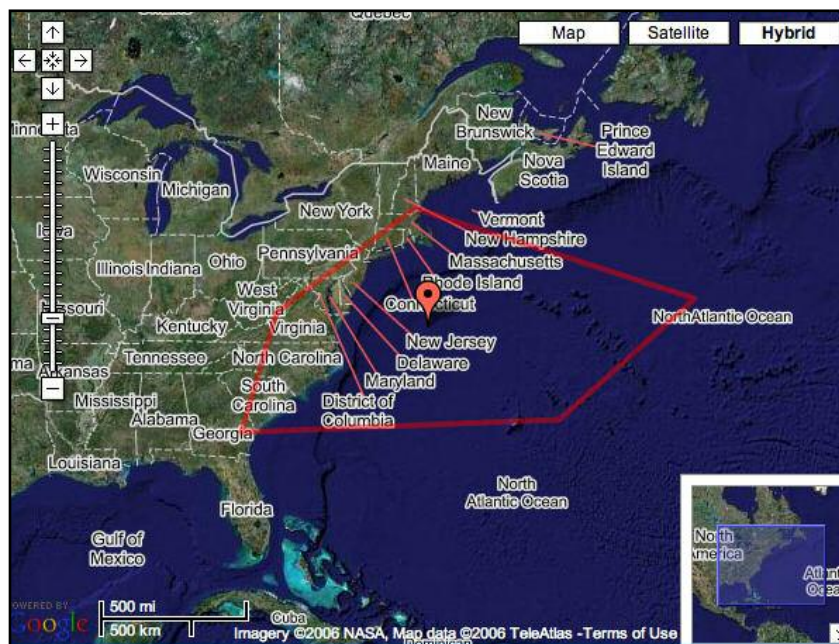


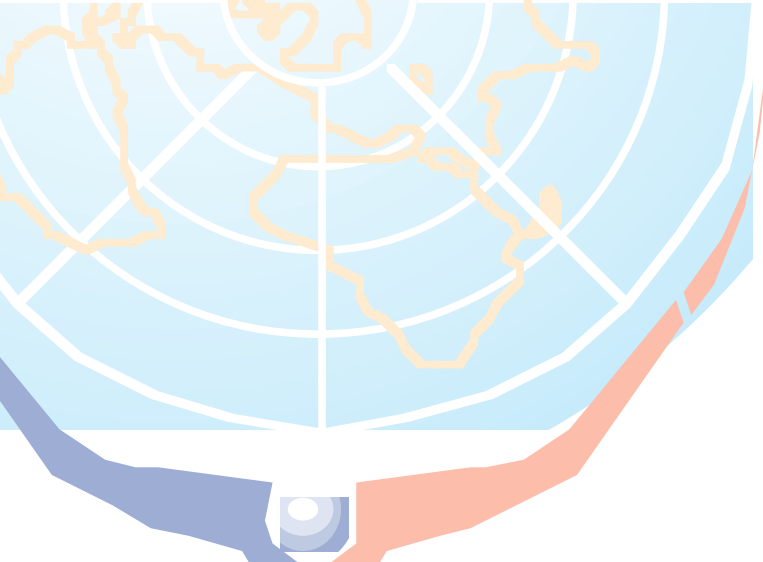


EARTHDIVE

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

PRE-DIVE BRIEFING PACK **Eco-Region 3b** **North America - Atlantic Coast - Temperate**





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1.0 General Information

This booklet is a **pre-dive briefing pack** for the **North America - Atlantic Coast - Temperate** 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 North America - Atlantic Coast - Temperate Eco-region

This eco-region comprises the temperate Atlantic coastal waters of the U.S. states of Connecticut, Delaware, Maryland, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Rhode Island, South Carolina and Virginia.



Temperate Continental Shelves and their seas are generally highly productive regions of great biological significance, hosting resident and migratory fauna during various stages of their life cycle. The relatively shallow waters lead to warmer temperatures and seasonal stratification of the water column based on temperature. Seasonal variation, combined with inflows of freshwater from coastal streams and tidal action, contribute to a variety of habitats and a high degree of biodiversity.

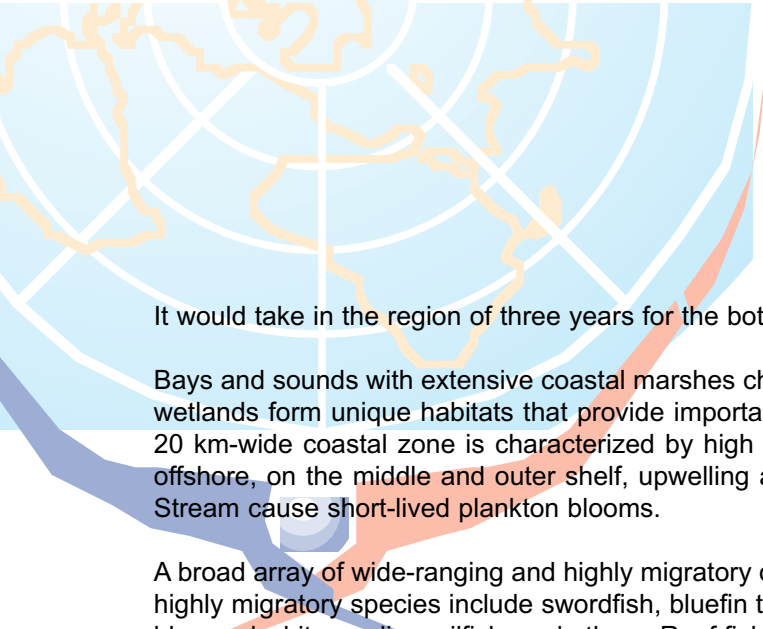
The continental shelf of the eastern United States is no exception this general description. It is a diverse and productive upwelling area, as offshore currents drawing away warm surface water create an upward flow of cold, heavy deep-sea water. The deep-sea water of upwellings is generally rich in nutrients. Upwellings of the sub-tropical and lower-latitude temperate waters of the Southeast shelf ecosystem, however, are not as intense and evident as in the higher latitude regions.

The major currents in the North Atlantic flow in a clockwise direction. This huge area of rotating water is better known as the North Atlantic Gyre (spiral). If you were to drop a bottle in the Gulf Stream off the New Jersey coast, you would probably find it somewhere off the Irish or English coasts in five months or so. It could then find its way down the Atlantic coast of southern Europe, then Africa, then head west just north of the Equator and turn northwest until it washed back up onto the beaches of the eastern United States.



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It would take in the region of three years for the bottle to complete its journey back to New Jersey.

Bays and sounds with extensive coastal marshes characterize the southern portion of this eco-region. These wetlands form unique habitats that provide important links to production of living marine resources. A 10 to 20 km-wide coastal zone is characterized by high levels of plankton production throughout the year, while offshore, on the middle and outer shelf, upwelling along the Gulf Stream front and intrusions from the Gulf Stream cause short-lived plankton blooms.

A broad array of wide-ranging and highly migratory oceanic pelagic fish species is found in the region. These highly migratory species include swordfish, bluefin tuna, yellowfin tuna, bigeye tuna, albacore, skipjack tuna, blue and white marlin, sailfish, and others. Reef fishes include more than 100 species that prefer coral reefs, artificial structures, or other hard-bottom areas, and tilefishes that prefer muddy bottom areas. They range along the coast to a depth of about 200 meters. These compete with other reef fauna, including spiny lobsters, conch, stone crab and corals.

Further north, New Jersey enjoys a somewhat unique position for biodiversity. It sits at the southern limit for species typical of colder, more northerly waters, whilst many species more at home in sub-tropical and tropical waters are swept into the region by the Gulf Stream. This diversity, coupled with the large number of wrecks and artificial reefs, makes diving in this area particularly interesting.

Municipal wastewater treatment plants and pesticides applied to agricultural lands are the major sources of coastal pollution.

3.0 Indicator Species

What to look for and record in the **North America - Atlantic Coast - Temperate** eco-region:

Cods (*Gadidae*)

Low numbers are indicators of overfishing



Sharks

Low numbers are indicators of overfishing



Drums (*Sciaenidae*)

Low numbers are indicators of overfishing



Tuna and Mackerels (*Scombridae*)

Low numbers are indicators of overfishing



Snappers (*Lutjanidae*)

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.

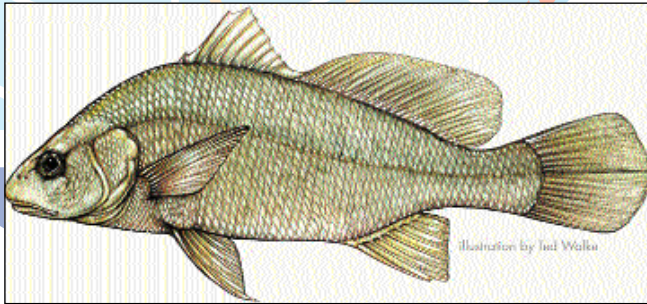
3.1 Cods (*Gadidae*)

The family *Gadidae* of cods and haddocks is found primarily in the circumpolar and temperate seas of the Atlantic, Pacific and Arctic oceans, principally in the northern hemisphere. A commercially important fish, cods are normally found swimming in



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continental shelf. It is omnivorous and feeds at either dawn or dusk.

schools at moderate to deep depths and feed on a variety of invertebrates and other fishes. Some species are noted for their habit of long-distance migration.

One of the most common in the region is the Atlantic cod (*gadus morhua*), to be found in the benthopelagic zone and in brackish waters, at depths of 1 – 600m. This species is widely distributed in a variety of habitats from the shoreline to well down the

Another common member of the family is the haddock (*Melanogrammus aeglefinus*), found at depths of 10-450m over rocks sand or gravel and feeding on small benthic organisms, including molluscs, crustaceans, echinoderms, worms and small fishes.

Most species are demersal, or benthopelagic, that is to say that they are free swimming and will tend to hover over or near the sea floor.

For identification purposes, they have three dorsal (back) fins and two anal fins, with the first dorsal just behind the head. Cods have no spines but do normally have a barbel: slender, whisker-like tactile organs extending from the head.



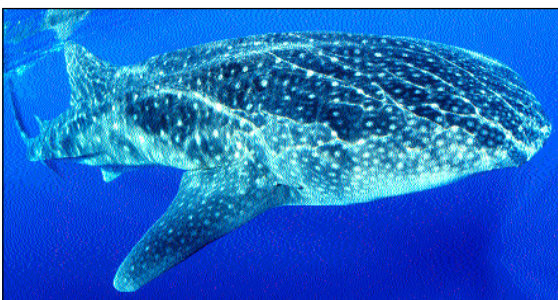
Haddock

Those that you are most likely to see in the region are listed below, with their maximum adult length. Note that intensive fishing practices have rendered two of the species vulnerable as reported on the IUCN Redlist.

●	Atlantic cod	<i>Gadus morhua</i>	100cm (Vulnerable – IUCN)
●	Atlantic tomcod	<i>Microgadus tomcod</i>	38cm
●	Blue whiting	<i>Micromesistius poutassou</i>	50cm
●	Haddock	<i>Melanogrammus aeglefinus</i>	100cm (Vulnerable – IUCN)
●	Polar cod	<i>Boreogadus saida</i>	40cm
●	Pollock	<i>Pollachius virens</i>	130cm

3.2 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.

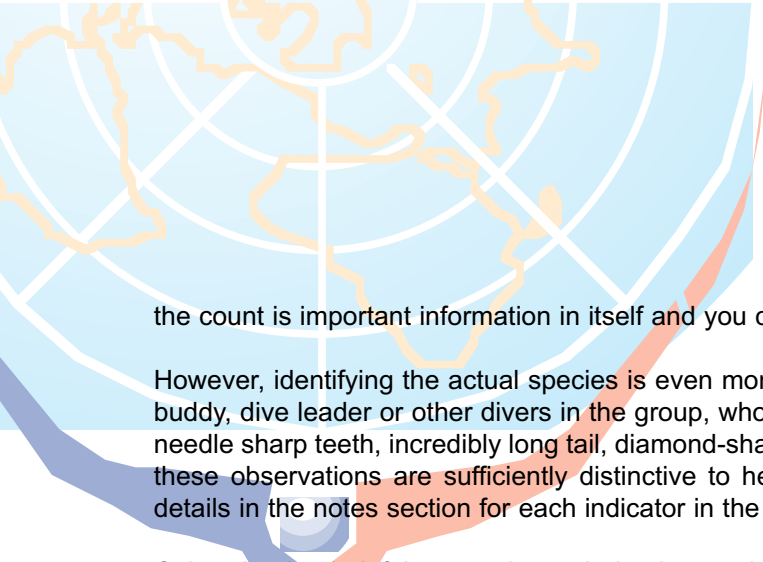


Whale Shark

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**.

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.

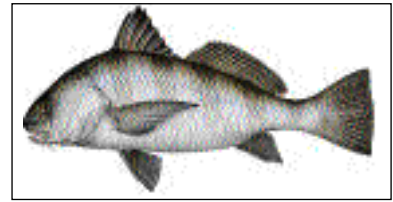
In this way we can tell you which sharks you might encounter in the South America – Atlantic Coast subtropical eco-region and some of these are listed below, but given the enormous diversity of species within the region, this list is not all-inclusive:

- | | |
|--|-----------------------------------|
| ● Atlantic Sharpnose Shark | <i>Rhizoprionodon terraenovae</i> |
| ● Basking Shark | <i>Cetorhinus maximus</i> |
| ● Bigeye Thresher Shark | <i>Alopias superciliosus</i> |
| ● Blacktip Shark | <i>Carcharhinus limbatus</i> |
| ● Blacknose Shark | <i>Carcharhinus acronotus</i> |
| ● Blue Shark | <i>Prionace glauca</i> |
| ● Bluntnose Sixgill Shark | <i>Hexanchus griseus</i> |
| ● Bull Shark | <i>Carcharhinus leucas</i> |
| ● Dusky Shark | <i>Carcharhinus obscurus</i> |
| ● Finetooth Shark | <i>Carcharhinus isodon</i> |
| ● Galapagos Shark | <i>Carcharhinus galapagensis</i> |
| ● Great White Shark (Vulnerable - IUCN) | <i>Carcharodon carcharias</i> |
| ● Lemon Shark | <i>Negaprion brevirostris</i> |
| ● Night Shark | <i>Carcharhinus signatus</i> |
| ● Nurse Shark | <i>Ginglymostoma cirratum</i> |
| ● Oceanic Whitetip Shark | <i>Carcharhinus longimanus</i> |
| ● Porbeagle Shark | <i>Lamna nasus</i> |
| ● Sandbar Shark | <i>Carcharhinus plumbeus</i> |
| ● Sand Tiger Shark (Vulnerable - IUCN) | <i>Carcharias taurus</i> |
| ● Scalloped Hammerhead Shark | <i>Sphyrna lewini</i> |
| ● Shortfin Mako Shark | <i>Isurus oxyrinchus</i> |
| ● Silky Shark | <i>Carcharhinus falciformis</i> |
| ● Smalltooth Sawfish (Endangered - IUCN) | <i>Pristis pectinata</i> |
| ● Smooth Hammerhead Shark | <i>Sphyrna zygaena</i> |
| ● Spinner Shark | <i>Carcharhinus brevipinna</i> |
| ● Thintail Thresher Shark | <i>Alopias vulpinus</i> |
| ● Whale Shark (Vulnerable - IUCN) | <i>Rhincodon typus</i> |



3.3 Drums (*Sciaenidae*)

The *sciaenids* are a large family of primarily bottom associated, carnivorous fishes distributed throughout the Atlantic, Indian and Pacific oceans, in tropical and temperate inshore waters. The majority occur on open sand and mud bottoms and some are found only in brackish waters. The exact number of species is uncertain, but there are probably about 270.



Black Drum

Drums are also commonly called croakers, and for good reason. They have modified muscular swim bladders that they use to produce a drumming or croaking sound when they are excited. Drums are luminescent and appear pink when first removed from the water. A drum's tail is slightly pointed, and it has faint stripes across its back and small chin barbels.

Drums or croakers are distributed mostly in temperate and tropical waters. They are bottom dwelling carnivores, feeding on benthic invertebrates and small fishes

The largest drum in the region is the Black Drum (*Pogonias cromis*). The scientific name is derived from the Greek and approximates to bearded grunter. This species has conspicuous chin barbels and utters the customary loud grunting sound when excited. Adults have dusky to black fins and are silver with a brassy lustre. Young drum possess 4 to 6 black vertical bars, and may be misidentified as juveniles of closely related species.

The preferred habitat is coastal waters including bays, sounds, and inlets where salinities range from near fresh to sea strength. They are commonly found near bridges, piers and other manmade structures.

Black drum feed on the bottom, aided in their search for food by the chin barbels that serve as feelers. Food items include clams, mussels, oysters, crabs, worms, and some fishes. Strong throat teeth (pharyngeals), are capable of crushing shells of clams, oysters, and crabs to make them easier to digest.

The species that you are most likely to see in the waters of this eco-region are listed below, with the maximum adult length:

● Atlantic Croaker	<i>Micropogonias undulatus</i>	50 cm
● Banded Drum	<i>Larimus fasciatus</i>	25 cm
● Black Drum	<i>Pogonias cromis</i>	170 cm
● Cubbyu	<i>Equetus umbrosus</i>	25 cm
● High-hat	<i>Equetus acuminatus</i>	23 cm
● Jack-knifefish	<i>Equetus lanceolatus</i>	25 cm
● Northern Kingcroaker	<i>Menticirrhus saxatilis</i>	36 cm
● Red Drum	<i>Sciaenops ocellatus</i>	155 cm
● Silver Croaker	<i>Bairdiella chrysoura</i>	30 cm
● Southern Kingcroaker	<i>Menticirrhus americanus</i>	50 cm
● Spot Croaker	<i>Leiostomus xanthurus</i>	38 cm

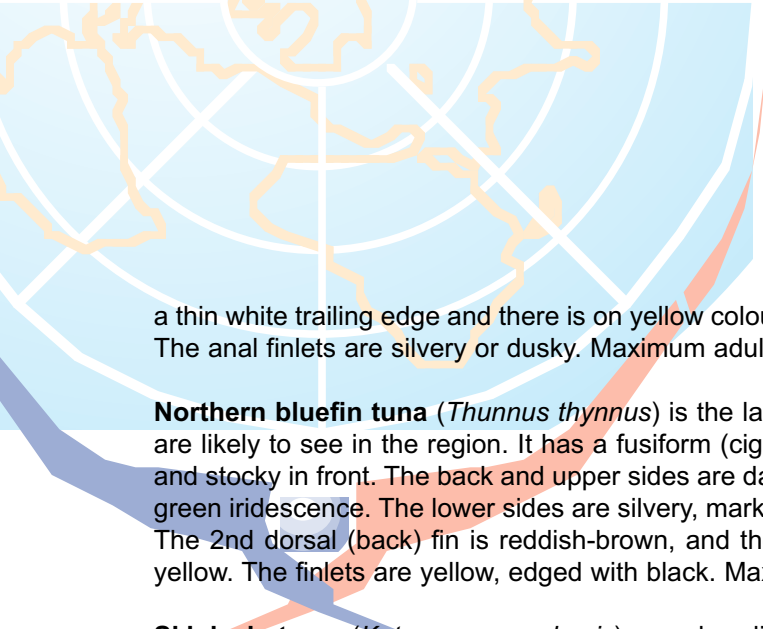
3.4 Tuna and Mackerels (*Scombridae*)

The *Scombridae* family of tuna and mackerel are fast-swimming, wide-ranging pelagic fishes. They have a number of special adaptations for this lifestyle, including a streamlined body form and recessible dorsal and anal fins. Some species are partly endothermic, maintaining a higher body temperature in the swimming muscles. Scombrids often swim in schools and prey on other fishes. Many species are very important as sport fishes and in commercial harvest.



Albacore (*Thunnus alalunga*) can be distinguished from other tunas by a long pectoral (breast) fin that may reach to a point beyond the anal fin. Albacore are devoid of any stripes or spots on lower flanks and belly. The tail fin has





a thin white trailing edge and there is on yellow colouring on the main fins, but the dorsal finlets are yellowish. The anal finlets are silvery or dusky. Maximum adult length is 140cm.

Northern bluefin tuna (*Thunnus thynnus*) is the largest member of the family that you are likely to see in the region. It has a fusiform (cigar shaped) body, compressed and stocky in front. The back and upper sides are dark blue to black with a gray or green iridescence. The lower sides are silvery, marked with grey spots and bands. The 2nd dorsal (back) fin is reddish-brown, and the anal fin is dusky with some yellow. The finlets are yellow, edged with black. Maximum adult length is 450cm.



Skipjack tuna (*Katsuwonus pelamis*) can be distinguished from other tunas by the presence of stripes on the belly. There are normally between 4 and 6 prominent, longitudinal stripes from lower belly and sides toward the tail. The top of the fish a dark purplish-blue and the lower flanks and belly are silvery. Maximum adult length is 105cm.



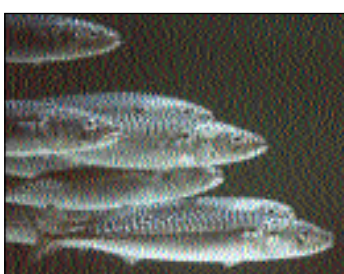
Bigeye tuna (*Thunnus obesus*). A stocky body and large eyes are characteristic of this species. The pectoral fin reaches 2nd dorsal fin. The first dorsal fin is deep yellow with the second dorsal and the anal fins being brownish or yellowish with narrow black edges. Finlets are yellow with dark edges. A lateral iridescent blue band runs along the sides. Maximum adult length is 105cm.



The Atlantic bonito tuna (*Sarda sarda*) can be distinguished from other tunas by the presence of seven or more (often 9-12) oblique dark stripes on the dorsal side of the fish. The back of the fish is steel blue or blue-green and the flanks and belly are silvery to whitish. The body is entirely covered with scales, which are very small except in the pectoral region. Bonito have large conical teeth on both the upper and lower jaw. Maximum adult length is 105cm.



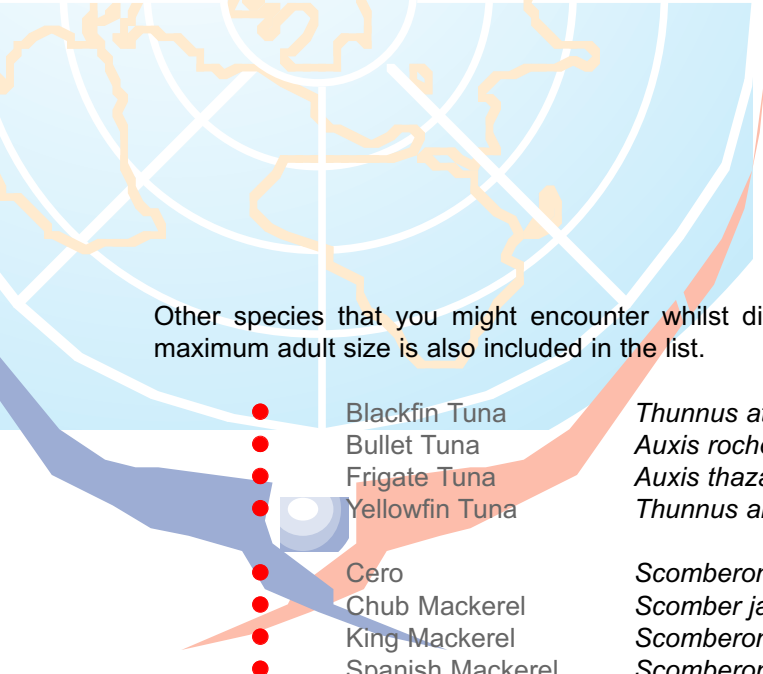
The little tunny (*Euthynnus alletteratus*) is found worldwide in tropical to temperate waters, between 56°N-30°S. In the western Atlantic Ocean, it ranges from Massachusetts (US), south to Brazil, including the Gulf of Mexico, Caribbean Sea and Bermuda. It is the most common member of the Scombridae family in the western north Atlantic. It is distinguished by a scattering of dark spots, usually resembling fingerprints between the pectoral and ventral fins. This species also has wavy markings found on the back above the lateral line, located within a well-marked border that never extends further forward than the middle of the first dorsal fin. The teeth are small and conical. Maximum adult length is 120cm.



The Atlantic mackerel (*Scomber scombrus*) is probably the most recognised of the numerous species of mackerel. This beautiful fish has a bright green body with many dark stripes that run in an irregular pattern. A type of luminous effect is found on the sides and under parts of this fish that give it a reddish reflection. Atlantic mackerel feed mostly on sardines, young herring, anchovies and small crustaceans. Mackerel travel in large schools on both sides of the Atlantic Ocean. In the Northwest Atlantic, they range from northern Carolina to southern Labrador. In the eastern Atlantic, they are found off Iceland and northern Norway. Noted as a delicious food fish, Europeans harvest them by freezer trawlers, whilst the purse seine is the harvest method of choice for North American fishermen (a purse seine is a large vertical, weighted net designed to be set by two boats around a school of fish and then pulled closed at the bottom by means of a line).

One of the more amazing characteristics of the mackerel is their ability to speedily dive when threatened by a predator. The lack of a swim bladder makes it possible for them to move into deep waters almost as quickly as the predator appears. Predators include dolphins, tuna and sharks. Maximum adult length is 60cm.



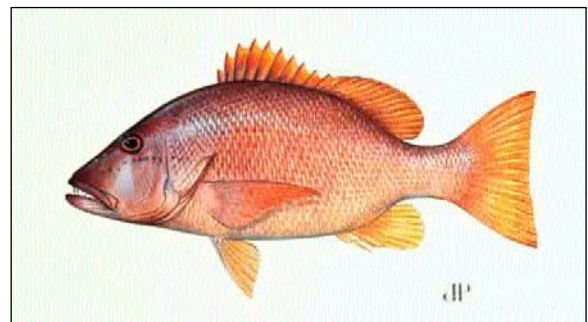


Other species that you might encounter whilst diving in the region are shown below. The approximate maximum adult size is also included in the list.

●	Blackfin Tuna	<i>Thunnus atlanticus</i>	105 cm
●	Bullet Tuna	<i>Auxis rochei rochei</i>	50 cm
●	Frigate Tuna	<i>Auxis thazard thazard</i>	65 cm
●	Yellowfin Tuna	<i>Thunnus albacores</i>	230 cm
●	Cero	<i>Scomberomorus regalis</i>	180 cm
●	Chub Mackerel	<i>Scomber japonicus</i>	64 cm
●	King Mackerel	<i>Scomberomorus cavalla</i>	180 cm
●	Spanish Mackerel	<i>Scomberomorus maculatus</i>	90 cm

3.5 Snappers (*Lutjanidae*)

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.



The dog snapper (*Lutjanus jocu*)

There are over one hundred individual species globally, but within the North America - Atlantic Coast - temperate 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.

The dog snapper (*Lutjanus jocu*) is the largest member of the family that you are likely to see in the region, and it can be found as far north as Massachusetts. With a maximum length of 128 cm and weighing around 25 kg, it will commonly be found around rocky or coral reefs. The back and upper sides are olive brown with a bronze tinge, sometimes with narrow pale bars. The lower sides and belly are lightish-red with a copper tinge. Its diet consists mainly of other smaller fishes and bottom dwelling invertebrates such as shrimps, crabs, gastropods and cephalopods.

Other species that you might encounter whilst diving in the region are shown below. The approximate maximum adult size is also included in the list, as is the most northerly state where you would expect to see a particular species – but be prepared to be surprised!

●	Blackfin Snapper	<i>Lutjanus buccanella</i>	75cm	NC
●	Grey Snapper	<i>Lutjanus griseus</i>	89cm	MA
●	Lane Snapper	<i>Lutjanus synagris</i>	60cm	NC
●	Mahogany Snapper	<i>Lutjanus mahogoni</i>	48cm	NC
●	Mutton Snapper	<i>Lutjanus analis</i>	94cm	MA
●	Northern Red Snapper	<i>Lutjanus campechanus</i>	100cm	MA
●	Queen Snapper	<i>Etelis oculatus</i>	100cm	NC
●	Schoolmaster Snapper	<i>Lutjanus apodus</i>	65cm	MA
●	Silk Snapper	<i>Lutjanus vivanus</i>	83cm	NC
●	Vermillion Snapper	<i>Rhomboplites aurorubens</i>	60cm	NC
●	Wenchman	<i>Pristipomoides aquilonaris</i>	56cm	NC
●	Yellowtail Snapper	<i>Ocyurus chrysurus</i>	85cm	MA





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 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 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.

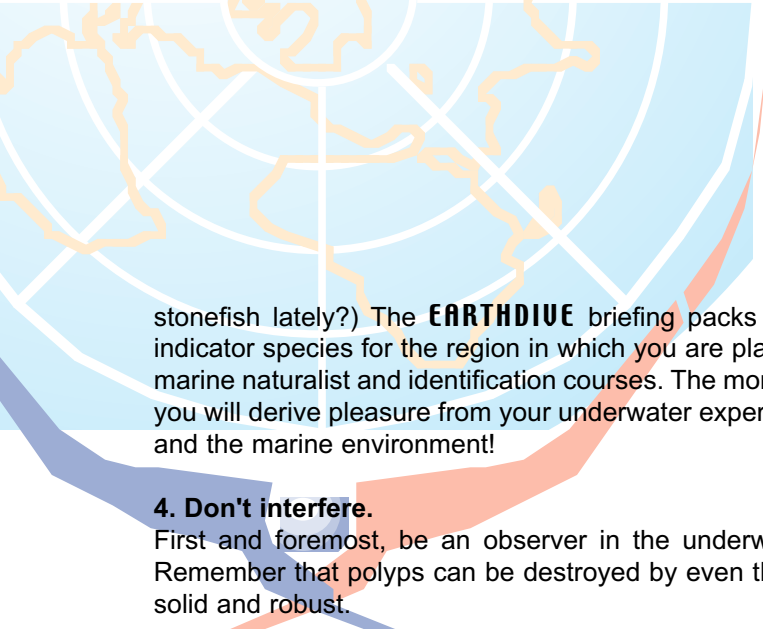
3. Understand and respect marine flora and fauna.

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



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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:

- 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.

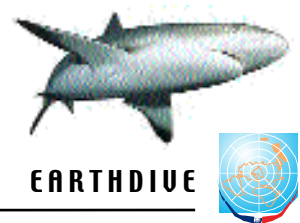
Don't be tempted to collect shells, corals or other mementos of your dive. If you want a souvenir, take a photograph!

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.





Cods (*Gadidae*)

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

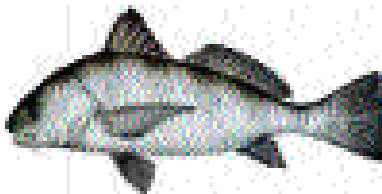
0 1 - 5 6 - 20 20 - 50 51 - 250 >250

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:



Drums (*Sciaenidae*)

How many Drums 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:





Tuna and Mackerels (*Scombridae*)

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

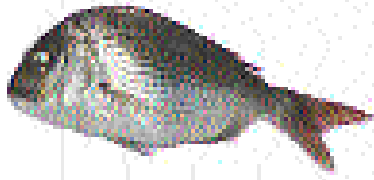
0 1 - 5 6 - 20 20 - 50 51 - 250 >250

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:



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)

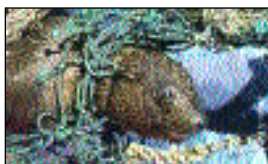


Subsurface Pressures

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 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)

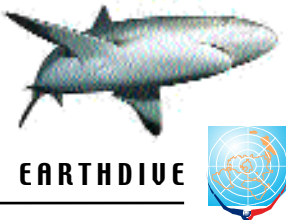
Yes No Dont Know

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.



© Elizabeth Fleming
Turtle shell ornaments on display

TRAFFIC



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