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AMBJENTMALTA

NTM FEE

Snorkel trails

Marine Protected Area between Rdum Majjiesa and Għar Lapsi

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Underwater habitats at Golden Bay

Do **not touch or collect** any plants or animals. Some are sensitive to touch and **can also cause pain when touched**.

The area below the shore and just off it that supports seabed habitats described in the guide is indicated by the hatched area.

Beach habitat

Beaches are made up of mobile sediments, including sands, gravels, cobbles and small boulders. The beach at Golden Bay is mostly sandy, with accumulations of cobbles in places.

Several small burrowing animals, including worms, insects and crustaceans, live in burrows in the sand and in the spaces formed by adjacent cobbles.

Cobble/small boulder habitat is present at the far (southeastern) end of the predominantly sandy beach at Golden Bay.

Accumulations of cobbles support small animals which are adapted to living in an environment that is subjected to natural disturbance due to the near-continuous exposure to wave action.

Patches and banks with seagrass and seaweed are often present on the foreshore, which serve as a protective layer against beach erosion.

The cobble/small boulder habitat on the shore extends underwater, where in shallow waters (0.5m) just off the beach, the cobble/small boulder habitat overlies a sandy bottom. Small invertebrates seek refuge in the spaces between the cobbles and underneath them. Such fauna includes crustaceans and polychaetes (worms), some of which feed on the fragments of algae and plant material originating from beached seaweed and seagrass.

The following habitats are all present underwater.

Pebble/cobble/small boulder habitat

A great part of the seabed below the first stretch of shore at the shallow southeastern corner of the bay comprises accumulations with pebbles, cobbles and small boulders. Since these are easily moved around by waves, very little or no marine flora grows on their surface.

However, several small invertebrates, including gastropods (sea snails), crustaceans and polychaetes (worms) seek refuge in the spaces between the cobbles and underneath them, where they are protected from predators and exposure to strong wave action. Furthermore, the animals that live amongst the accumulations of pebbles, cobbles and small boulders, also lay their eggs there and use them as a nursery area for their young.

Accumulations with pebbles, cobbles and small boulders are present below the shore in shallow waters along Golden Bay's southeastern headmand. These serve as a habitat for several small invertebrates, including:

Top shells
Steromphala spp.

Crustacean amphipods
e.g. *Melita* sp.

Hermit crabs
e.g. *Clibanarius erythropus*

Crabs
e.g. *Xantho pilipes*

In turn, these serve as food for larger invertebrates and small fishes, and are therefore an essential part of the food web.

Shallow rocky bottom with algae

Where a rocky bottom is present in shallow waters just below the shore, several attached algae form small forests that teem with invertebrates, many of which are small (only a few millimetres long and motile), while others (e.g. anemones) are attached to the seabed. The smaller animals are not conspicuous, as they hide among the dense algal fronds, where they seek food and refuge from predators, and where they lay their eggs. A large diversity of animals characterises this habitat, including species of molluscs, crustaceans, polychaetes (worms), sea anemones and echinoderms. Fish are often noted grazing on the algae and feeding on the small invertebrates present amongst the algal fronds.

The most abundant algae on rocky bottoms include species of *Cystoseira*, which are protected

Shallow water algal forests support a high diversity of fauna of various sizes, from under 1mm to around 10cm, such as:

Crustacean amphipods
e.g. *Ampithoe* spp.

Snakelocks Anemone
Anemonia viridis

Red Mouthed Rock Shell
Stramonita haemastoma

Common Rock Urchin
Paracentrotus lividus

Diplodus annularis

Rocky bottom fish fauna

The algal forests present in shallow waters on the rocky bottom and large boulders serve as feeding and nursery grounds for several fish. Some of the smaller species hide amongst the algae to escape predators; others lie motionless under rocky ledges ready to ambush some their prey which may unwarily come close to their mouth! Fishes often swim rapidly away when approached by a swimmer. However, ones that spend most of their time lying motionless on the seabed, such as scorpionfish, are easier to approach and observe.

Other fish species that may be encountered include:

Peacock Wrasse
Symphodus tinca

Ornate Wrasse
Thalassoma pavo

Rainbow Wrasse
Coris julis

Two-Banded Bream
Diplodus vulgaris

Several fish species, including bream *Diplodus* spp. are often seen swimming in shoals

Cymodocea nodosa seagrass

Unlike algae, seagrasses are true flowering plants that have roots, stems, leaves and also produce flowers and fruit. Since they have true roots which penetrate the sediment, seagrasses can also grow on sandy bottoms, unlike most algae.

Of the five seagrasses found in the Mediterranean, three are found around the Maltese coast. These are the Lesser Neptune Grass *Cymodocea nodosa* (above), broad leaf seagrass *Halophila stipulacea* and Neptune grass , the latter being the most widespread.

The lesser Neptune grass has light green leaves that are some 4mm wide and up to 30cm long. Stands of this plant may be found in places in shallow waters where the bottom is sandy. However, being very responsive to natural changes in environmental conditions, it is sometimes absent altogether or is present in very small sparse patches.

Seagrass habitats are of high ecological and conservation value since they support a large diversity of animals, by acting as shelter areas, nursery areas and feeding grounds for many species, while the seagrass plants help to stabilise the sandy seabed and reduce strong water movement, thereby protecting beaches against coastal erosion and also absorb nutrients leaving cleaner seas.

Bare sand habitat

Most of the seabed in Golden Bay consists of sandy bottom that does not support any algae or seagrasses – hence the term ‘bare’ given to this habitat type. The ripples on the surface of the seabed result from sea currents close to the bottom.

Although one rarely sees any fauna on the sediment surface, many species of small invertebrates live within the sand in burrows or simply embedded in it, where they are safe from predators. The most abundant fauna in this habitat are small bivalve molluscs, crustaceans, and polychaete worms.

Larger animals, such as seastars and hermit crabs are occasionally seen moving slowely on the sandy seabed.

Typical fauna that live in the sediment include:

Bivalve *Tellina* sp.

Bivalve *Dosinia* sp.

Polychaete worms
Opheliidae spp.

Crustacean amphipods
e.g. *Liljeborgia dellavallei*

Mugil cephalus

Fish fauna of bare sand habitat

Fish may be seen swimming over the sandy bottom searching for food. While some scavenge what they find on the surface, others use their barbels – whisker-like organs located close to their mouth – to detect small invertebrates buried in the sand, which the fish then dig out and eat.

Several fishes associated with sandy bottoms and other sediment habitats are of high commercial importance; these include red mullet and flatfishes, which may be encountered at Golden Bay.

Typical fish species include Grey Mullet *Mugil cephalus*, and Striped Red Mullet *Mullus surmuletus*, which has a pair of barbels at the side of its mouth that are used to detect prey hiding in the sand.

Gobies
Gobius spp.

Striped Red Mullet
Mullus surmuletus

Deeper water rocky bottom with algae

Different algae require different amounts of light, while the amount of light reaching the seabed will depend on the water depth at a particular place. As a result, different species of algae occur at different depths. Several conspicuous invertebrates occur among the algae.

As in the case of algae on rocky bottom in shallow waters (0 – 3m), algal forests in deeper waters (deeper than 4m) support a high diversity of invertebrates, many of which are mobile, while others (e.g. sponges) are permanently attached to the seabed.

Looking under rocky overhangs increases the chance of detecting these animals.

Dense algal forests are present on the rocky seabed along the southeastern headland of Golden Bay. A variety of brightly coloured invertebrates may be found in waters deeper than 3m, including:

Sponges
(the grey and red patches)

Dog Worm
Hermodice carunculata

Starfish
Echinaster sepositus

Sea cucumber
Holothuria poli

Looking under rocky overhangs increases the chance of detecting these animals.

Boulder habitat

Large areas of the seabed below the shore (excluding the beaches) within the Rdum Majjiesa to Għar Lapsi Marine Protected Area, including Golden Bay, support boulder fields which are an important habitat. The boulders would have originated from the boulder scree (termed 'rdum') present on land below the cliff coast bordering the shore.

Boulders are classified as lumps of rock larger than 26cm, and vary greatly in size and shape, with some measuring several metres across. The larger boulders are similar to the rocky seabed in supporting algal habitat on their upper, lighted surface.

The snorkeler will encounter boulders of all sizes, including some very large ones, in deeper waters below the shore

along the southeastern headland of Golden Bay.

Large boulders support dense algal forests on their upper surface while the sides also support algae, together with a variety of attached invertebrates including sponges.

Fish fauna of boulder habitat

The spaces created below a boulder when it rests on other boulders or on the seabed, serve as hiding places and refuges for some fish species, while shoaling fishes are often seen swimming in their vicinity.

Where large boulders occur, the most abundant fish, usually seen swimming in shoals, are Damselfish *Chromis* (photo above), Saddled Bream *Oblada melanura* and Saupe *Sarpa salpa*.

Saddled Bream
Oblada melanura

Saupe
Sarpa salpa

On looking closely amongst the boulders and in the spaces underneath them, one may encounter individuals of:

Moray Eel
Muraena helena

Scorpionfish
Scorpaena porcus

Some fish, such as the Scorpionfish, are very well camouflaged!

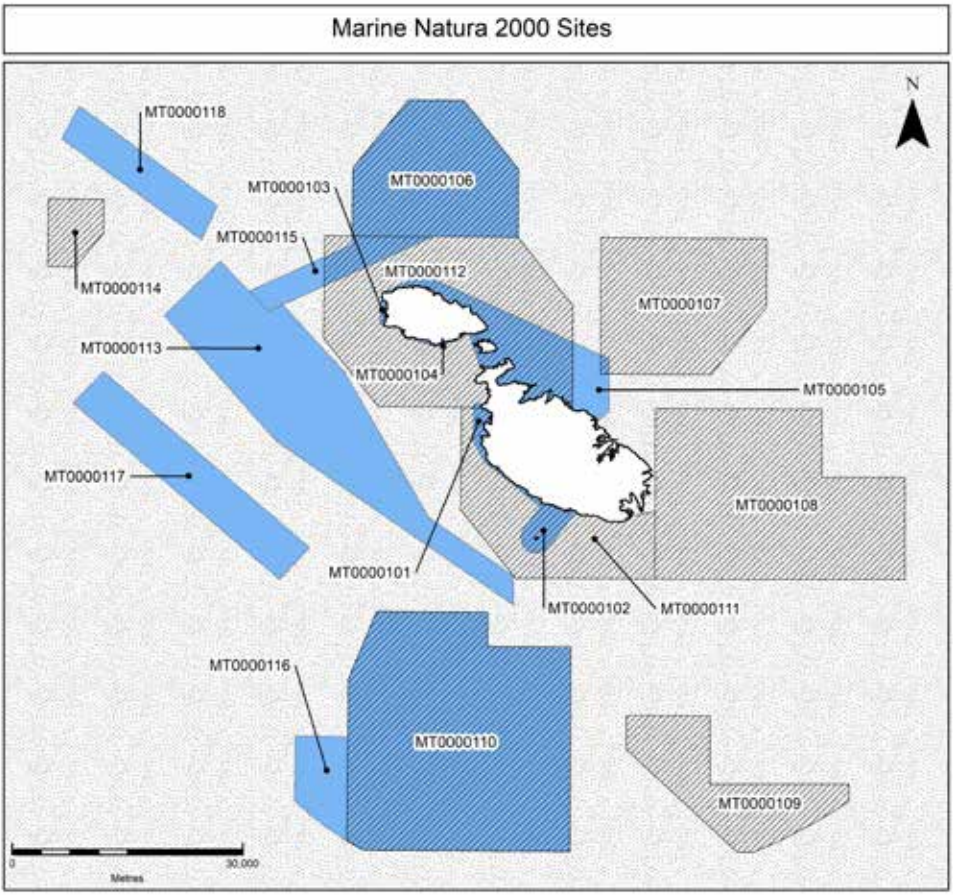
Posidonia oceanica seagrass habitat

Meadows of Neptune grass Posidonia oceanica are found in shallow waters (0 to 40m) of the Mediterranean Sea and have a very high ecological and conservation value.

Neptune grass has green leaves that can be a metre long. Where the meadows occur in very shallow waters, a square metre of seabed may support close to a thousand plants! Off the shore along the southeastern headland of Golden Bay, this seagrass is present as patches on the seabed, sometimes atop the larger boulders, and in deeper waters as dense 'meadows'.

Neptune grass habitat supports a high diversity of associated flora and fauna that are present attached to the leaves and amongst the plants within the meadow. These meadows are known as the 'lungs of the sea', because they release oxygen and act as carbon sinks.

In autumn, the seagrass sheds some of its leaves, many of which end up on the shore to form seaweed banks that comprise a different habitat for terrestrial and marine creatures and prevent sandy beaches from being eroded.



Key

Marine Special Areas of Conservation (SACs)

Marine Special Protection Areas (SPAs)

Marine Protected Areas

Marine Protected Areas (MPAs) are areas at sea that have been declared under specific legislation for the protection of key marine habitats and/or species.

Malta's marine Natura 2000 network encompasses 18 sites and covers over 4100 km^2, equivalent to more than 35% of Malta's Fisheries Management Zone The network comprises Special Areas of Conservation (SACs) designated for the protection of marine habitats and species pursuant to the EU Habitats Directive, and Special Protected Areas (SPAs) designated for the protection of seabirds under the EU Birds Directive.

The sea at Golden Bay forms part of two MPAs: the SAC MT0000101 (Żona fil-baħar bejn Rdum Majjiesa u Għar Lapsi) and the SPA MT0000111 (Żona fil-baħar fil-Ibiċ).

The SAC hosts a range of important seabed habitats, which include *Posidonia* beds, reefs, submerged or partially submerged sea caves, and sandbanks, while the SPA is important for the Scopoli's shearwater and the Yelkouan shearwater during their breeding seasons; it also contains relatively small populations of the European Storm Petrel.

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The snorkel trail in this bay was originally set up in 2013 as part of the MEDPAN NORTH project (2G-MED09-270 MEDPAN NORTH).