

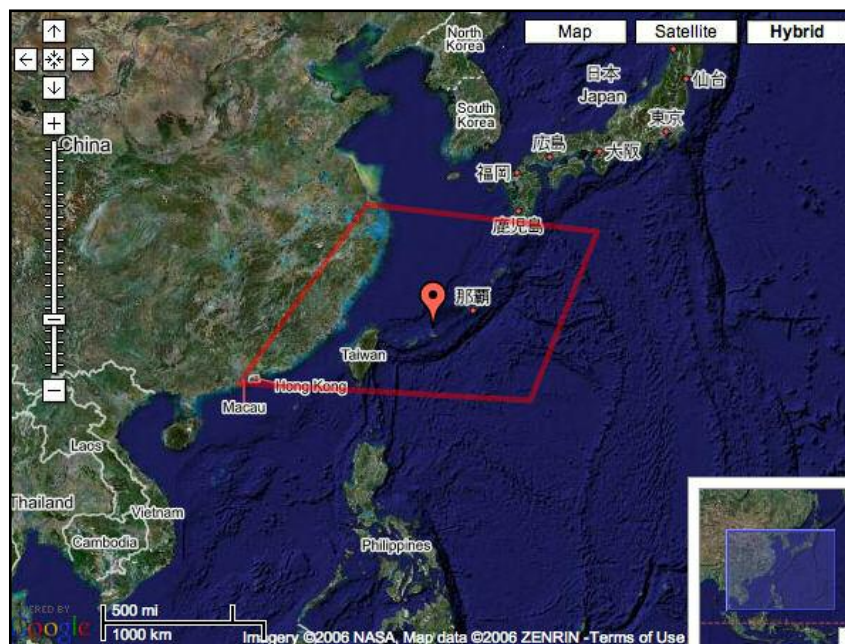


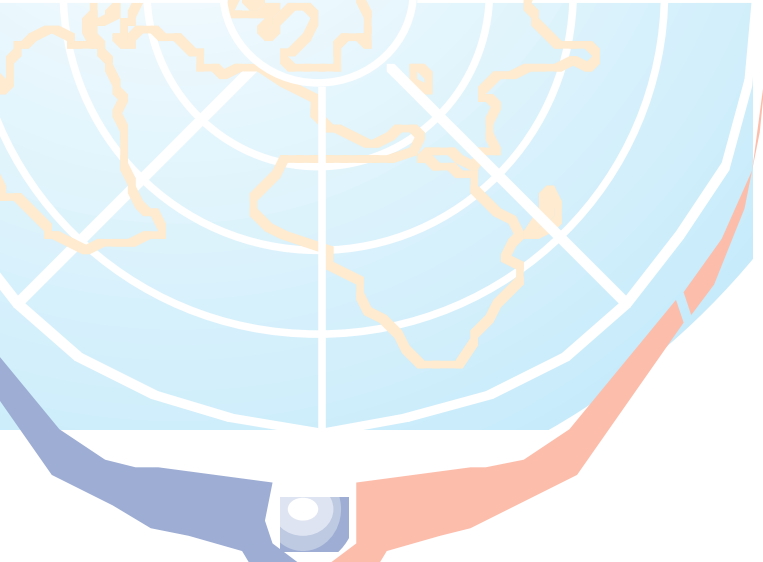
EARTHDIVE

“The health of our oceans is intrinsically linked to the future of life on this planet”

PRE-DIVE BRIEFING PACK

Eco-Region 10a
Japan/Asia - Sub-tropical





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1.0 General Information

This booklet is a **pre-dive briefing pack** for the **Japan/Asia - Sub-tropical** eco-region. Please feel free to print it and take it with you as an 'aide memoir' for your dive. It contains all the information you need to contribute to the **EARTHDIVE** Global Dive Log.

1.1 Introduction

The **EARTHDIVE** Global Dive Log is a pioneering methodology that has been developed in partnership with **UNEP-WCMC** and marine scientists from around the world. These marine scientists helped establish thirty **EARTHDIVE** eco-regions - areas of water that share a relatively similar climate and contain a common assembly of natural habitats and species. They then identified key indicator species for each region - an important set of marine animals whose numbers and changing population can tell us a lot about the changing state of our oceans.

You can help observe and record sightings of these marine animals during a dive or snorkel trip and enter observations into the **Global Dive Log**. You can also record evidence of key anthropogenic pressures - changes in the marine environment brought about by human activity such as pollution and overfishing. Any data you enter onto the **EARTHDIVE** website can be viewed by you and other visitors.

The **EARTHDIVE** eco-regions span all of the world's oceans - not just those areas with warm water and coral reefs. Whether you are diving in Scotland or Saint Lucia, Connecticut or Cocos, Denmark or Dominica, your data collection is equally valid and valuable. So you don't have to wait for the next exotic dive trip - home waters are just as important!

Each eco-region also has its own types of megafauna, from dolphins to whale sharks, from whales to polar bears (if you like really cold water) and provision is also made in the Global Dive Log to record sightings of these exciting animals.

Collecting this valuable information for **EARTHDIVE** helps create a **Global Dive Log** - a valuable research tool.

This briefing pack lists the indicator species and anthropogenic pressures for the **Mediterranean** eco-region.

Thank you for recording scientific information for **EARTHDIVE**.

1.2 How to record your observations into the Global Dive Log

When recording scientific information for **EARTHDIVE**, divers are recommended to follow our 7 Point Plan. You will find the use of a slate or some other method of taking notes underwater, such as a laminated fish identification card, invaluable. Always try to transfer your data to the **EARTHDIVE** website as soon as possible following your dive. Let dive buddies and dive leaders know what you are measuring, as they may be able to help with some post-dive questions on identification.

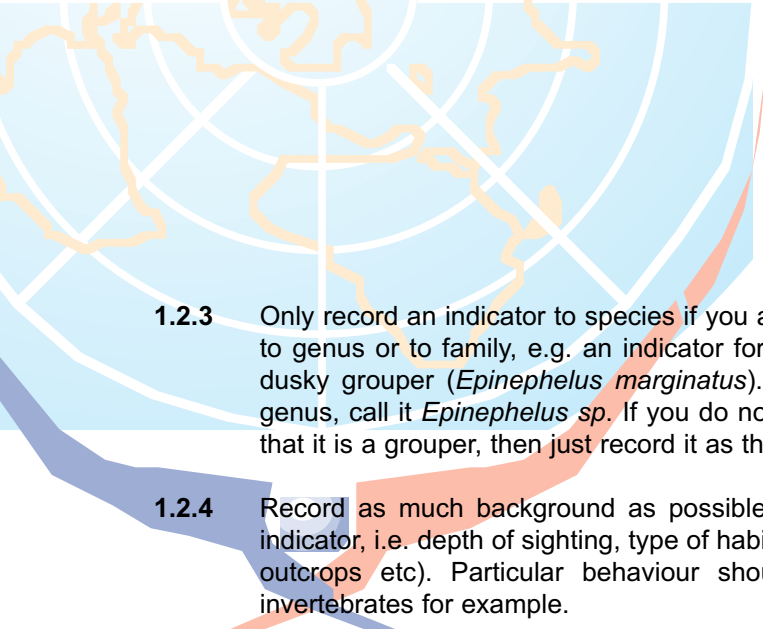
1.2.1 Try and ensure that the time of the underwater recording session is accurately noted. The length of the session can be all of the dive or just a period during the dive e.g. 10 minutes. You may even spend periods of time recording different indicators. For example there may be a dense aggregation of drums, which you count for 10 or 15 minutes. On the other hand you may look for other species such as groupers for most of the dive. Whatever your choice, the data is important so try to add the recording time in the notes for each indicator.

1.2.2 When possible always record **actual** counts of indicator species. If this is too difficult on the dive then enter your data into the abundance scale in the Global Dive Log as an estimate.



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- 1.2.3 Only record an indicator to species if you are 100% certain that it is that species. Otherwise record to genus or to family, e.g. an indicator for the sub-tropical Atlantic Coast of South America is the dusky grouper (*Epinephelus marginatus*). If you are uncertain of the species but recognise the genus, call it *Epinephelus* sp. If you do not have time to recognise it, or do not know it apart from that it is a grouper, then just record it as that - it's just as important!
 - 1.2.4 Record as much background as possible in the notes section of the Global Dive Log for each indicator, i.e. depth of sighting, type of habitat (lower reef slope, kelp bed, sand with scattered rocky outcrops etc). Particular behaviour should also be noted - spawning behaviour in fish or invertebrates for example.
 - 1.2.5 When recording always fin slowly and evenly with minimal sudden movements. Moving rapidly will disturb resident fish causing them to hide from view more quickly. By moving slowly and evenly you have more chance of seeing indicator species and recording their presence/absence more accurately. Always look carefully for particular indicators such as lobsters, which are often under overhangs or in crevices.
 - 1.2.6 On your way to and from your dive site, record any observations you have made regarding the listed anthropogenic pressures for this eco-region.
 - 1.2.7 Following your dive, make notes from your slate or memory and keep them in a safe place. Add any further comments within 24 hours before you lose some of the detail from your memory.

Thank you

2.0 The Japan/Asia - Sub-tropical Eco-Region

This eco-region comprises Taiwan, Hong Kong and Macau then northeast along the coast and waters of China's East China Sea, terminating at the point where the East China Sea meets the Yellow Sea, at the mouth of the Changjiang (Yangtze) River, just north of Shanghai. It also includes the Japanese archipelago of Ryukyu.



The marginal **East China Sea** is an arm of the western Pacific Ocean bounded by China, South Korea, Taiwan, and the Ryukyu and Kyushu islands. It has rich fishing grounds. The water depth ranges from 200 to 50 m over the continental shelf of the Sea. The marine ecosystems in the Sea are affected by the warm Tsushima Current, which originates here, and by the higher temperature and higher salinity Kuroshio Current to the south. The shallow coastal waters provide productive spawning and nursery grounds for many pelagic fish. The area is subject to seasonal typhoons and cyclones. The rapid economic development and growing population of coastal China has led to significant increases of wastewater and sewage discharge into the East China Sea. As a result, summer red tide events and toxic algal blooms are on the increase.

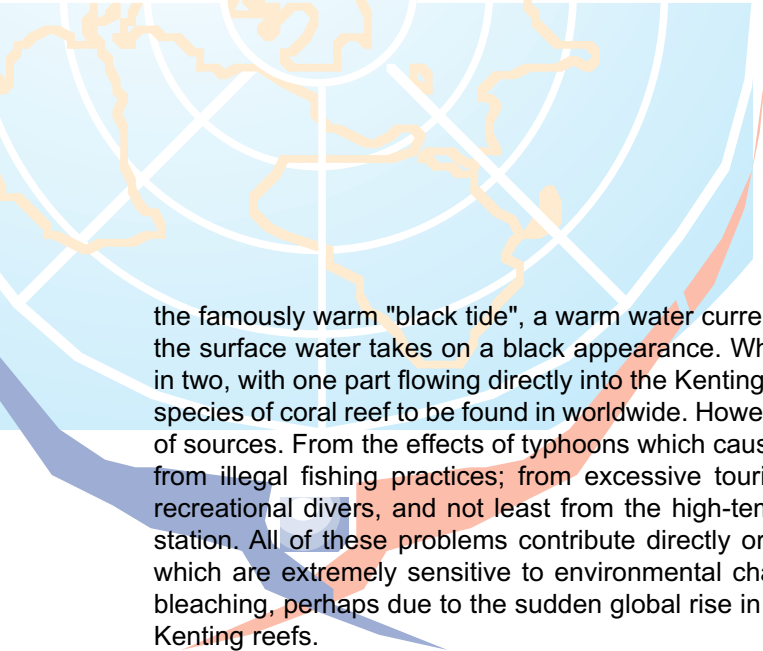
The **Nansei Shoto Islands** are an isolated chain of islands off southwestern Japan, bordering the East China Sea and the Pacific Ocean. This archipelago of exposed tops of submarine mountains is more than 1,000 km long. Because of the unusually high levels of endemism compared with other sub-tropical coral habitats, they have been called the 'Galápagos of the western Pacific'. The isolation has made it possible for unique species to evolve, and the marine ecosystems contain diverse coral reefs that support many endemic fish species and thriving populations of marine birds and mammals.

The abundance and diversity of **Taiwan's** marine resources have drawn the attention of academics, recreational divers and lovers of the ocean from every corner of the globe. Situated at the southern tip of Taiwan, The Kenting National Park experiences



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the famously warm "black tide", a warm water current that carries such a high level of marine organisms that the surface water takes on a black appearance. When the "tide" reaches the Hengchuen Peninsula, it splits in two, with one part flowing directly into the Kenting area. Kenting is home to some 60 percent of the various species of coral reef to be found in worldwide. However, the coral reefs are under serious threat from a variety of sources. From the effects of typhoons which cause mudslides and siltation; from collateral damage arising from illegal fishing practices; from excessive tourism, with four million visitors each year; from careless recreational divers, and not least from the high-temperature cooling water discharge from a nearby power station. All of these problems contribute directly or indirectly in the death of various species of coral reef, which are extremely sensitive to environmental changes. Neither has the worldwide phenomenon of coral bleaching, perhaps due to the sudden global rise in seawater temperatures between 1997 and 1998, spared Kenting reefs.

Hong Kong lies on the southern coast of China at the estuary of Pearl River. Though primarily tropical, Hong Kong is affected by the seasonal fluctuations of warm and cold waters and monsoon weather conditions that give rise to a mixture of tropical and temperate forms like corals, sea grasses, fishes and dolphins. The island is home to one of the busiest ports in the world and a large part of its coastline has been used for residential and commercial development. Fortunately, much of Hong Kong coastline and the diverse marine life still remain. However, these areas are threatened by the impacts of sewage, dredging, dumping, reclamation and other forms of threats such as destructive fishing. In an effort to retain and reclaim its natural environment, Hong Kong has created a number of Marine Parks. Designated in 1996, the parks are small but with a large degree of biodiversity. **The Hoi Ha Wan Marine Park** is home to a small mangrove community and a large variety of hard corals. **The Sha Chau and Lung Kwu Chau Marine Park** is sited in the open waters on the western side of Hong Kong. The marine ecosystems within this marine park are greatly influenced by the Pearl River freshwater run-off. It is home to a community of Chinese white dolphins (*Sousa chinensis*). **The Yan Chau Tong Marine Park** has seagrass and mangrove habitats and a rich diversity of hard corals.

3.0 Indicator Species

What to look for and record in the **Japan/Asia - Sub-tropical** Eco-region:

All Sharks

Low numbers are indicators of overfishing



Groupers - (*Serranidae*)

Low numbers are indicators of overfishing



Lobsters

Indicators are indicators of overfishing



Sea Urchins (*Echinometra spp*)

TBA



Crown of Thorns - Seastar

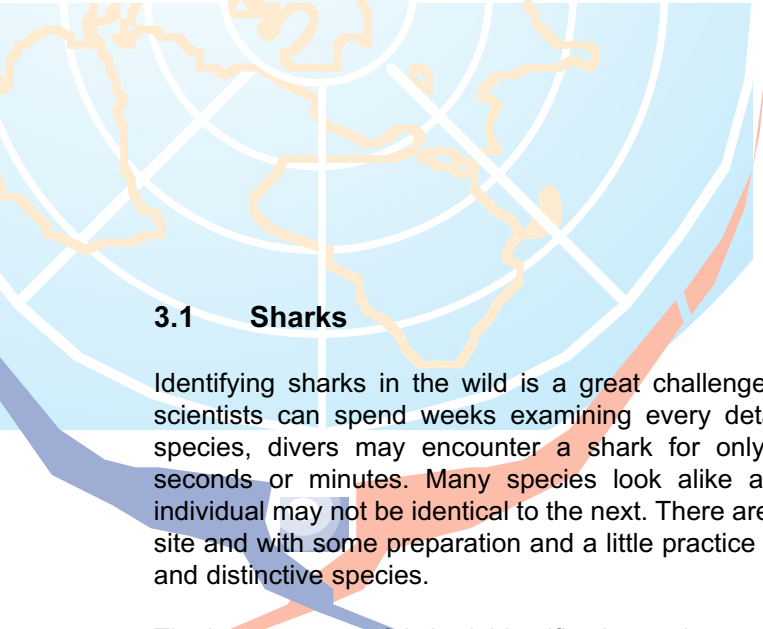
High numbers indicate potential reef mortality

Low numbers indicate overfishing



The International Union for Conservation of Nature and Natural Resources (IUCN) provides a listing of species that are at risk of global extinction. The 'IUCN Red List Categories and Criteria' are intended to be an easily and widely understood system and can be found at <http://www.redlist.org>. The general aim of the system is to provide an explicit, objective framework for the classification of the broadest range of species according to their extinction risk. If any of the indicator species for this Eco-Region have been classified as Critically Endangered, Endangered or Vulnerable on the list, then we have included that information below.





3.1 Sharks

Identifying sharks in the wild is a great challenge! While scientists can spend weeks examining every detail of a species, divers may encounter a shark for only a few seconds or minutes. Many species look alike and one individual may not be identical to the next. There are, however, relatively few species in any one specific dive site and with some preparation and a little practice it is possible for all of us to recognise the more common and distinctive species.



Tiger Shark

The key to successful shark identification underwater is a process of elimination, based on a mental checklist of the main features to look for in every animal encountered. One feature alone is rarely enough for a positive identification, so gather as much information as you can before drawing firm conclusions.

EARTHDIVE wants you to record sightings of sharks. That in itself is valuable. A total count of all species and the time duration of the count is important information in itself and you can record this data in the **Global Dive Log**.



Short Fin Mako Shark

However, identifying the actual species is even more important. If you do not recognise a species, ask your buddy, dive leader or other divers in the group, who may have seen it also. Or, record unusual features like, needle sharp teeth, incredibly long tail, diamond-shaped open mouth or a flattened hammer-shaped head. All these observations are sufficiently distinctive to help us and others make an identification. Record these details in the notes section for each indicator in the Global Dive Log.

Colour is also helpful - note the main background colours of both the upperside and underside as well as distinctive markings. The dorsal (back) fins can also tell us a lot. Do they have a broad or narrow base? Are they curved or upright? Are they falcate (sickle shaped)? Are the tips rounded or pointed? What is the background colour of the fins?

Some species have very distinctive dorsal fins - the first dorsal of the oceanic whitetip, for instance, is huge, rounded and conspicuously marked with a mottled white tip.

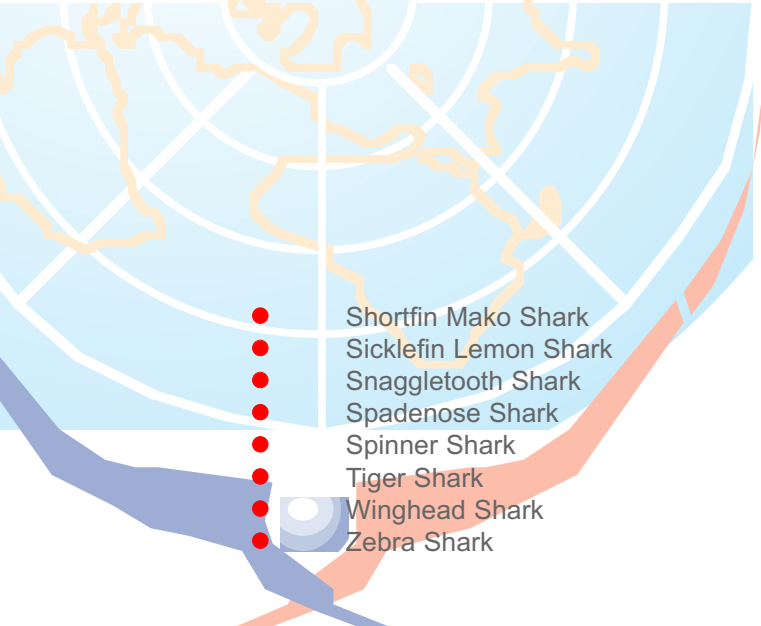
One thing we are pretty sure of (unless the **Global Snapshot** proves us wrong!), is that all sharks are restricted in their range in one way or another. Whitetip reef sharks are only found in the Pacific and Indian Oceans (including the Red Sea), for example, while bull sharks are found virtually worldwide but only in tropical and sub-tropical waters. Caribbean reef sharks occur mainly around island reefs, whereas oceanic whitetip sharks are more common farther offshore in oceanic waters.

In this way we can tell you which sharks you are most likely to encounter in the Japan/Asia - Subtropical eco-region. They are:

- Banded Houndshark
- Bigeye Thresher Shark
- Bigeye Sixgill Shark
- Bignose Shark
- Blue Shark
- Broadfin Shark
- Dusky Shark
- Japanese Sawshark
- Milk Shark
- Pelagic Thresher Shark

- Triakis scyllium*
- Alopias superciliosus*
- Hexanchus nakamurai*
- Carcharhinus altimus*
- Prionace glauca*
- Lamiopsis temmincki*
- Carcharhinus obscurus*
- Pristiophorus japonicus*
- Rhizoprionodon acutus*
- Alopias pelagicus*





- Shortfin Mako Shark
- Sicklefim Lemon Shark
- Snaggletooth Shark
- Spadenose Shark
- Spinner Shark
- Tiger Shark
- Winghead Shark
- Zebra Shark

- Isurus oxyrinchus*
- Negaprion acutidens*
- Hemipristis elongata*
- Scoliodon laticaudus*
- Carcharhinus brevipinna*
- Galeocerdo cuvier*
- Eusphyra blochii*
- Stegostoma fasciatum*



3.2 Groupers (Serranidae)

When people talk about coral reefs, fishermen tend to shrug their shoulders and complain about snagged lines and torn nets. But when you talk about groupers, they suddenly sit up and pay attention. Groupers are among the economically most important fishes of the coral reef, because of their popularity as food. Yet without the coral reef there would probably be no groupers. For this reason, groupers are an extremely important indicator species and your record of their existence or non-existence during your dive tells us a lot.

The giant grouper (*Epinephelus lanceolatus*), is the largest of all bony fishes to be found in coral reefs. It is common in shallow waters, to depths of 100m. It feeds on spiny lobsters, smaller fishes, juvenile sea turtles and crustaceans. The maximum recorded size for this species is 270 cm, the maximum published weight an incredible 400kg. Any that you encounter are bound to be smaller than this! The giant grouper has a large mouth and a rounded tail; the body is green-grey to grey-brown with faint mottling; there are numerous small black spots on the fins. Juveniles have irregular black and yellow markings. There is anecdotal but unconfirmed evidence of the giant grouper fatally

attacking humans!

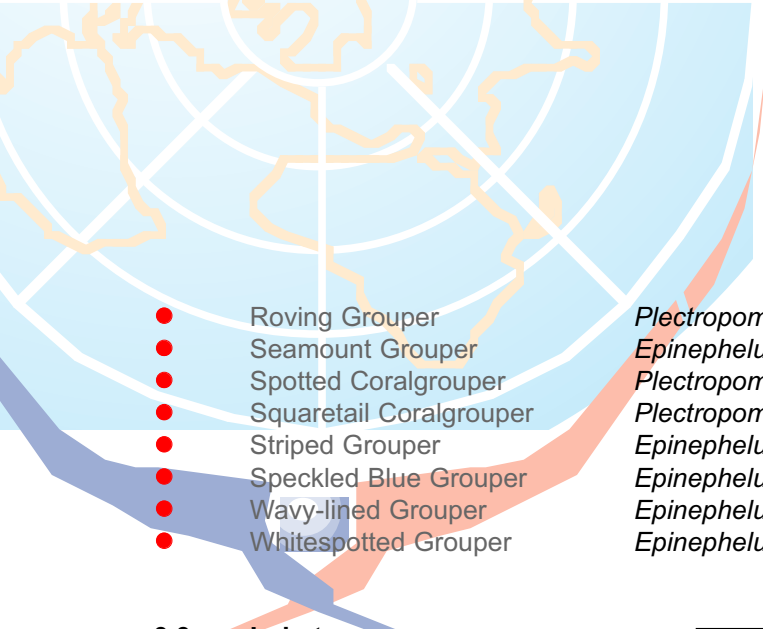
Like all indicators, it is valuable if you can record the particular species you sight. However, recording the total number of groupers is just as important. The species that you are most likely to encounter in the Japan/Asia - Sub-tropical eco-region are listed below, but given the enormous diversity of species within the eco-region, this list may not be all-inclusive:

●	Blacksaddled Coralgrouper	<i>Plectropomus laevis</i>	125cm
●	Brown-marbled Grouper	<i>Epinephelus fuscoguttatus</i>	120cm
●	Brownspeckled Grouper	<i>Epinephelus chlorostigma</i>	75cm
●	Camouflage Grouper	<i>Epinephelus polyphkadion</i>	90cm
●	Comet Grouper	<i>Epinephelus morrhua</i>	90cm
●	Convict Grouper	<i>Epinephelus septemfasciatus</i>	155cm
●	Dotted Grouper	<i>Epinephelus epistictus</i>	80cm
●	Duskytail Grouper	<i>Epinephelus bleekeri</i>	76cm
●	Eightbar Grouper	<i>Epinephelus octofasciatus</i>	130cm
●	Giant Grouper	<i>Epinephelus lanceolatus</i>	270cm
●	Greasy Grouper	<i>Epinephelus tauvina</i>	213cm
●	Highfin Coralgrouper	<i>Plectropomus oligacanthus</i>	75cm
●	Leopard Coralgrouper	<i>Plectropomus leopardus</i>	120cm
●	Longtooth Grouper	<i>Epinephelus bruneus</i>	128cm
●	Misty Grouper	<i>Epinephelus mystacinus</i>	160cm
●	Malabar Grouper	<i>Epinephelus malabaricus</i>	234cm
●	Oblique-banded Grouper	<i>Epinephelus radiatus</i>	70cm
●	Orange-spotted Grouper	<i>Epinephelus coioides</i>	120cm
●	Potato Grouper	<i>Epinephelus tukula</i>	200cm



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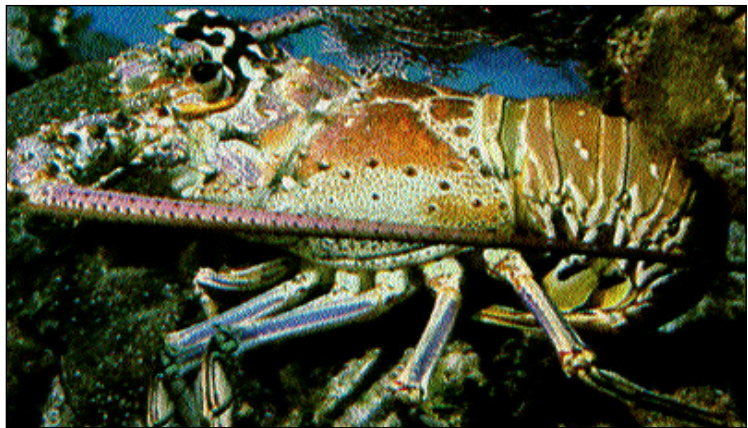


- Roving Grouper
- Seamount Grouper
- Spotted Coralgrouper
- Squaretail Coralgrouper
- Striped Grouper
- Speckled Blue Grouper
- Wavy-lined Grouper
- Whitespotted Grouper

<i>Plectropomus pessuliferus</i>	120cm
<i>Epinephelus suborbitalis</i>	118cm
<i>Plectropomus maculatus</i>	100cm
<i>Plectropomus areolatus</i>	73cm
<i>Epinephelus latifasciatus</i>	137cm
<i>Epinephelus cyanopodus</i>	122cm
<i>Epinephelus undulosus</i>	75cm
<i>Epinephelus coeruleopunctatus</i>	76cm

3.3 Lobsters

Lobsters, like shrimps and crabs, are decapods – literally meaning 10 legs - and can be found in all of the world’s tropical and sub-tropical seas as well as more temperate waters. They are predatory, nocturnal animals with a vividly decorated coat. They are often numerous locally; they linger in crevices (with their long antennae sticking out) during the day and hunt small benthic organisms at night, but they also feed on organic detritus whenever they happen across it. As with all crustaceans, the lobster moults or sheds its shell to grow.



Up until the end of the 19th century lobster was so plentiful that it was often used as fish bait. Sadly, with lobster’s ever-increasing popularity those days are now gone forever. Lobsters have recently suffered a dramatic demographic decline; intensive fishing has annihilated entire populations, especially where tourism abounds.

The lobster families that you may encounter are the spiny rock lobsters, *Palinuridae*, the slipper lobsters, *Scyllaridae* and the true reef lobsters, *Nephropidae*.

The true reef lobsters, *Nephropidae*, with their enlarged pincers on the first pair of legs are found in northern waters, and will not be seen here. The first pair of walking legs carries large but slightly unequal pincers that can be both formidable and dangerous.

The *Palinurus* genus (frequently transcribed as *Panulirus*) is represented by numerous species in all of the world’s tropical and sub-tropical seas as well as more temperate waters. It is a predatory, nocturnal animal with a vividly decorated coat.

Slipper lobsters, also known as Spanish or shovelnose lobsters, live on stony ground, in caves, and can also be found on muddy bottoms. They use the large spade-like scales at the front of the head to burrow into mud, sand or gravel between and under stones. It lacks the large claws of a true lobster, or the long antennae of spiny lobster. Instead it sports very short antennae and two large hinged scales or plates at the front of the shell. The carapace has a rough consistency

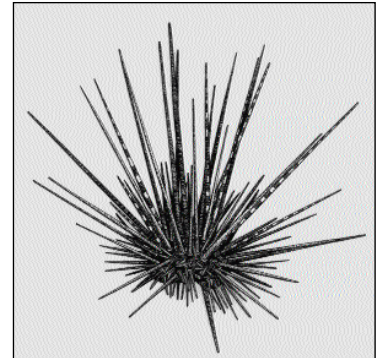
Other decapods to be found in the region are the Species of *Metanephrops*, such as the China lobster (*Metanephrops sinensis*) and the Japanese lobster (*Metanephrops japonicus*). These small members of the class, commonly called scampi elsewhere, normally inhabit very deep waters with and often burrow into the sandy or muddy bottom. They range in size from 50 – 75mm. Please do not include any *Metanephrops* in your survey.



Unsurprisingly, low numbers are indicative of overfishing.

3.4 Sea Urchins (*Echinometra spp*)

Sea urchins are often used as indicator organisms in public aquaria to determine whether the system is functioning properly. These organisms are extremely sensitive to water conditions and are first to show signs of stress, seen when their spines are laid down or are shed. Sea urchins are highly sensitive to air and direct sunlight, and often use bits of shell and pebbles as sunshade 'umbrellas'.



Sea urchins (*echinoderms*) are a group of marine invertebrates that can be found in almost every major marine habitat from the poles to the equator and from the inter-tidal zone to depths of more than 5,000 metres. There are around 800 extant species and the group has a long and detailed fossil record stretching back many millions of years. All echinoderms have tube-feet and these play a very important role in feeding and respiration. Echinoderms move by means of spines and climb and cling on to hard substrata by means of their tube-feet. The spines also offer the primary means of defence. Sea urchins feed in a variety of ways. They have a powerful internal jaw and graze on algae or sedentary organisms, thanks to a complex system of teeth known as the "lantern of Aristotle", first described by the Greek philosopher himself, over 2000 years ago.

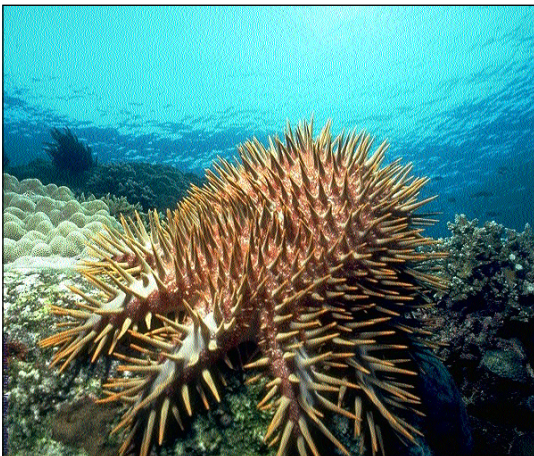
Too much algae threatens corals. If the conditions are right for algae to grow, then the algae can grow over the reef if there aren't enough algae grazers like the sea urchin to eat them. There needs to be a healthy abundance of algae eaters to keep the corals healthy.

The genus *Echinometra* is distributed throughout the tropical waters of the globe, and is the most numerous of tropical shallow-water echinoids. They are generally small bodied, with maximum sizes of 85 mm test (shell) diameter and may live 8 to 10 years. They form burrows and territories that are defended and are sometimes described as 'rock boring urchins'. The species are the most effective herbivores and in the absence of predators they can occur in densities that can cause an imbalance in the ecosystem.

Sea urchin roe is a delicacy in Japan, often served in sushi dishes (look for "uni" on the menu) and the demand has led to overfishing and a decline in numbers in some areas.

Warning! Some sea urchins are covered with sharp venom-filled spines that can easily penetrate and break off into the skin – even through a wetsuit. The DAN (Divers Alert Network) website contains useful information on how to handle the unfortunate effects of accidental brushes with these and other poisonous marine organisms. Check out www.diversalertnetwork.org for any information that you need.

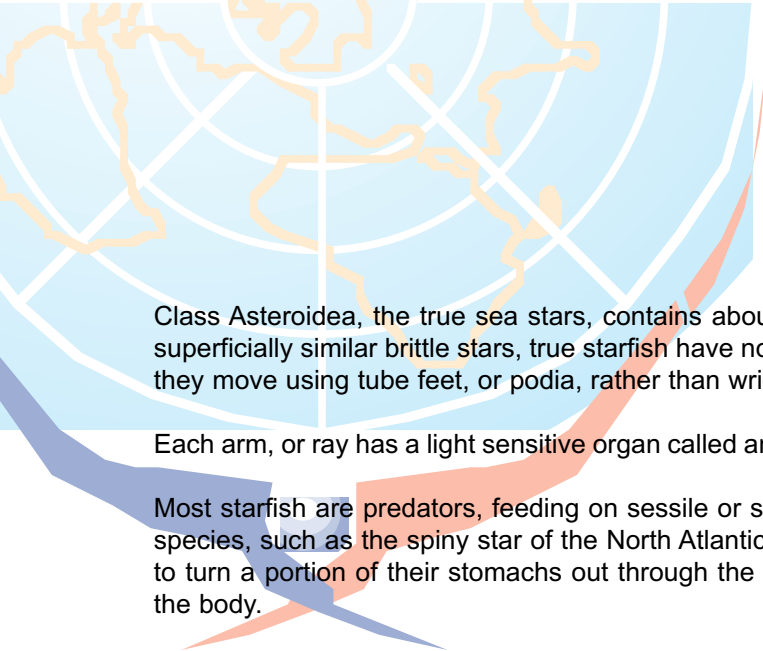
3.5 Crown of Thorns Seastar (*Acanthaster planci*)



Sea stars (group name *Stelleroidea*), are sometimes called starfish, though lacking both vertebrae and fins, they are not real fish. There are two sub-types of sea stars: *Asteroideas* are the true sea stars and sun stars, whereas *Ophiuroideas* are brittle stars and basket stars.

Ophiuroid means 'snake-like', referring to the form and motion of the arms. The arms of brittle stars are easily broken off, but will regenerate in a few days to weeks. Sea stars can also regenerate arms that are broken off, but for most species, the central region of the body must remain intact





Class Asteroidea, the true sea stars, contains about 1700 living species of these echinoderms. Unlike the superficially similar brittle stars, true starfish have no sharp demarcation between arms and central body, and they move using tube feet, or podia, rather than wriggling movements of the whole arms.

Each arm, or ray has a light sensitive organ called an eyespot, enabling it to detect light and general direction.

Most starfish are predators, feeding on sessile or slow-moving prey such as molluscs and barnacles. A few species, such as the spiny star of the North Atlantic, eat other sea stars! Many, but not all, starfish are able to turn a portion of their stomachs out through the mouth (called eversion), and thus digest food outside of the body.

This star-shaped carnivorous animal is usually a dull yellow or orange, but can also be brightly coloured. As a natural defence mechanism, the starfish is able to change its body color to hide or escape from predators. Starfish vary greatly in size from a few centimetres over one metre. The arms of the starfish are used for movement, catching prey and digestion. Unlike other animals, the starfish is able to grow a new arm if one is lost. Many starfish have five arms, but there are some deep-water species that carry more than fifty.

The crown of thorns starfish – so named because it has spiny arms radiating from a central disk that resembles a crown - is a true sea star and is the largest and probably the most poisonous sea star in the region. It grows up to 50cm in diameter and feeds on fast-growing coral polyps.

When occurring in balance within the coral habitat, it plays a central role in the lifecycle of the reef. However when populations explode, the starfish present a real threat to the reef, because it moves to feed on all types of coral when it has exhausted stocks of its preferred species – fast growing staghorn and plate corals. A single starfish can devour as much as 50 square cm of coral a day. Outbreaks of these starfish have been recorded in the region particularly in the Ryukyu islands.

The crown-of-thorns starfish is sinister yet beautiful in appearance, being covered by a large number of 4-5 cm long, very sharp spines which can produce a toxic and inflammatory reaction if touched. This starfish is multi-coloured and ranges in colour from purplish-blue with red tipped spines to green with yellow-tipped spines. Their colour may change somewhat depending on diet and the degree to which hair-like projections (papulae) extend from the skin.

The crown-of-thorns starfish prefers to live in more sheltered areas such as lagoons, and in deeper water along reef fronts.


4.0 Anthropogenic Pressures

EARTHDIVE is recording five different types of anthropogenic pressures (effects resulting from the actions of humans). Collection of this data enables us to establish an ever-evolving **Global Snapshot** of our oceans.

The types of anthropogenic pressures are the same for each region and are:

- Surface Impacts paper, wood, plastic and any other man-made debris
- Boat Activity pleasure, fishing, commercial
- Subsurface Impacts litter, sediment, physical damage
- Evidence of Fishing pots, traps, discarded nets, blast damage, cyanide damage, other etc.
- Coastal Development resorts, villages, towns, distance from the dive sites etc.





Please note any information you feel is relevant and record the data in the notes section for each impact in the Global Dive Log.

Thank you.

5.0 eCORD

EARTHDIVE asks all of its members to subscribe to the principles of **eCORD** - the **EARTHDIVE** Code of Responsible Diving - and to encourage others to practice them. **eCORD** is a straightforward 7 Point Plan which will help divers to limit the anthropogenic impact of recreational diving - while at the same time making their diving experiences more rewarding and enjoyable. Be sure to incorporate the 7 points in your dive planning!

1. Know your limits.

Every dive is different and every diver is different. Always ensure that you dive within the limits of your training and experience, whilst taking due account of the prevailing conditions. Take the opportunity to advance and extend your skills whenever that opportunity arises. In particular, buoyancy skills can become a little rusty after any prolonged absence from the water. If you can't get pool or confined water practice before your trip, get your buoyancy control checked out by a qualified instructor on your first dive! There are many national and international dive training organisations which offer a comprehensive range of courses and instructional material beyond basic skills level. Take advantage of them!

2. Be aware of the marine environment and dive with care.

Not surprisingly, many dive sites are located where the reefs and walls play host to the most beautiful corals, sponges and fish - fragile aquatic ecosystems! Starting with your point of entry, be aware of your surroundings: never enter the water where there are living corals, water plants or reeds. Once underwater, it only takes one unguarded moment - a careless kick with a fin, an outstretched hand, a dragging gauge or octopus - to destroy part of this fragile ecosystem. Even fin kicks too close to the reef or sand can have an adverse effect - so dive with the utmost care. Photographers in particular need to take greater care as they strive for that best-yet shot! Don't let your dive become an adverse anthropogenic impact! And remember that these rules apply just as much to 'hard' dive sites - such as wrecks, which have become the home of diverse marine life - as well as fresh-water and other sites.

3. Understand and respect marine flora and fauna.

A large part of the joy of diving is in learning more about the plants and animals who live in this unique underwater environment. In order to survive and thrive, many living creatures disguise themselves to look like plants and inanimate objects, or develop defence mechanisms such as stings. Some even do both! (Have you seen a stonefish lately?) The **EARTHDIVE** briefing packs (available to members only) provide information about indicator species for the region in which you are planning to dive. In addition, dive training organisations run marine naturalist and identification courses. The more that you learn, the more that you will see, the more that you will derive pleasure from your underwater experience - and the safer you will be for yourself, other divers and the marine environment!

4. Don't interfere.

First and foremost, be an observer in the underwater environment. As a general rule, look don't touch. Remember that polyps can be destroyed by even the gentlest contact. Never stand on coral even if it looks solid and robust.

Always resist the temptation to feed fish and discourage others from doing so. You may interfere with their normal feeding habits, damage their health and encourage aggressive behaviour. Leave only your bubbles!

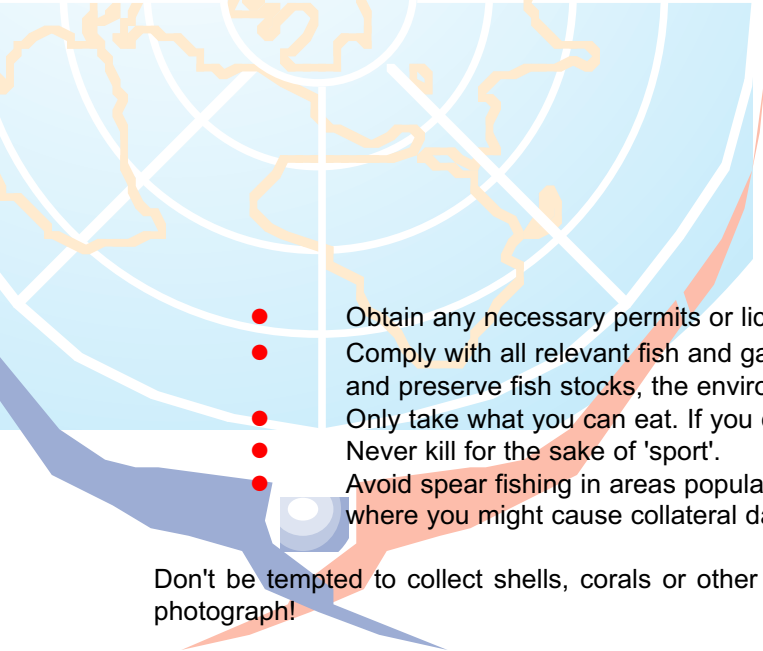
5. Take only what you need.

The marine environment is a valuable source of food for mankind and it is important that it remains so into the future. If you are among those divers who enjoy taking food from the sea, observe some simple rules:



EARTHDIVE



- 
- Obtain any necessary permits or licenses.
 - Comply with all relevant fish and game regulations. These are designed to protect and preserve fish stocks, the environment and other users.
 - Only take what you can eat. If you catch it and can't eat it, put it back.
 - Never kill for the sake of 'sport'.
 - Avoid spear fishing in areas populated by other divers or visitors to the area, or where you might cause collateral damage.

Don't be tempted to collect shells, corals or other mementos of your dive. If you want a souvenir, take a photograph!

6. Observe and report.

As an **EARTHDIVE** member, you will be in a unique position to monitor and report on the health, biodiversity and any obvious damage to dive sites using the **EARTHDIVE** Global Dive Log. In addition, we would encourage you to report anything unusual to the appropriate local marine and environmental authorities, or if this is difficult, get your dive centre to do it for you. They have a vested interest in a healthy marine environment, and will normally be more than willing to help. Always be on the lookout for physical damage, fish stock depletion, pollution and other environmental disturbances. If the dive operation itself is causing damage -say by anchoring to the reef - then let them know how you feel in no uncertain terms!

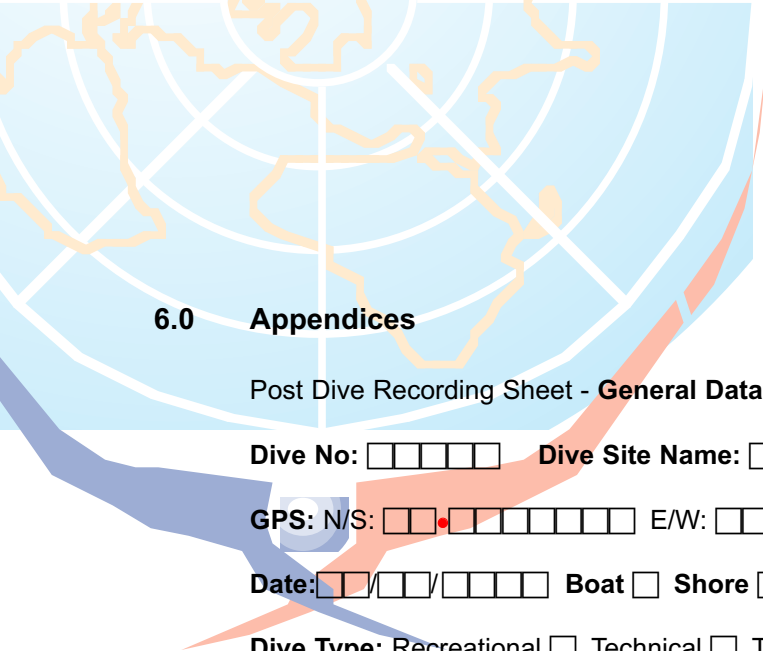
7. Get involved.

No matter where you are diving or snorkelling, be it at home or abroad, there will be at least one (and often many more) marine conservation bodies who are active in the area. Don't be afraid to approach them for information, to offer help, or just to find out what they have to offer. You will receive an enthusiastic welcome! They will provide you with lots of opportunities to contribute to marine conservation.



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6.0 Appendices

Post Dive Recording Sheet - **General Data** (complete/add/delete/tick as applicable)

Dive No: Dive Site Name:

GPS: N/S: E/W: (Decimal Degrees up to 7 decimal points)

Date: / / Boat Shore Water Type: Salt /Brackish /Fresh

Dive Type: Recreational Technical Training Drift Search Wreck Drift Night Other

Time In: : Time Out: : (24 hour clock) Dive Time: : (hr:mins)

Air/Nitrox Start: End: (psi or bar) Max Depth (ft/m)

Visibility: ft/m Temperatures: water: °C / °F air: °C / °F

Current: None Light Medium Strong (tick)


Surface Conditions: Cloudy Sunny Partly Cloudy Rain Variable other

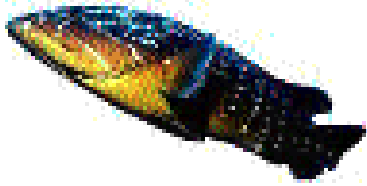
IF DIVING WITH A CLUB/DIVE CENTRE/LIVEBOARD OR RESORT, WERE YOU GIVEN AN ENVIRONMENTAL BRIEFING: YES NO

Please record any other information you normally record immediately following a dive. Add this data to the **earthdive** website via your control panel as soon as possible. **Thank you**

Post Dive Recording Sheet - **Indicator Species**

Important Note: If you allocated some time to looking for one of the indicator species, but didn't find any, please make sure that you record a **0 (zero)** count in the appropriate box, and record how much time you spent looking for the indicator.

	All Sharks
	How many Sharks did you see? (tick box and/or record actual number)
	0 <input type="checkbox"/> 1 - 5 <input type="checkbox"/> 6 - 20 <input type="checkbox"/> 20 - 50 <input type="checkbox"/> 51 - 250 <input type="checkbox"/> >250 <input type="checkbox"/>
	Actual Number <input type="text"/> <input type="text"/> <input type="text"/> (write actual number)
	How long were you looking for this indicator? <input type="text"/> (minutes)
	Add your additional information here. In what type of habitat did you see this indicator? Can you record its species? What was it doing? At what depth did you see it/them?
Additional Information:	
<div style="border: 1px solid black; background-color: #f0f0f0; width: 100%; height: 100%;"></div>	



All Groupers (*Serranidae*)

How many Groupers did you see? (tick box and/or record actual number)

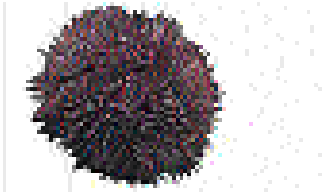
0 1 - 5 6 - 20 20 - 50 51 - 250 >250

Actual Number (write actual number)

How long were you looking for this indicator? (minutes)

Add your additional information here. In what type of habitat did you see this indicator? Can you record its species? What was it doing? At what depth did you see it/them?

Additional Information:



Sea Urchins (*Echinometra spp*)

How many Sea Urchins did you see? (tick box and/or record actual number)

0 1 - 5 6 - 20 20 - 50 51 - 250 >250

Actual Number (write actual number)

How long were you looking for this indicator? (minutes)

Add your additional information here. In what type of habitat did you see this indicator? Can you record its species? What was it doing? At what depth did you see it/them?

Additional Information:





Crown of Thorns Seastar (*Acanthaster planci*)

How many Crown of Thorns did you see? (tick box and/or record actual number)

0 1 - 5 6 - 20 20 - 50 51 - 250 >250

Actual Number (write actual number)

How long were you looking for this indicator? (minutes)

Add your additional information here. In what type of habitat did you see this indicator? What was it doing? At what depth did you see it/them?

Additional Information:



Lobsters

How many Lobsters did you see? (tick box and/or record actual number)

0 1 - 5 6 - 20 20 - 50 51 - 250 >250

Actual Number (write actual number)

How long were you looking for this indicator? (minutes)

Add your additional information here. In what type of habitat did you see this indicator? Can you record its species? What was it doing? At what depth did you see it/them?

Additional Information:



Post Dive Recording Sheet - **Anthropogenic Pressures**



Surface Impacts

Did you see any Surface Litter? (tick box)

Yes No Dont Know

If yes please record any details (plastic, wood, paper, other etc.) Please record quantity and any other relevant information.



Boat Activity

Did you see any Boat Activity? (tick box)

Yes No Dont Know

If yes please record any details (i.e fishing boats, pleasure boats, commercial vessels any other etc)

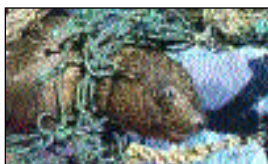


Subsurface Impacts

Did you see any Surface Litter? (tick box)

Yes No Dont Know

If yes please record any details (litter, sediment, physical damage, coral bleaching other etc).



Evidence of Fishing

Did you see any Surface Litter? (tick box)

Yes No Dont Know

If yes please record any details (pots, traps, discarded nets, blast damage, cyanide damage, other etc).



Evidence of Coastal Development

Did you see any evidence of Coastal Development? (tick box)

Yes No Dont Know

If yes please record any details (resorts, villages, towns, distance form the dives site etc).

Evidence of the illegal trade in endangered species

Any observations you make below and record in the Global Dive Log will be passed onto **TRAFFIC**, the world's wildlife trade monitoring network.

TRAFFIC works to ensure that the trade in wild plants and animals is not a threat to the conservation of nature. It has offices covering most parts of the world and works in close co-operation with the Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). **TRAFFIC** is a joint programme of WWF and IUCN-The World Conservation Union.

Evidence of the illegal trade in endangered species

Did you find any evidence at any time during your holiday/dive trip of the illegal trade of endangered species. (tick box)

Yes No Dont Know


© Elizabeth Fleming
Turtle shell ornaments on display

If yes please record any details (the species, sale location, and any other available information). Please refer to the **TRAFFIC** Guide for more information concerning species identification, local laws, and contact information of **TRAFFIC** to report offences.

TRAFFIC

