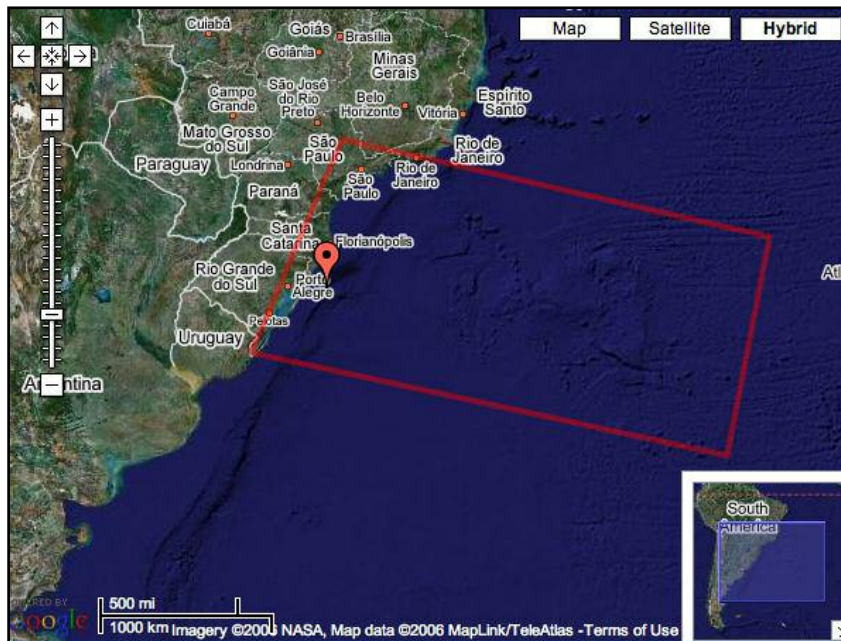


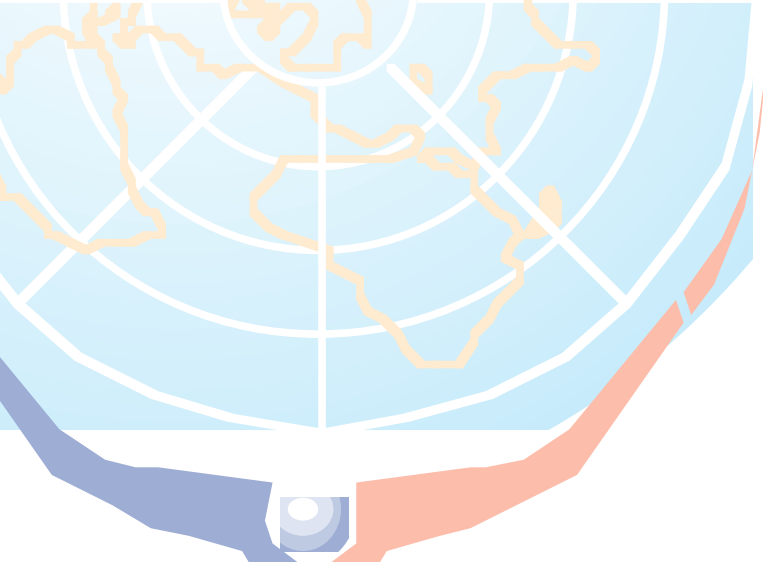


# EARTHDIVE

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

## **PRE-DIVE BRIEFING PACK** **Eco-Region 1b** **South America - Atlantic Coast - Sub-tropical**





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## 1.0 General Information

This booklet is a **pre-dive briefing pack** for the **South America - Atlantic Coast - 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 scientists helped establish thirty specific **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**.

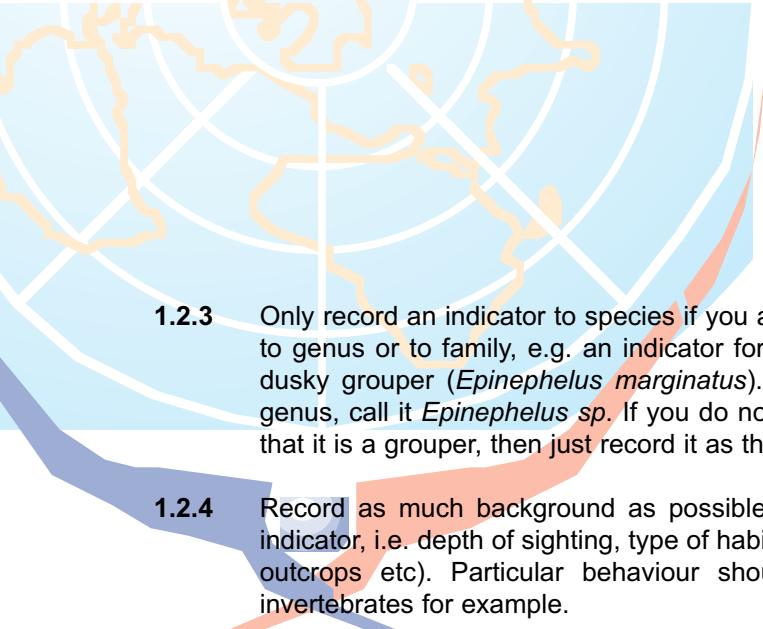
## 1.2 How to record your observations into the Global Dive Log

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.



- 
- 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 South America - Atlantic Coast - Subtropical Eco-Region**

This eco-region comprises the coastal waters of the southerly Brazilian states (estados) of Parana, Rio Grande Do Sul, Santa Catarina and Sao Paulo. Brazil's continental shelf shows a variety of widths, being wider in the north of the country and becoming narrower in the north east, the south east and the south.



The warm Brazil Current flows in a south westerly direction along the coast of Brazil from about latitude 10°S to the Río de La Plata, which forms an important biogeographical barrier between the cold Falkland (Malvinas) Current and the warm Brazil Current.

The northward extent of the Falkland Current is variable; generally reaching the latitude of the province of Buenos Aires in Argentina, but its influence can be felt as far north as Rio de Janeiro. Highly productive areas occur where there is mixing of inshore and deeper northbound drifts of water with those of the southward-moving warm Brazilian Current. The Brazil Current is strongest off Brazil, from Abrolhos Archipelago to the latitude of Rio de Janeiro. South from the tropic of Capricorn, it becomes progressively weaker. Tides along the Brazilian coast are generally weak, growing in amplitude from south to north, from approximately 2 metres around Cabo Frio (Rio de Janeiro State) to a maximum of 12 metres in the Amazon estuary.

Brazil has one of the most extensive river systems in the world, with eight major drainage basins. There are a number of important estuaries in the region in addition to some unique ecosystems, including mangroves and dunes.



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### 3.0 Indicator Species

What to look for and record in the **The South America - Atlantic Coast - Subtropical Eco Region:**

All Sharks

*Low numbers are indicators of overfishing*



Groupers - Serranidae (*Epinephelus marginatus*, *E. itajara* and *Mycteroperca acutirostris*)

*Low numbers are indicators of overfishing*



All Reef Lobsters (especially Spiny Lobster *Palinurus argus*)

*Low numbers are indicators of overfishing*



Black Sea Urchin (*Echinometra lucunter*)

*Low numbers are indicators of overfishing and poor water quality*



Snappers (Lutjanus spp.)

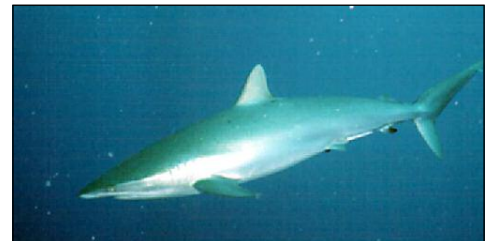
*Low numbers are indicators of overfishing*



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.



Silky 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 your **Global Dive Log**.

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 your 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?



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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 Subtropical 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 might encounter in the South America – Atlantic Coast - Subtropical eco-region and some of these are listed below, but given the enormous diversity of species within the region, this list is not all-inclusive:

- Atlantic sharpnose shark
- Basking Shark (Vulnerable –IUCN)
- Bignose Shark
- Blacknose shark
- Blacktip Shark
- Blue Shark
- Bluntnose sixgill shark
- Bonnethead shark
- Bull Shark
- Caribbean reef shark
- Copper Shark
- Dusky shark
- Finetooth Shark
- Great White Shark (Vulnerable - IUCN)
- Lemon shark
- Night shark
- Nurse Shark
- Oceanic Whitetip Shark
- Porbeagle shark
- Sandbar shark
- Scalloped Hammerhead Shark
- Shortfin mako shark
- Silky Shark
- Smalltail Shark
- Smalltooth sawfish shark (Endangered)
- Smooth Hammerhead Shark
- Spinner Shark
- Thintail thresher shark
- Tiger Shark
- *Rhizoprionodon terraenovae*
- *Cetorhinus maximus*
- *Carcharhinus altimus*
- *Carcharhinus acronotus*
- *Carcharhinus limbatus*
- *Prionace glauca*
- *Hexanchus griseus*
- *Sphyrna tiburo*
- *Carcharhinus leucas*
- *Carcharhinus perezii*
- *Carcharhinus brachyurus*
- *Carcharhinus obscurus*
- *Carcharhinus isodon*
- *Carcharodon carcharias* (sparse distribution)
- *Negaprion brevirostris*
- *Carcharhinus signatus*
- *Ginglymostoma cirratum*
- *Carcharhinus longimanus*
- *Lamna nasus*
- *Carcharhinus plumbeus*
- *Sphyrna lewini*
- *Isurus oxyrinchus*
- *Carcharhinus falciformis*
- *Carcharhinus porosus*
- *Pristis pectinata*
- *Sphyrna zygaena*
- *Carcharhinus brevipinna*
- *Alopias vulpinus*
- *Galeocerdo cuvier*



### 3.2 Groupers - Serranidae (*Epinephelus marginatus* E. itajara and *Mycteroperca acutirostris*)

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





Dusky Grouper

existence or non-existence during your dive tells us a lot.

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 we would most like you to record are listed below for the South America – Atlantic Coast - Subtropical eco-region.

The Dusky Grouper (*Epinephelus marginatus*) is solitary and territorial, with a preference for rocky bottoms. It feeds on reef fishes, crabs and octopi and can grow up to 150cm. It has a sturdy, stocky body, with very rounded dorsal and ventral profiles and large head.

The Goliath Grouper (*Epinephelus itajara*), sometimes called the Jewfish, is classified as critically endangered on the IUCN Red List. Found in shallow, inshore waters to depths of 45m, this indicator prefers areas of rock, coral, and mud bottoms. It is also solitary and territorial and feeds on crustaceans. As the largest member of the Sea Bass family in the Atlantic Ocean, it can reach lengths of 2.5m and weigh up to 450kg. There is anecdotal evidence of Goliaths stalking and attempting to eat divers!

The Comb Grouper (*Mycteroperca acutirostris*) is found on prominent rocky bottoms at 3 - 40m. There is limited information on its feeding habits, but it probably feeds on plankton. It can weigh up to 10kg, with a maximum length of 80cm. The Comb Grouper is a popular gamefish in southern Brazil for both spearfishermen and rod-and-reel anglers.

### 3.3 All Reef Lobsters (especially Spiny Lobster *Palinurus argus*)

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. 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. Lobsters have recently suffered a dramatic demographic decline; intensive fishing has annihilated entire populations, especially where tourism abounds. Please record all sightings of lobsters, identifying individual species where possible. However, we would particularly appreciate your observations on the Spiny Lobster (*Palinurus argus*).



The Spiny Lobster (*Palinurus argus*) has a number of common names, including crawfish (this is not the freshwater crawfish) and Florida lobster. It has numerous spines on the body, two large hooked horns over the eyes, a pair of long jointed antennae and five pairs of walking legs. The body and tail markings are a mottled colouring of yellow, brown, orange and blue. The tail is segmented and can be rapidly curled under the body to propel the lobster backwards. As with all crustaceans, the Spiny Lobster moults or sheds its shell to grow. It feeds on clams, snails, seaweed and small marine organisms. A very popular and marketable food source, Spiny Lobsters are harvested using special traps at depths of 2 to 50 metres and are usually landed live.

### 3.4 Black Sea Urchin (*Echinometra lucunter*)

Sea urchins are often used as indicator organisms in public aquariums 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.

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](http://www.diversalertnetwork.org) for any information that you need.





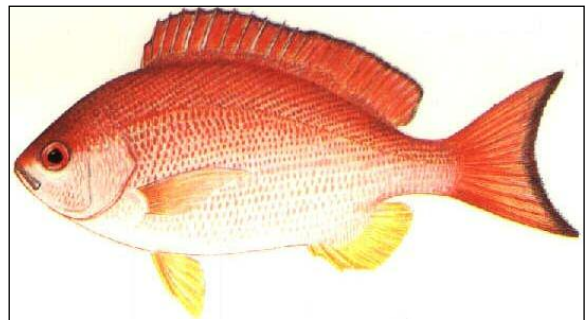
Sea urchins (echinoderms) are a group of marine invertebrates that can be found in almost every major marine habitat from the poles to the equator and from the inter-tidal zone to depths of more than 5,000 metres. There are around 800 extant species and the group has a long and detailed fossil record 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.

The Black Sea Urchin grows to a diameter of 2 inches, and ranges in colour from red to brown and black. It has large, sharp spines about 3/4 inch long. This urchin can be found in burrows in the rocks that are created by the scraping action of its teeth.

### 3.5 Snappers (*Lutjanus spp.*)

The snappers are a large and diverse group of robust-bodied, carnivorous fishes. Most species possess relatively large mouths with stout canine teeth and bodies covered with relatively large, coarse scales. They are frequently brightly coloured. They are demersal (spending most time swimming close to the sea bed) in some cases down to 450m and are found in the tropical and sub tropical waters of the Atlantic, Indian and Pacific Oceans.



There are over one hundred individual species globally, but within the Pacific Coast Sub-tropical eco region there are only a limited number of species that you are likely to see at diving depth, and these will tend to be in the warmer waters of the region. Some of the species that you may encounter in the warmer waters of Chile and north to Central America are listed below.

*Note: Many species of fish and plants are known by different names in different locations. Where appropriate, we provide the recognised scientific name, but in the case of common names, for the sake of consistency, we have used the common names as they appear in the fishbase.org database as our default name.*

## 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:

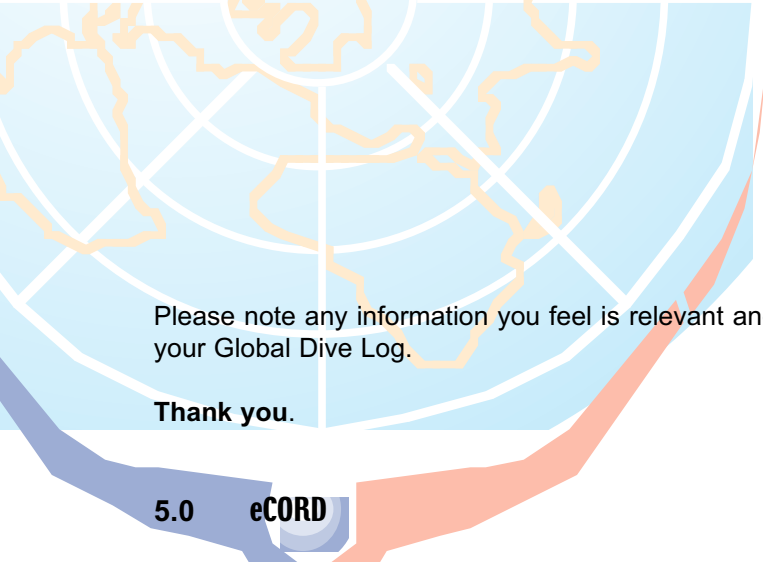
- Surface Pressures      paper, wood, plastic and any other man-made debris
- Boat Activity            pleasure, fishing, commercial
- Subsurface Pressures   litter, sediment, physical damage
- Evidence of Fishing     pots, traps, discarded nets, blast damage, cyanide damage, other etc
- Coastal Development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



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

Thank you.

## 5.0 eCORD

**EARTHDIVE** asks all scuba divers 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 by download 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!

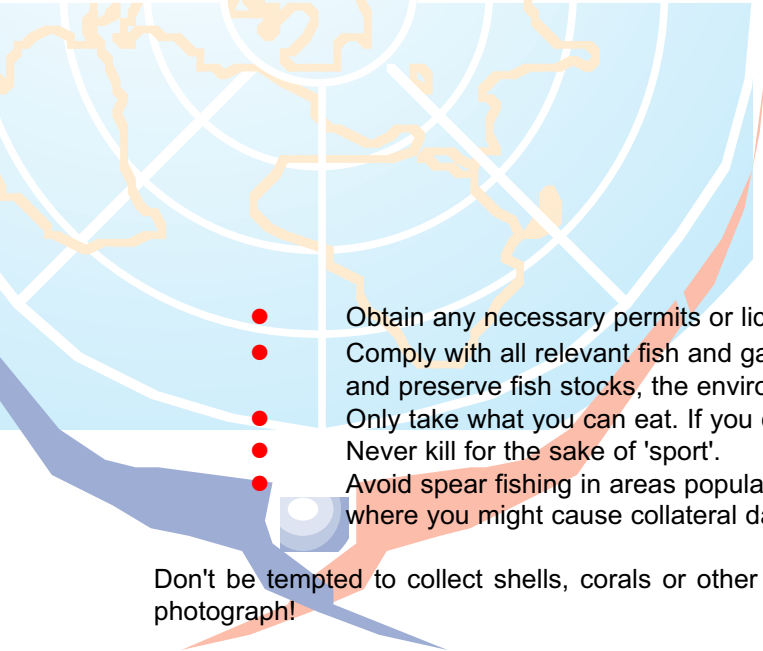
### 5. Take only what you need.

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:



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- 
- 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.

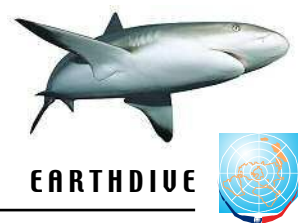
Don't be tempted to collect shells, corals or other mementos of your dive. If you want a souvenir, take a photograph!

### **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.







### All Groupers

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:



### All Reef Lobsters

How many Reef 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:







### Black Sea Urchin

How many Black 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? What was it doing? At what depth did you see it/them? It would be helpful if you note whether the urchins you observed were in separate colonies, and over how large an area each colony was spread (m<sup>2</sup>)?

#### Additional Information:



### Snappers (*Lutjanidae*)

How many Snappers 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 Pressures**

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 Pressures**

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 your 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**

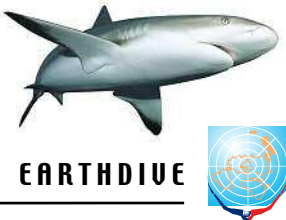
 Did you find any evidence at any time during your holiday/dive trip of the illegal trade of endangered species. (tick box)

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**



**EARTHDIVE**