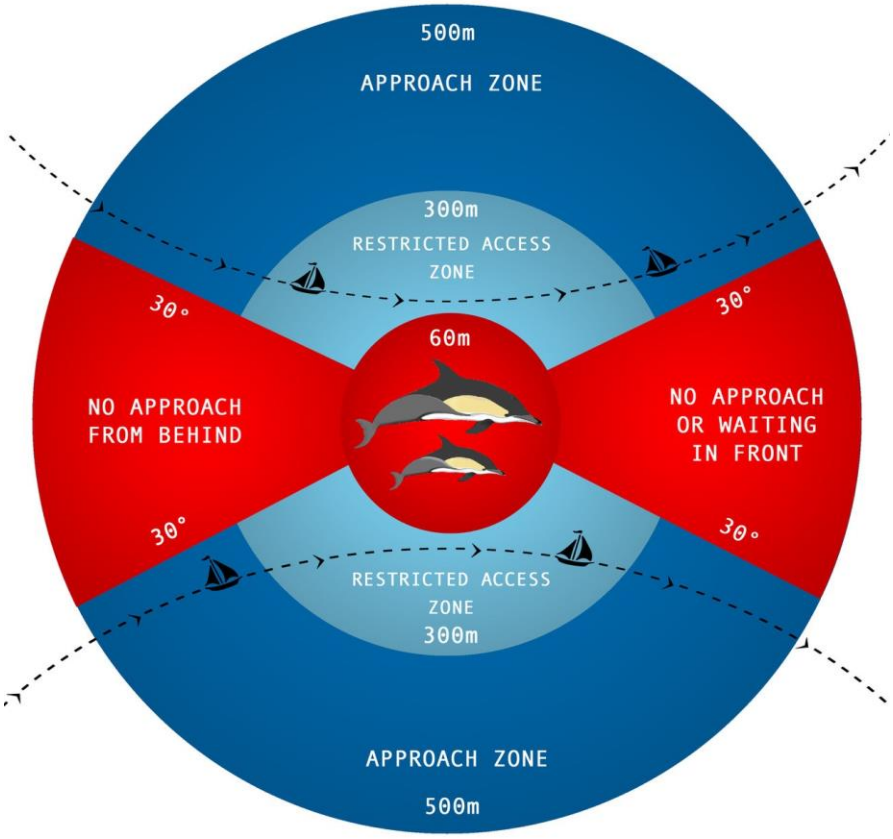
In the Approach Zone:

Only one vessel may remain in this zone awaiting entry into the Restricted Access Zone when one of the vessels then has to leave this zone on expiry of their 20 minutes. All vessels must be in continuous radio contact to co- ordinate their movements.

In the Air & Submarine Space:

Entry is prohibited into these zones.

Figure 11. Different zones found within the Mobile Cetacean Conservation Area.



EPRU officials engaging recreational fishermen in the Southern Waters and distributing informative leaflets on the Cetacean Protocol.

12.3.2. Sailing and motorised crafts.

	Relevant Authorities
Authorities associated with activity	GPA RGP DEHCC
Location	Throughout BGTW.
Frequency	Common. Increased intensity over the summer months.
Potential effects	• Underwater noise. • Non-toxic contamination from litter or accidental spills. • Physical damage from small anchors. • Collisions with species such as marine reptiles and/or cetaceans.
Ongoing management measures	• GPA and GMA licence the use of recreational crafts in BGTW. • Implementation of educational awareness programs on safety at sea, including navigation, carried out by the GPA and RGP. • No discharges from small craft are allowed within BGTW. Marinas in Gibraltar have waste collection points for different waste streams. • Cetacean protocol enforced by the DEHCC in the requirements of the Marine Protection Regulation 2014. • No anchoring zones created (see section 13.2.2). • Underwater noise monitoring programme carried out by the DEHCC.
Timescale	Conservation measures Implemented. Regularly reviewed by the DEHCC. Minimum review frequency – Quarterly.

12.3.3. Scuba diving.

Gibraltar's Marine Reserve offers a unique experience given its rich underwater heritage and marine life which is accessible to all levels of scuba divers. Wreck dives are amongst the most popular in the scuba diving realm and these are easily accessible from the shores of the Southern Waters.

	Relevant Authorities	Other Competent Authorities	Other associated organisations
Authorities associated with activity	DEHCC	RGP GPA	Fishing Working Group Diving clubs

Location	Throughout BGTW.
Frequency	Regular. Weather dependent.
Potential effects	• Noise and disturbance. • Physical damage to benthic habitats.
Ongoing management measures	• Recreational diving and dive operator licensing regime created under the MPR 2014. • Monitoring and restricting the frequency and number of divers visiting specific reef and submerged sea cave habitats. • Implementation of a Citizen Science project to increase awareness and data available for protected habitats and species including threats to the marine reserve. • Enforcement of diving conditions and restrictions carried out by the EPRU.
Timescale	Conservation measures Implemented. Regularly reviewed by the DEHCC. Minimum review frequency – Quarterly.

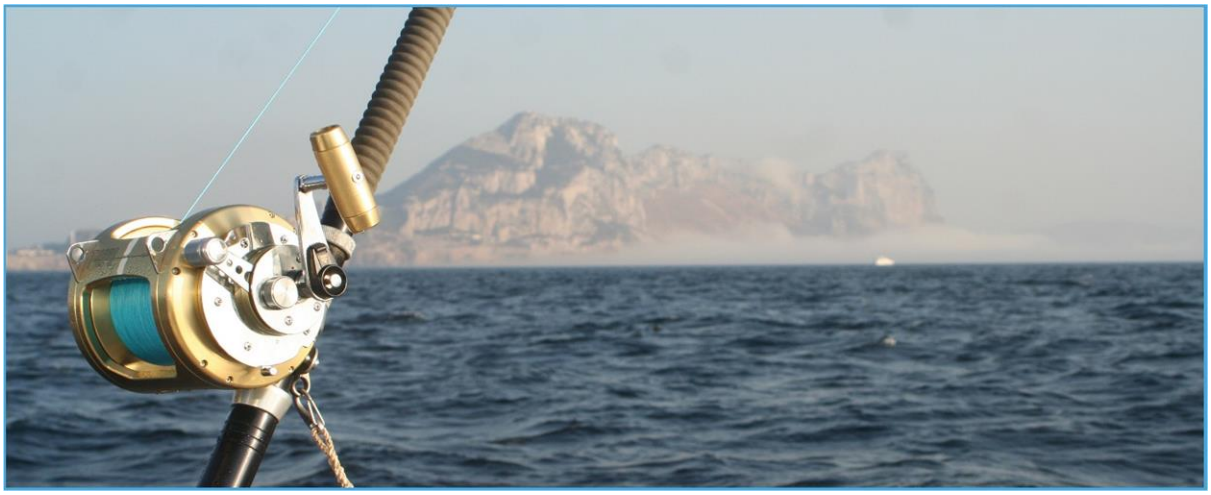
Team composed of NGOs, DEHCC, scuba diving clubs and concerned citizens organise a marine litter removal campaign as part of the World Oceans Day celebrations. Voluntary marine clean-ups such as those spearheaded by the Environmental Safety Group and the Nautilus Project are effective conservation measures to counteract marine litter in the reserve.

12.4. Fishing activities.

Gibraltar has no industrial or commercial fishing fleet. Specific fishing methods employed by commercial fisheries are proscribed under the Nature Protection Act 1991. In addition, the EU's Common Fisheries Policy (CFP) (Regulation 2371/2002) is not applicable to BGTW. This allows for the implementation of conservation measures beyond the scope of the CFP. Prohibited fishing gears and methods in the entirety of BGTW currently include:

- Seine nets;
- Gill nets including trammels;
- Drift nets;
- Any pot or device for raking the sea-bed; and
- Any form of artificial light used to attract fish.

Small-scale subsistence fishing does take place and the marine resources found in BGTW are highly varied in terms of the composition of species, especially those targeted by anglers, their population dynamics and the management measures implemented. Fish species targeted both within BGTW and in adjacent waters are a mixture of local and regional stocks. During certain times of the year, highly migratory stocks pass through Gibraltar's waters from the Atlantic through the Straits of Gibraltar and from the Mediterranean. The management of fishing activities within BGTW is critically dependent on accurate information about the state of the stocks, the fishing pressures on these stocks and other maritime activities or environmental pressures. As a precautionary conservation measure, both the Nature Protection Act 1991 and the Marine Protection Regulations 2014 prohibit commercial fishing using proscribed methods in BGTW and *de facto* in the Gibraltar Marine Reserve.



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Until recently, there was limited information on the status of fish communities in BGTW. A separate report looking at the management of marine living resources in BGTW was produced by an independent Fishing Expert Working Group (Tydeman and Lutchman, 2013) and this report arrived at similar conclusions to the MSFD's Initial Assessment of BGTW in that the data available had been insufficient in providing clear trends of fish stocks. However, following the publication of the Marine Protection Regulations 2014, the amount of information on fish species and abundance that has been collected by the DEHCC has increased significantly. A Guidance Booklet of the main fish species targeted by recreational anglers in the marine reserve together with their corresponding minimum sizes has been produced for public dissemination and awareness.

12.4.1. Recreational angling from the shore and vessels including spearfishing.

	Relevant Authorities	Other Competent Authorities	Other associated organisations
Authorities associated with activity	DEHCC - EPRU	RGP	Fishing Working Group Recreational Fishing Clubs

Location	All areas of the coastline accessible to anglers.
Frequency	Regular. Weather dependent.
Potential effects	• Trampling over sensitive intertidal habitats. • Physical damage to habitat, particularly reefs and species therein from anchors. • Disturbance. • Contamination e.g. litter and loss of fishing line and gear. • Impact on population numbers of target species.
Ongoing management measures	• Creation of no-take and no anchoring zones e.g. Seven Sisters, Mid-Harbours, Europa Advance cliffs and Sandy Bay. • Installation of Pan-Tilt-Zoom cameras to allow for the continuous surveillance of no-take and no anchoring zones. • Licensing all forms of recreational fishing. • Enforcement of Minimum Sizes included under Schedule 4 of the MPR. • Enforcement of catch limits for Species in Need of Strict Protection listed under Schedule 2 of the MPR. • Restrictions on the number of rods and hooks per angler. • Restrictions on fishing from all beaches from the 15th April to 15th October. • Enforcement of temporary bans for specific species e.g. Octopus. • Prohibition of fishing with SCUBA equipment. • Enforcement of the Cetacean protocol by the DEHCC in line with the requirements of the Marine Protection Regulations 2014. • Public awareness campaigns of sustainable fishing practices.
Timescale	Conservation measures Implemented. Regularly reviewed by the DEHCC. Minimum review frequency – Quarterly.

Figure 12. Seven Sisters No fishing and No anchoring zone.

Buoy	Decimal (Google Maps)	DM (Degrees Minutes)	DMS (Degrees Minutes Seconds)	UTM (Universal Traverse Mercator)	Depth (M)
1	36.124595, -5.357005	36 7.4757, -5 21.4203	36 7 28.542, -5 21 25.218	287884, 4000341	-21.98
2	36.124148, -5.357303	36 7.4489, -5 21.4382	36 7 26.931, -5 21 26.290	287856, 4000292	-25.94
3	36.123208, -5.356486	36 7.3925, -5 21.3891	36 7 23.550, -5 21 23.349	287927, 4000186	-23.68
4	36.122269, -5.355680	36 7.3361, -5 21.3408	36 7 20.167, -5 21 20.448	287997, 4000080	-23.39
5	36.122686, -5.355104	36 7.3611, -5 21.3062	36 7 21.668, -5 21 18.373	288050, 4000125	-16.63

Figure 13. Mid-harbour No fishing zone.

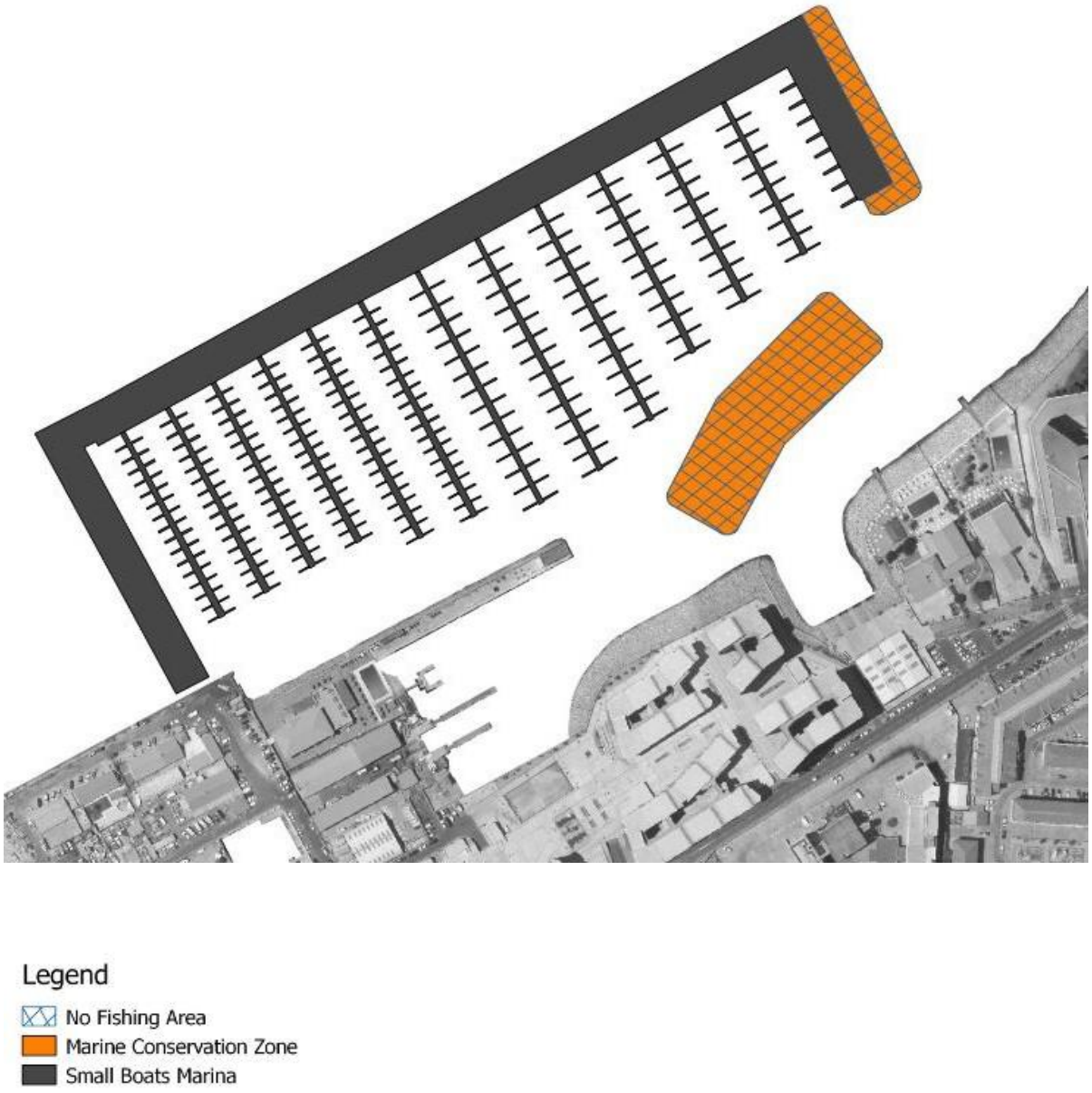


Figure 14. Eastside Cliffs No fishing zone.

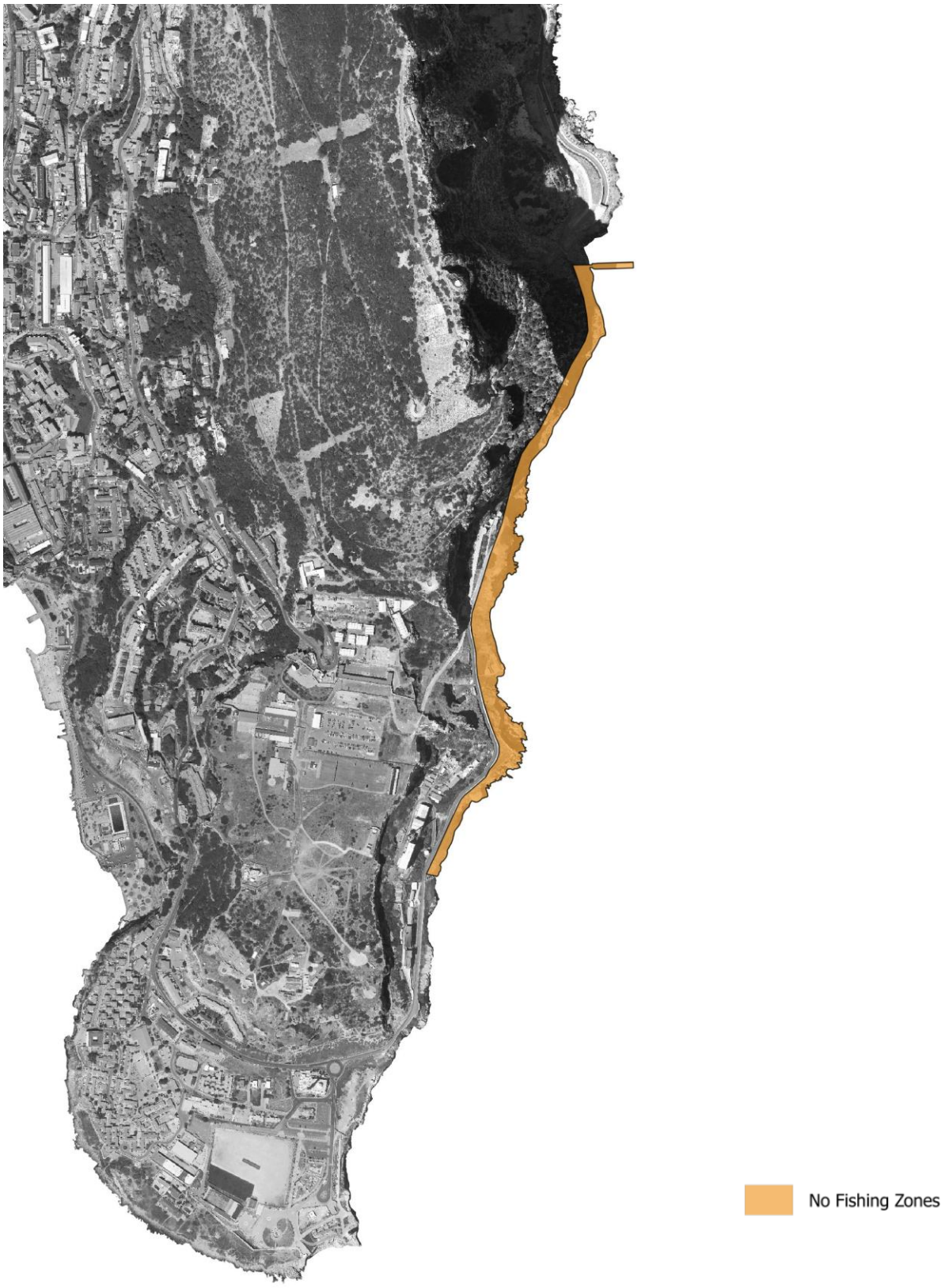
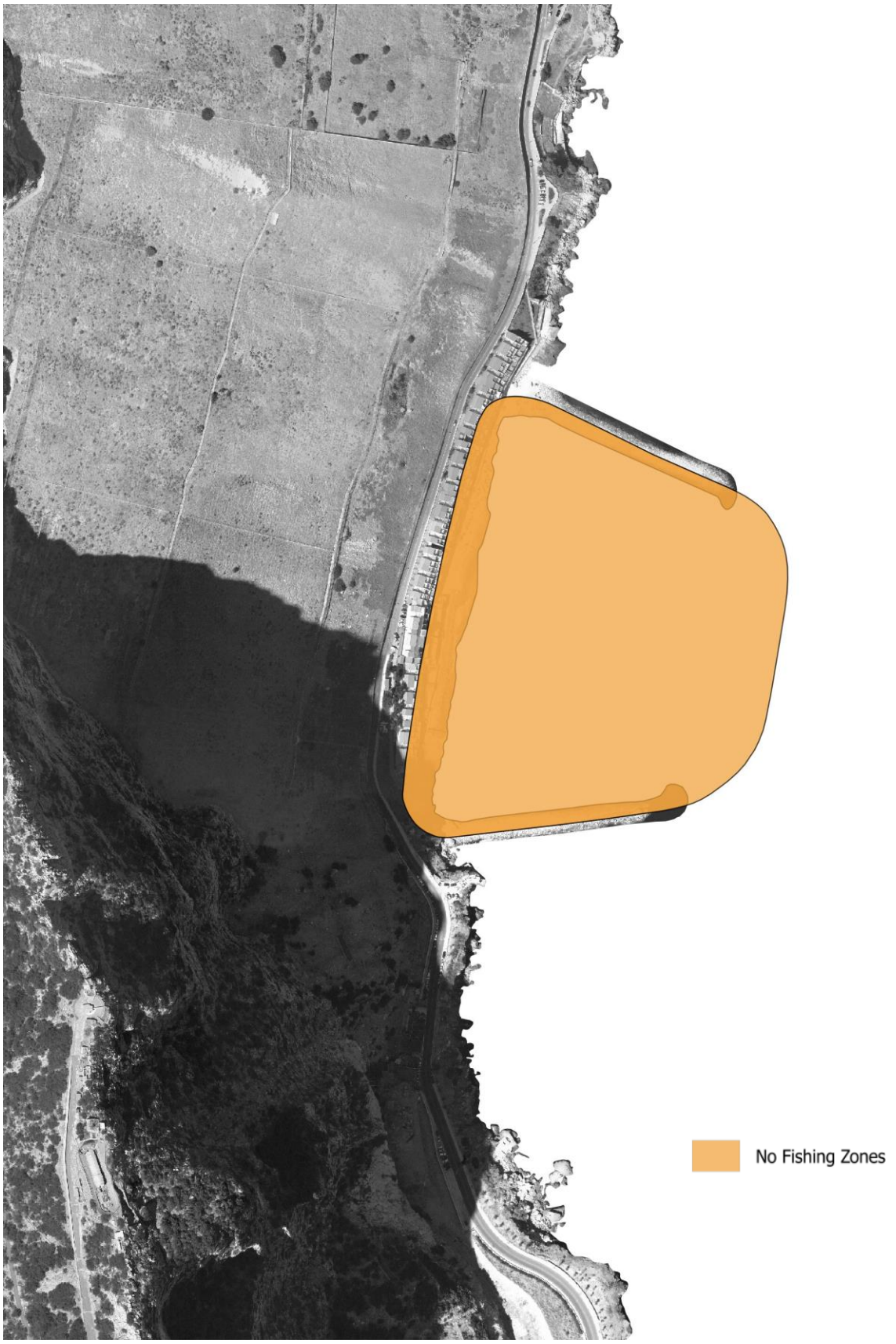


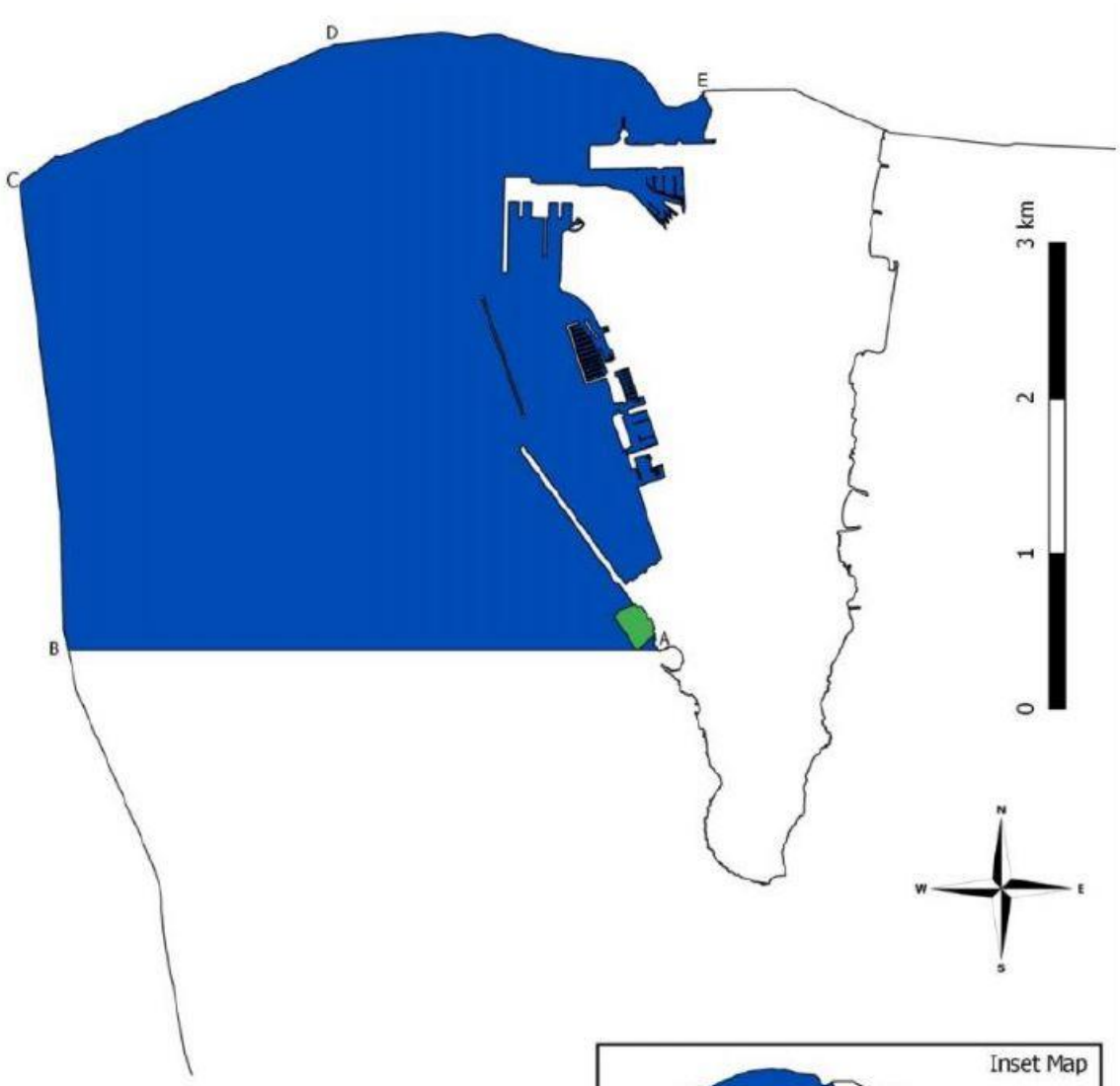
Figure 15. Sandy Bay No fishing zone.



12.4.2. Sports fishing.

	Relevant Authorities	Other Competent Authorities	Other associated organisations
Authorities associated with activity	DEHCC - EPRU	RGP GMA GPA	Fishing Working Group Recreational Fishing Clubs
Location	Throughout BGTW.		
Frequency	Regular. Dependent on weather and applicable open fishing season.		
Potential effects	• Disturbance of cetaceans. • Contamination e.g. litter and loss of fishing line and gear. • Impact on population numbers of target species.		
Ongoing management measures	• Strict licensing of sports fishing operators by the GMA and GPA in addition to the DEHCC. • Installation of Pan-Tilt-Zoom cameras to allow for the continuous surveillance of no-take and no anchoring zones. • Enforcement of Minimum Sizes included under Schedule 4 of the MPR. • Enforcement of catch limits for Species in Need of Strict Protection listed listed under Schedule 2 of the MPR and the Tuna Preservation Regulationa 2014. • Restrictions on the number of rods and hooks per angler. • Prescribed fishing seasons for target species e.g. Bluefin tuna (*Thynnus thunnus*) – 15th June to 15th October. • Prohibition on the capture of Sharks, Rays and Skates. • Enforcement of temporary bans or suspensions for specific species during open season. • Enforcement of Cetacean protocol by the DEHCC in line with the requirements of the Marine Protection Regulation 2014. • Creation and enforcement of a Dolphin Protection Zone restricting the use of specific fishing gears in the North West section of the marine reserve i.e. no 'popping'. • Implementation and enforcement of quotas. • Public awareness campaigns of sustainable fishing practices.		
Timescale	Conservation measures Implemented. Regularly reviewed by the DEHCC. Minimum review frequency – Quarterly.		

Figure 16. Dolphin Protection Zone in the North West section of the Gibraltar Marine Reserve.



Point	Latitude	Longitude
A	36.12229	-5.35418
B	36.12146	-5.39635
C	36.14837	-5.40066
D	36.15704	-5.37837
E	36.15476	-5.35182

12.4.3. Small-scale long lines.

	Relevant Authorities	Other Competent Authorities	Other associated organisations
Authorities associated with activity	DEHCC - EPRU	RGP	Fishing Working Group Recreational Fishing Clubs
Location	Throughout BGTW.		
Frequency	Regular. Weather dependent.		
Potential effects	• Contamination e.g. litter and loss of fishing line and gear. • Impact on population numbers of target species. • By-catch.		
Ongoing management measures	• Creation of no-take and no anchoring zones e.g. Seven Sisters, Mid-Harbours and Sandy Bay. • Installation of Pan-Tilt-Zoom cameras to allow for the continuous surveillance of no-take and no anchoring zones. • Licensing different classes of small-scale long lines with strict conditions such as: - Restrictions on the number of hooks and long lines per vessel; - Prohibition on the use of live baits; - 12 hour soak time limit. • Enforcement of Minimum Sizes included under Schedule 4 of the MPR. • Enforcement of catch limits for Species in Need of Strict Protection listed under Schedule 2 of the MPR. • Enforcement of temporary bans for specific species e.g. Octopus. • Prohibition on the capture of Sharks, Rays and Skates. • Enforcement of the Cetacean protocol by the DEHCC in line with the requirements of the Marine Protection Regulations 2014. • Public awareness campaigns of sustainable fishing practices.		
Timescale	Conservation measures Implemented. Regularly reviewed by the DEHCC. Minimum review frequency – Quarterly.		

13. Additional habitat-specific conservation and restoration measures:

13.1. Reefs:

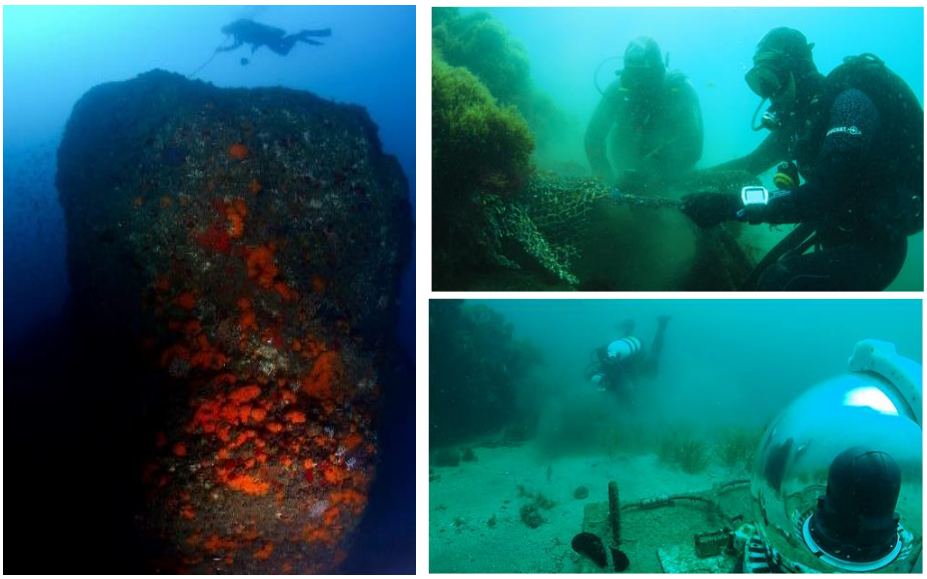
Authorities associated with activity	DEHCC

Conservation measures and review frequency

- Prohibition of the use of all forms of fishing with nets and rakes.
- Systematic high resolution side-scan sonar surveys of known reef habitats – *Every 3 to 6 years*.
- Water quality - Chemical, physico-chemical and biota (tissue) monitoring of target species – *Monthly with the exception of biota analyses (every 3 years).*
- Artificial reef creation programme – *Ad-hoc*.
- Re-introduction and re-population programme for *Zostera marina*, *Cymodecea nodosa* and *Ostrea edulis* – *Continuous*.
- Surveillance of protected reef habitat within the Seven Sisters No take Zone with underwater cameras – *Continuous.*
- Ecological surveys of midlittoral, infralittoral and deep-water rocky reef assemblages to determine conservation status – *Yearly*.
- Monitoring and assessing the frequency and severity of potential impacts of different marine activities, as detailed in section 13, on reefs (e.g. fishing, anchoring, recreational diving, invasive species and contamination) – *Yearly*.
- Underwater noise monitoring – *Continuous.*
- Marine litter surveys – *Quarterly*.
- Removal of marine litter including illegal ghost nets – *Ad-hoc*.
- Monitoring trends in background underwater noise levels – *Quarterly*.

Indicators used to measure progress in attaining conservation objectives

- Extent (km^2) and physical structure (condition) of reef habitats.
- Applicable water quality and biota Environmental Quality Standards (EQS) .
- Number/coverage, distribution and population dynamics of typical and sensitive species associated with *Good Environmental Conditions* in midlittoral, infralittoral and deep-water rocky reef assemblages.
- Number/coverage and distribution of invasive species.
- Number, frequency and severity of anthropogenic threats.



Left: Rocky reef pinnacle on the Eastside shelf. **Right (above)**: Divers from GSAC 888 removing an illegal ghost net in the reserve. **(Below)** Underwater surveillance camera installed by DEHCC showing divers carrying out *Cymodecea nodosa* re-introduction trials.

13.2. Submerged or partially submerged sea caves:

Authorities associated with activity	DEHCC

Conservation measures and review frequency

- Prohibition of the use of all forms of fishing with nets and rakes.
- Systematic high resolution side-scan sonar surveys of known habitats containing submerged sea caves – *Every 3 to 6 years*.
- Water quality – chemical and physico-chemical monitoring – *Monthly*.
- Ecological surveys of submerged and partially submerged sea caves to determine conservation status – *Yearly*.
- Monitoring and assessing the frequency and severity of potential impacts of different marine activities, as detailed in section 13, on submerged or partially submerged sea caves (e.g. fishing, anchoring, invasive species, recreational diving and contamination) – *Yearly*.
- Underwater noise monitoring – *Continuous.*
- Removal of marine litter including illegal ghost nets – *Ad-hoc*.
- Environmental education programme – *Quarterly*.
- Monitoring trends in background underwater noise levels – *Quarterly*.

Target indicators

- No decrease in extent and physical structure of submerged and partially submerged sea cave habitats.
- Applicable water quality Environmental Quality Standards (EQS) are met.
- Number/coverage, distribution and population dynamics of typical and sensitive species associated with Good environmental conditions are attained or maintained subject to natural change.
- In the case of partially submerged caves used by seabirds and bats, the breeding and roosting number of *Phalacrocorax aristotelis desmarestii*, *Ptyoprogne rupestris*, *Apus pallidus* and *Tadarida teniotis* must be maintained or improved subject to natural processes.
- Reduced number/coverage and distribution of invasive species.
- Number, frequency and severity of anthropogenic threats.

13.3. Sandbanks:

Authorities associated with activity	DEHCC

Conservation measures and review frequency

- Prohibition of the use of all forms of fishing with nets and rakes.
- Prohibiting dredging activities in the Southern Waters.
- Systematic high resolution side-scan sonar surveys to delimit sandbank habitats and depth – *Every 3 to 6 years*.
- Water quality - chemical, physico-chemical and biota (tissue) monitoring of target species – *Monthly with the exception of biota analyses (every 3 years).*
- Monitoring particle size (PSA). Parameters include percentage sand/silt/gravel, mean and median grain size, and sorting coefficient, used to characterise sediment type – *Yearly*.
- Ecological surveys of sandbanks to determine conservation status – *Yearly*.
- Monitoring and assessing the frequency and severity of potential impacts of different marine activities, as detailed in section 13, on sandbanks (e.g. fishing, invasive species and contamination) – *Yearly*.
- Underwater noise monitoring – *Continuous.*
- Removal of marine litter including illegal ghost nets – *Ad-hoc*.
- Environmental education programme – *Quarterly*.
- Monitoring trends in background underwater noise levels – *Quarterly*.

Indicators used to measure progress in attaining conservation objectives

- Extent (km^2) and physical structure (condition) of sandbanks.
- Depth distribution i.e. should not deviate significantly from established baseline, subject to natural change.
- Applicable water quality and biota Environmental Quality Standards (EQS) .
- Average PSA parameters i.e. should not deviate significantly from established baseline, subject to natural change.
- Number/coverage, distribution and population dynamics of typical and sensitive species associated with *Good Environmental Conditions*.
- Number/coverage and distribution of invasive species.
- Number, frequency and severity of anthropogenic threats.

Conservation measures in action. **Top Left**: DEHCC scientists collecting water samples for chemical analysis on the eastern shelf. **Top right**: DEHCC Scientific diver monitoring fish species abundance and diversity over sandbanks. **Centre**: MV Red Wolf with side mount multi-beam echo sounder and motion sensor delimiting listed reef habitat in the Southern Waters MCZ. **Bottom**: DEHCC Scientific diver monitoring 'Burkana' artificial reef within the Rosia MCZ.

14. Additional species conservation measures:

14.1. Loggerhead turtle *Caretta caretta*

Authorities associated with activity	DEHCC

Conservation measures and review frequency

- Prohibition of the use of all forms of fishing with nets and rakes.
- Surveillance monitoring of *Caretta caretta* abundance and distribution, including the use of satellite tagging methods, to determine conservation status – *Continuous.*
- Water quality - chemical, physico-chemical and biota (tissue) monitoring of target species – *Monthly with the exception of biota analyses (every 3 years).*
- Monitoring and assessing the frequency and severity of potential impacts of different marine activities, including fishing (e.g. bycatch), shipping (e.g. collisions) and contamination on *Caretta caretta*, as detailed in section 13 – *Continuous*.
- Underwater noise monitoring – *Continuous.*
- Monitoring *Caretta caretta* strandings including carrying out necropsies to determine causes of death where possible – *Ad hoc*.
- Removal of marine litter including illegal ghost nets – *Ad-hoc*.
- Environmental education programme – *Quarterly*.
- Citizen Science Programme to assist with the collection of data on *Caretta caretta* – *Continuous*.

Indicators used to measure progress in attaining conservation objectives

- Distribution, abundance and population dynamics of *Caretta caretta* and other marine reptiles.
- Number of *Caretta caretta* and other marine reptile strandings including type and frequency of causal factors.
- Applicable water quality and biota Environmental Quality Standards (EQS).
- Number, frequency and severity of anthropogenic threats e.g. disturbance pressure from shipping including recreational boating.

Left: EPRU officials attending to a stranding report and obtaining biometric data. **Right**: Loggerhead turtle migrating through the Southern Waters of Gibraltar during summer.

14.2. Bottlenose dolphin *Tursiops truncatus* and Annex IV listed cetaceans that are present:

Authorities associated with activity	DEHCC

Conservation measures and review frequency

- Prohibition of the use of all forms of fishing with nets and rakes.
- Surveillance monitoring of the abundance and distribution of *Tursiops truncatus, Delphinus delphis, Stenella coeruleoalba* and other cetaceans present to determine their conservation status – *Continuous.*
- Water quality - chemical, physico-chemical and biota (tissue) monitoring of target species – *Monthly with the exception of biota analyses (every 3 years).*
- Monitoring and assessing the frequency and severity of potential impacts of different marine activities, including fishing (e.g. bycatch), shipping (e.g. collisions), cetacean watching operators (e.g. disturbance) and contamination on *Tursiops truncatus, Delphinus delphis, Stenella coeruleoalba* and other cetaceans present, as detailed in section 13 – *Continuous*.
- Monitoring prey abundance.
- Underwater noise monitoring – *Continuous.*
- Monitoring strandings of *Tursiops truncatus, Delphinus delphis, Stenella coeruleoalba* and other cetaceans present including carrying out necropsies to determine causes of death where possible – *Ad hoc*.
- Removal of marine litter including illegal ghost nets – *Ad-hoc*.
- Environmental education programme – *Quarterly*.
- Citizen Science Programme to assist with the collection of data on *Tursiops truncatus, Delphinus delphis, Stenella coeruleoalba* and other cetaceans present – *Continuous*.

Indicators used to measure progress in attaining conservation objectives

- Distribution, abundance and population dynamics of *Tursiops truncatus, Delphinus delphis, Stenella coeruleoalba* and other cetaceans present.
- Number of strandings regarding *Tursiops truncatus, Delphinus delphis, Stenella coeruleoalba* and other cetaceans present including type and frequency of causal factors.
- Applicable water quality and biota Environmental Quality Standards (EQS).
- Spatial and temporal distribution patterns, age-class distribution and population densities of indicator prey species including, but not limited to, *Conger conger*, *Octopus vulagris*, *Pagellus bograveo*, *Loligo vulgaris*, *Trachurus* spp., *Cepola macrophthlama* and *Belone belone*.
- Number, frequency and severity of anthropogenic threats e.g. disturbance pressure from shipping including recreational boating and cetacean watching operators.

Excerpt of *Tursiops truncatus* photo ID catalogue being developed for the DEHCC by MMIRC to help monitor their conservation status.

14.3. Mediterranean Ribbed Limpet *Patella ferruginea*:

Authorities associated with activity	DEHCC

Conservation measures and review frequency

- Surveillance monitoring of *Patella ferruginea* sub-populations – *Continuous.*
- Designation of Artificial Micro-Marine Reserves in revetments colonised by significant numbers of *Patella ferruginea* (e.g. Sandy Bay and Mid-Harbour revetments) – *Ad hoc*.
- Implementing security measures to prevent public access to sub-populations at risk of collection.
- Installation of Pan-Tilt-Zoom cameras in selected areas to allow for the continuous surveillance of *Patella ferruginea* sub-populations.
- Water quality – chemical, physico-chemical and biota (tissue) monitoring of intertidal species – *Monthly with the exception of biota analyses (every 3 years).*
- Monitoring and assessing the frequency and severity of potential impacts (e.g. mortality) on *Patella ferruginea* sub-populations due to natural causes (e.g. invasive species) and marine activities including fishing (e.g. illegal collection), coastal development and contamination– *Continuous*.
- Environmental education programme – *Quarterly*.
- Citizen Science programme to assist with the collection of data on *Patella ferruginea* sub-populations – *Continuous*.
- Translocation programmes to augment *Patella ferruginea* sub-populations in decline – *Ad hoc.*
- Enacting relocation programmes in the event that coastal works may affect *Patella ferruginea* – *Ad hoc.*
- Requiring new coastal defence structures to provide suitable habitat for *Patella ferruginea* colonisation – *Ad hoc*.

Indicators used to measure progress in attaining conservation objectives

- Distribution, abundance and population dynamics (i.e. male:female ratios/size class, functional and genetic connectivity, reproduction and recruitment) of *Patella ferruginea*.
- Applicable water quality and biota Environmental Quality Standards (EQS) .
- Extent of suitable intertidal habitat for *Patella ferruginea*.
- Number, frequency and severity of anthropogenic threats.

Left: DEHCC scientist carrying out a survey of *Patella ferruginea* in the South Mole MCZ. **Right:** Relocation of *Patella ferruginea* from the North Mole to the Southern Waters MCZ. This measure was undertaken with the full supervison and technical guidance of DEHCC scientists using a protocol developed specifically to maximise their chances of survival.