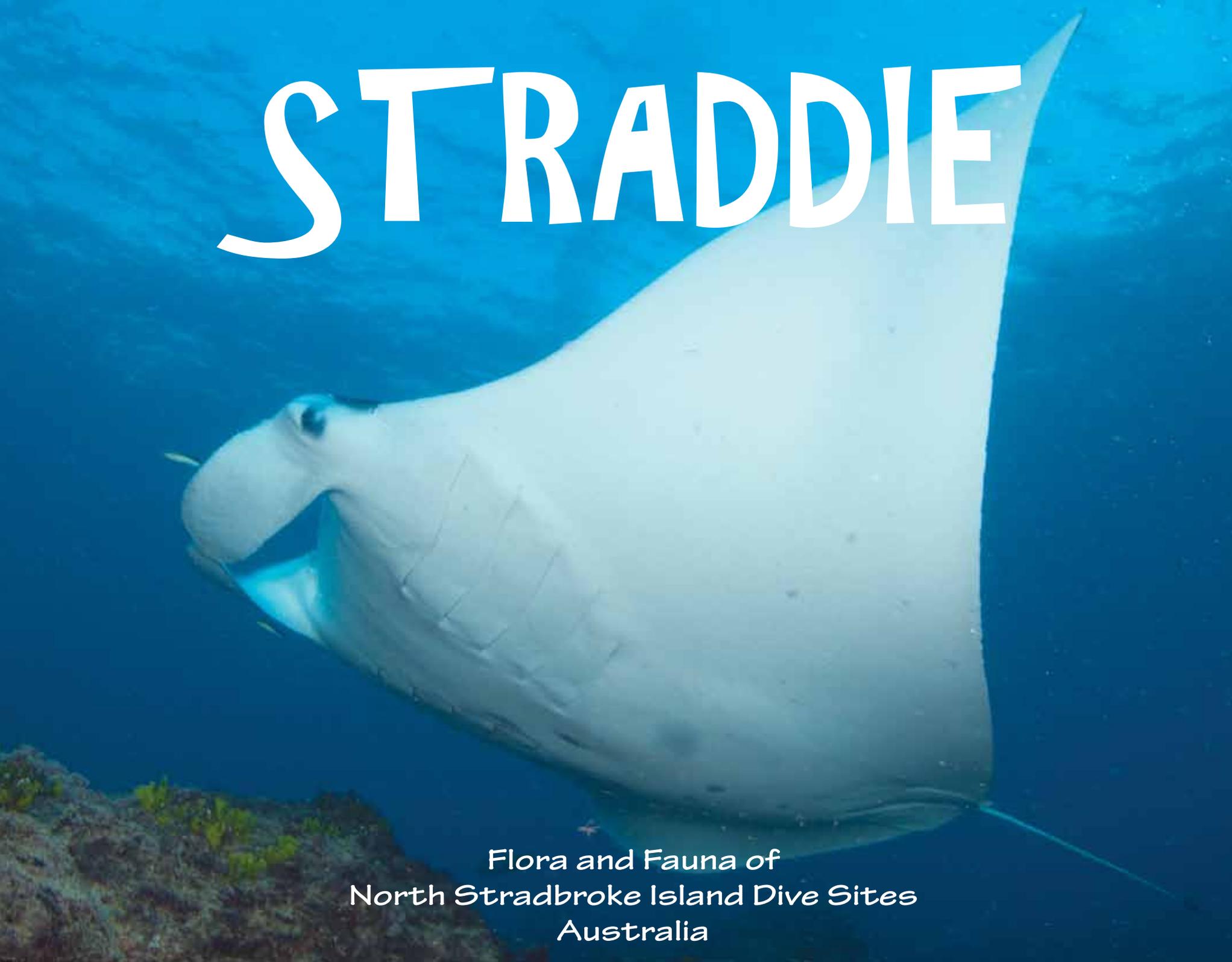


# STRADDIE

A large white stingray is swimming in clear blue water. The stingray is the central focus, with its head on the left and its tail on the right. The word "STRADDIE" is written in large, white, bold, sans-serif capital letters across the top of the image, partially overlapping the stingray's head and the water. The background is a deep blue, and there is a rocky reef structure visible in the bottom left corner.

Flora and Fauna of  
North Stradbroke Island Dive Sites  
Australia





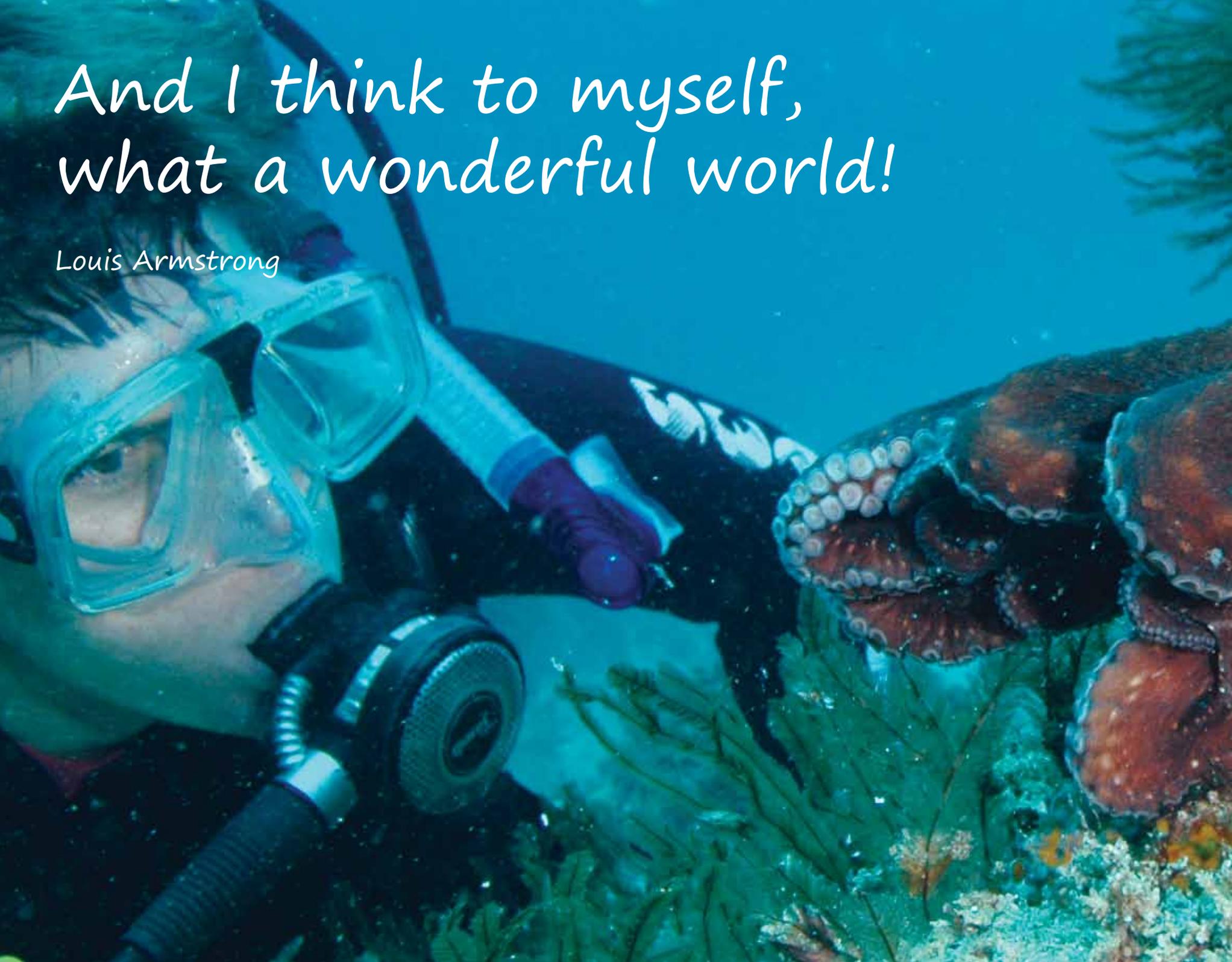
# STRADDIE



Flora and Fauna of  
North Stradbroke Island Dive Sites  
Australia

*And I think to myself,  
what a wonderful world!*

*Louis Armstrong*







# ForeWord

*North Stradbroke Island, known by Traditional Owners the Quandamooka People as Minjerribah, is internationally renowned for its spectacular scenery.*

*From stunning white sand beaches and Pandanus-studded rocky headlands, to clear lakes and wildflower-filled bushland, the island has wonderfully diverse landscapes. Straddie is a place that once it is in your system, it is easy to love and impossible to forget.*

*Most people can picture the crystal blue waters surrounding Straddie, but as this book highlights, that is only the beginning of the story. Sink further beneath the waves and you will find a hidden world, with some of Australia's most prestigious dive sites.*

*From Manta Ray Bommie – rated one of Australia's top 10 dive sites – to Shag Rock, the diversity of underwater ecosystems echoes that found on land. This includes Flat Rock's Shark Gutters, an important home to the endangered grey nurse shark population.*

*Redland City Council is honoured to have partnered with The University of Queensland Underwater Club (UniDive), Sibelco Australia, Transit Systems, Manta Lodge and Scuba Centre and Point Lookout SCUBA on the Point Lookout Ecological Assessment (PLEA) of dive sites.*

*This important project saw more than 50 UniDive volunteers conduct marine surveys on dive sites around Point Lookout.*

*The resulting not-for-profit book not only gives a fascinating glimpse of the beauty of this underwater world, but also shines the spotlight on how crucial it is to preserve these ecological wonders.*

*I would like to thank all volunteer divers and contributors to this book. The material you have gathered during your time in the waters off Straddie has resulted in a publication that is a mix of valuable practical information and simply beautiful photographs.*

*I have no doubt readers will agree that protecting and caring for North Stradbroke Island and its surrounding seas should remain a priority for locals and visitors alike.*



*Karen Williams  
Mayor of Redland City*



# PreFace

*Clear blue sky, 10 knots south-easterly, 35 degrees celsius: A rusty, orange Toyota troopy with ten divers in the back is towing a rubber duckie, while finding its way through the soft sand to a beach launching spot. It is the 25 January 1998. The driver asked with a distinct Aussie accent: “what ya wanna see, nudibranchs, octopus or manta rays?” Laughingly, I answered: “all of course”, and thought, another dive operator promising too much. Two hours later, after my first dive at Manta Ray Bommie, Point Lookout, I thought, mind blowing, unreal it cannot be true. Having done my share of dives in the world since 1981, I was introduced to what is still, an underrated world class dive site full of megafauna: manta, eagle, and bull rays, leopard and wobbiegong sharks, Spanish dancers, and courting octopus.*

*After hundreds of dives at Point Lookout, in which I have relaxed, guided friends and family, trained divers, photographed, monitored and mapped; I have done it all, at a place I love, ‘Straddie’.*

*‘Straddie’ is a pictorial description of some of the mind-blowing observations that divers experience while exploring the diverse flora and fauna at the Point Lookout dive sites. This book aims to show the community the beauty, abundance and variety of marine life on Straddie’s reefs. It provides support for conservation and management initiatives, and helps educate the reader about Straddie’s underwater paradise. It was an honour to create this book with Lock, Diana and all other volunteers. With this book we like to show our respect to, and thank the Traditional Owners.*

*Contributing photos are from the observant and creative eyes of: Douglas, David, Dunia, Olivier, Alex, Jen, Dee, Djoy, Lock, Justin, Ruth, Michele and myself. Maps provided the basis of exploration and were created for the rocky reefs by cartographers: Mike, Lock, Trevor, Lee, and Douglas. The pictures were brought together by the brilliant writing and editing of: Lock, Jen, Diana, Ruth, Karen and Eva. Diana made the book a pleasure to dive into, by combining photos, maps and text capturing the beauty of these dive sites, by using her graphic design skills. All are volunteers in the Point Lookout Ecological Assessment (PLEA) community funded project, which was conducted by UniDive (The University of Queensland Underwater Club) in 2014. UniDivers, their families and their friends spent hours of learning, videoing, photographing, survey diving, analysing and writing as part of the PLEA project and made it a huge success. The volunteers would like to thank Ken Holzheimer (the driver, with the still distinct Aussie accent) for bringing us back safely to shore.*



*We would like to thank the many people and organisations that made the PLEA project a success. PLEA was made possible with the financial and in-kind support of the Redland City Council Community Program, Sibelco Australia, Point Lookout Scuba, Transit Systems, and the School of Geography, Environmental Management and Planning at The University of Queensland. We would also like to thank Reef Check Australia, CoralWatch, Grey Nurse Shark Watch, Manta Lodge and Scuba Centre, Moreton Bay Research Station, Centre of Marine Science at The University of Queensland and the Quandamooka people.*

*Dr Chris Roelfsema (PLEA Project Organiser)*

*“People protect what they love” Jacques Yves Cousteau*

# CONTENTS



## FLORA AND FAUNA

The majority of this book is on the magnificent underwater world and the wonderful life in Straddie's waters. There's a plethora of photos of algae, coral, invertebrates, sponges, sea stars, rays and sharks.

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## Dive Sites

The Point Lookout dive sites offer world class diving. In this section are descriptions and maps for SCUBA divers wanting to explore.

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## Caring For Our Reefs

It's important to remember the Divers' Code of Conduct and how to reduce the impacts on our fragile reef ecosystems. Options are provided on how to get involved in caring for our reefs.

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## PLEA

The story of how the volunteers conducted the Point Lookout Ecological Assessment to monitor the health of the rocky reefs of North Stradbroke Island.

page 92-96

# ISLAND OF DELIGHT North Stradbroke Island



Minjerribah, the sand island home to the Quandamooka people, was named Stradbroke Island in 1827 by Captain Henry John Rous. It was named in honour of his father, the Earl of Stradbroke. The new name was short lived, and in 1896 a storm split the island in two: creating North Stradbroke Island and a much smaller, South Stradbroke Island.

North Stradbroke Island is the second largest sand island in the world, and an island with a rich variety of flora and fauna. Although only a small resident population, thousands of local, national and international tourists visit the island. There are three main townships, Dunwich, Amity Point and Point Lookout, which support those exploring the variety of beaches, myriad of lakes and wetlands, or the underwater world.

Of the three townships, Point Lookout sits on a rhyolite rock formation on the northeast corner and overlooks the



vessels rounding the point into Moreton Bay. The popular tourist town swells on weekends and school holidays with explorers eager to experience the delights the island and the surrounding water has to offer.

Amity Point and Dunwich, two villages on the western side of the island, provide a safe anchorage for fishing vessels and recreational sailors when the seas of Moreton Bay become too rough. Dunwich, the unofficial capital of the island has a small school, medical centre and The University of Queensland research station.

Quandamooka is the Aboriginal name for Moreton Bay and the people encompass the Dandrubin-Gorenpul, Ngugi and Noonucal clans. Collectively they refer to themselves as the people of Quandamooka. For them, Blue Lake and Brown Lake, two of the over 100 lakes found on the island, have significant cultural heritage.

Whilst this book is about the flora and fauna of the dive sites found off Point Lookout, the island is also rich with diversity. Besides the many lakes there are also springs, wetlands, swamps and dry sclerophyll forests that provide a home for rare animals and plants.





# FLORA and Fauna



## Rocky ReefS Point Lookout



North Stradbroke Island is situated in the subtropical waters of the Pacific Ocean, thirty-five kilometres west of the continental shelf. Off the northern tip of the island, situated on the cusp of the Coral Sea and the entrance into Moreton Bay, are the rocky reefs of Point Lookout.

The dive sites are characterised by exposed rocks, often home to migrating birds. They are surrounded by variable currents that support the distribution and abundance of flora and fauna. Tidal waters move in and out of Moreton Bay and along the island's shore. The longshore East Australian current forces warmer water down from the Coral Sea. Colder waters from the south are pushed up by the predominant south-easterly wind. These currents, and the variable water temperature (between 18 and 26 degrees celsius), contribute in their different ways to create a favourable diving environment.

The rocky reefs are overgrown with an assortment of plants, sponges and corals. A thin layer (1 cm) of plants, known



as turf algae covers most of the substrate. In the crevices, the pinkish tinge of crustose coralline algae provides some colour. These crevices provide a cosy environment for the larvae of corals and other reef organisms to settle and grow. Several species of larger plants (1 cm plus) known as green, brown and red macro algae live here and can be an indicator of disturbances such as pollution. Although not as varied as their counterparts in the Great Barrier Reef (GBR), the rocky reefs around Straddie are diverse and provide shelter, food and three-dimensional structure to a plethora of marine creatures.

The geological formations of the rocky reefs create habitats that attract marine megafauna. The crevices, deep gullies, swim throughs and caverns provide perfect hiding holes for turtles, rays, and cod. The gutters and sharp drop offs to deeper water ensure that smaller fish are more accessible to larger pelagics and sharks. These rocky reefs provide an ecosystem that supports the smallest to the largest, and the simplest to the most complex of marine creatures.





Red Algae - *Laurencia*

Algae are **AQUATIC PLANTS** that contribute to reef growth, and provide food and habitat for many marine animals. Green algae such as turtle weed grows on the rocks and the bright green tufts are often home to small crabs.



Turtle Weed - *Chlorodesmis major*



Green algae - *Halimeda discoidea*  
Turf algae (< 1 cm) covering the rock



*Halimeda* is a reef building algae due to the calcium carbonate in its leaves, which remains after the plant has died. The calcium carbonate in the tissue makes it inedible to most herbivores.

Algae live everywhere on the reef, but if the balance of the ecosystem is upset, the macro algae can take over. The small pencil-like shavings of *Lobophora* cover a large percentage of the rocky reefs. Iodine weed is named because of its reddish colour. When touched it excretes a fine red film that remains on the skin like iodine.

*Halophila ovalis*, as opposed to algae, is a flowering plant similar to its land-based grass counterparts. This plant is an important food source for dugongs, so it is also known as dugong grass. Seagrass grows in sandy areas throughout Moreton Bay.



Brown Macro Algae - *Lobophora variegata*



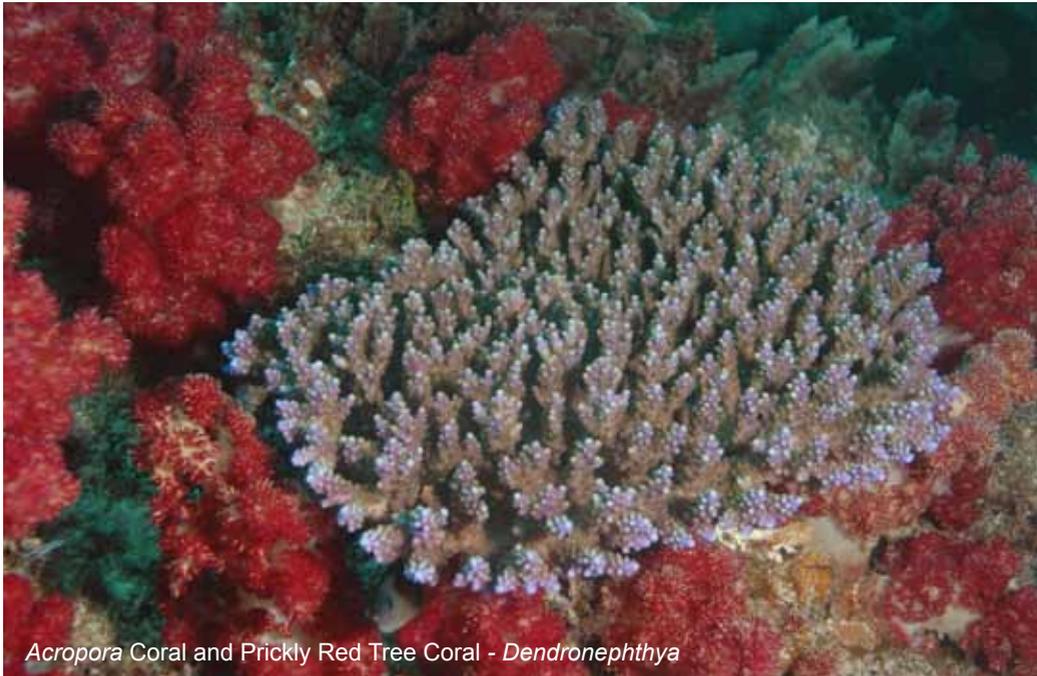
Iodine Weed - *Asparagopsis taxiformis*



Seagrass - *Halophila ovalis*



*Turbinaria mesenterina*



*Acropora Coral and Prickly Red Tree Coral - Dendronephthya*

**CORALS** are marine invertebrates and live in colonies of identical individual polyps. Some polyps are almost invisible to the naked eye, but the larger corals can resemble gardens of tiny flowers when they extend their tentacles to actively feed at night. Corals can either have a hard or soft skeleton. Despite some appearing robust and solid, they are all extremely delicate. The polyps are connected by a fine layer of tissue that covers the skeleton. This tissue is easily damaged when touched and the coral can get infected, killing the entire colony.

Hard (or stony corals) come in all shapes and forms, from delicate cup-like shapes to massive boulders.



*Faviidae*



Individual polyps of branching coral - *Acropora*

Corals can fight deadly battles to protect their space. They extend their tentacles to attack with harpoon-like structures filled with venom called nematocysts. Other corals such as branching corals use different tactics; they try to outgrow their neighbours to block light and other sources of energy.



Corals fighting for space - *Faviidae* sp.



Brain Coral - *Goniastrea australensis* and Branching Acropora Coral - *Acropora spp.*

**BRAIN CORALS**, named for their resemblance to a human brain, are hard massive corals recognised by the labyrinth of gullies crossing their skeleton. In these corals it is very difficult to see where one individual polyp ends and the next begins.

Branching coral (e.g. *Acropora*) can re-grow faster than these sturdy massive or encrusting hard corals, but are more subject to human or natural impacts.

Corals live in a symbiotic relationship with a microscopic algae called zooxanthellae. This algae provides the coral with nutrients and receives in return, a safe home.





Brain Coral - *Goniastrea australensis*



Prickly Red Tree Coral - *Dendronephthya*

Colourful **SOFT CORALS** resemble small trees or plants and are often mistaken for algae or sponges. Soft corals hold large amounts of water in their tissue and instead of a robust skeleton, they have small spicules embedded in their tissue. This keeps them straight, allowing the tentacles to catch plankton out of the water column. Fan, or whip-like corals, and the ornate soft corals, are often found in areas with lots of water movement.



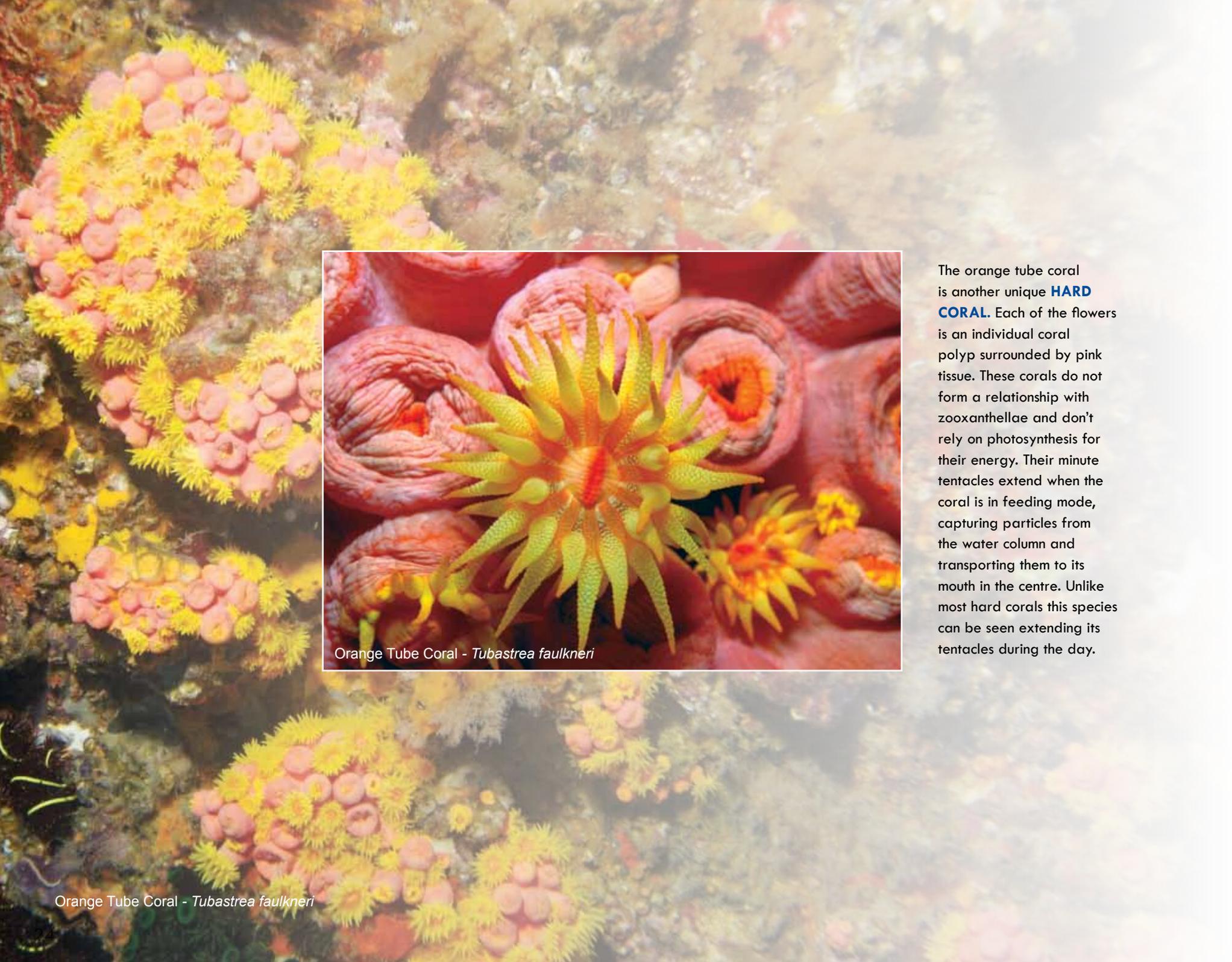
Leathery Soft Coral - *Sarcophyton*



Whip Coral - *Junceella*



Red Sea Fan - *Melithaea*



Orange Tube Coral - *Tubastrea faulkneri*

The orange tube coral is another unique **HARD CORAL**. Each of the flowers is an individual coral polyp surrounded by pink tissue. These corals do not form a relationship with zooxanthellae and don't rely on photosynthesis for their energy. Their minute tentacles extend when the coral is in feeding mode, capturing particles from the water column and transporting them to its mouth in the centre. Unlike most hard corals this species can be seen extending its tentacles during the day.

Orange Tube Coral - *Tubastrea faulkneri*

Jellyfish or 'Jellies' as they are colloquially known, are not true fish, but are grouped in the same phylum as corals (cnidarians). A coral polyp is essentially an inverted jellyfish residing inside a limestone cup.

**JELLIES** are important to the reefs because their tentacles provide shelter to juvenile fish and they are a food source for turtles.



Giant Crinkled Jellyfish - *Versuriga anadyomene*



Christmas Tree Worm - *Spirobranchus corniculatus* complex

Invertebrates such as the **FEATHER STAR**, position themselves on rocks in currents. They extend their arms to capture food while their legs help to grip the rock.



Coral with Featherstar - *Himerometra robustipinna* and Banded Coralshrimp- *Stenopus hispidus*



Robust Featherstar (close-up)- *Himerometra robustipinna*



Eastern Slate-pencil Urchin - *Phyllacanthus parvispinus*

**URCHINS** play an important role by grazing turf algae off the rocks, creating more space for corals to grow. The collector urchin is difficult to recognise as it roams the reef covering itself with shells, bits of broken coral, fish hooks or any loose material. The fire urchin is bold red in colour, but named for the burning pain it causes when touched.



Fire Urchin - *Asthenosoma periculosum*



Burrowing Sea Urchin - *Echinostrephus aciculatus*



Needle-spined Sea Urchin - *Diadema savignyi*



Rock-boring Sea Urchin - *Echinometra mathaei*



Collector Urchin - *Pseudoboletia maculata*



Cushion Star - *Culcita novaeguineae*



Vermillion Sea Star - *Pentagonaster dubeni*



Blue Sea Star - *Linckia laevigata*

**SEA STARS** dot the reefs in all shapes and colours. They graze the substrate and move using minute suction pads. If they lose a limb it will simply grow back.



Black Sea Cucumber (20 cm) - *Holothuria atra*

Sea cucumbers have leathery skin with an elongated body. Gathered in many parts of the world for human consumption, the **SEA CUCUMBER** provides an important service in the marine system by recycling nutrients.



Anemone

A plethora of **ANEMONES** live on the rocks. They feed by extending their tentacles, paralyzing small fish and pulling them into their central mouth. Like corals, they have a symbiotic relationship with zooxanthellae.



Pastel Sheet Ascidian - *Symplegma brakenhielmi*



Orange-spouted Sea Squirt - *Cnemidocarpa stolonifera*



Anemone



Spanish Dancer - *Hexabranchnus sanguineus*



Spanish Dancer - *Hexabranchnus sanguineus*

A nudibranch is a small soft-bodied mollusc found on the rocks, among vegetation, or on soft corals. They occur in a rainbow of colours and differing shapes. Their colours are warning signs, telling predators that they are poisonous. One of the larger nudibranchs, which grows to 20 cm is the Spanish dancer, named because its form, colour and movement resembles that of a flamenco dancer's dress.

**FLAT WORMS** can be as colourful and similar in size to the **NUDIBRANCH**, however they don't have external gills (branchias) like nudibranchs. They are closely related to tapeworms and other parasites.



Siboga Aeolid - *Trinchesia sibogae*



Reticulated Chromodoris - *Chromodoris reticulata*



Black-edged Nudibranch - *Glossodoris atromarginata*



Elisabeth's Nudibranch - *Chromodoris elisabethina*



Flat Worm - *Thysanozoon*



Splendid Nudibranch - *Chromodoris splendida*



Varicose Phyllidid - *Phyllidia varicosa*



Nudibranch egg mass



Mourning Cuttlefish - *Sepia plangon*



Day Octopus - *Octopus cyanea*



Day Octopus - *Octopus cyanea*



Cuttlefish, squid and octopus are **CEPHALOPODS**. They are masters of camouflage, able to change the colour and texture of their skin to match their surroundings to escape from predators. They have very complex mating behaviour, mostly involving visual cues. Among their arms, the males have one specially modified to mate with their partner.

Squids and octopuses are capable of navigating complicated mazes in search of food. Their eyes have developed to see colours and patterns almost as well as the human eye. Cephalopod nervous systems are one of the most studied in the animal kingdom.

Cowries have been used by many cultures, as 'shell money'. The beautiful colour patterns, the smoothness, and the symmetry of these shells has universal appeal. Unlike the mobile cowrie the giant clam (up to 200 kg) fastens itself to a spot on the reef and remains there for life.



Cowrie - *Ovula sp.*



Elongate Giant Clam - *Tridacna maxima*



Banded Coral Shrimp - *Stenopus hispidus*



White-Banded Cleaner Shrimp - *Lysmata amboinensis*



Harlequin Shrimp - *Hymenocera elegans*



Red-striped Shrimp - *Lysmata vittata*

Cleaner and banded coral **SHRIMPS** are commonly found removing parasites from fish.

The harlequin shrimp is a rare find. Its blue and white body makes it look like a prop in a science fiction movie rather than a creature on a pristine reef.

The mantis shrimp (5-25 cm) generates enough force from the lightening quick movement of its claw that its prey is hit twice: once by the claw and then by the resultant shock wave. They have sophisticated eyes and can discern 12 different colour wavelengths, nine more than the human eye.



Peacock Mantis Shrimp - *Odontodactylus scyllarus*



Banded Moray Eel - *Gymnothorax rueppelliae*

Spiny lobsters hide during the day in crevices and come out at night to feed. Other **CRUSTACEANS** live inside and around anemones, such as the decorator crab. In the same crevices where lobsters live, there could be a moray eel waiting for its prey or guarding its cave.



Painted Spiny Lobster - *Panulirus versicolor*



Orangutan Crab - *Ocinopus*



Spotted Porcelain Crab - *Neopetrolisthes maculatus*



Anemone Fish - *Amphiprion akindynos*

Anemone fish, also known as clown fish, are members of the damselfish family. Their colourful body makes them attractive to larger fish. By disappearing into the anemone, the prey is lured closer so the anemone's tentacles can catch and poison the unwary fish. The **ANEMONE FISH** is the only fish protected against the venom of the anemone because it is covered in a special mucus.



Anemone Fish - *Amphiprion akindynos*



The reefs provide a home for many exciting and exquisite **FISH SPECIES**. Many choose to hide from divers, but the Buffalo damselfish will not retreat in order to protect its garden.

Buffalo Damselfish - *Parma microlepis*



Black Saddle Toby - *Canthigaster valentini*



Neon Damsel - *Pomacentrus coelestis*



Pineapplefish - *Cleidopus gloriamaris*



Yellow Boxfish - *Ostracion cubicus*



Black-spotted Porcupinefish - *Diodon hystrix*



Stars and Stripes Toadfish - *Arothron hispidus*



Trumpetfish - *Aulostomus chinensis*



Weedy Filefish - *Chaetoderma penicilligera*



Gunther's Wrasse - *Pseudolabrus guentheri*

Straddie's fish communities are a unique mix of **TROPICAL AND SUBTROPICAL SPECIES.**

Gunther's wrasse is an example of a species that only occurs in Australia, predominantly in the subtropics.



Freckled Hawkfish - *Paracirrhites forsteri*

Butterflyfish enjoy a diet of coral polyps. More corals mean more species of colourful butterflyfish.

Many of the smaller fish are bottom dwellers while others prefer midwater. Batfish often meet divers at the anchorline.



Green Moon Wrasse - *Thalassoma lutescens*



A bommie with a myriad of tropical and subtropical species.



Crested Morwong - *Cheilodactylus vestitus*



Lyretail Anthias - *Anthias squamipinnis*



Cylindrical Sandperch - *Paraperchis cylindrica*



Roundface Batfish - *Platax teira*



Yellowfin Leatherjacket - *Meuschenia trachylepis*



Beaked Coralfish - *Chelmon rostratus*



Clown Triggerfish - *Balistoides conspicillum*



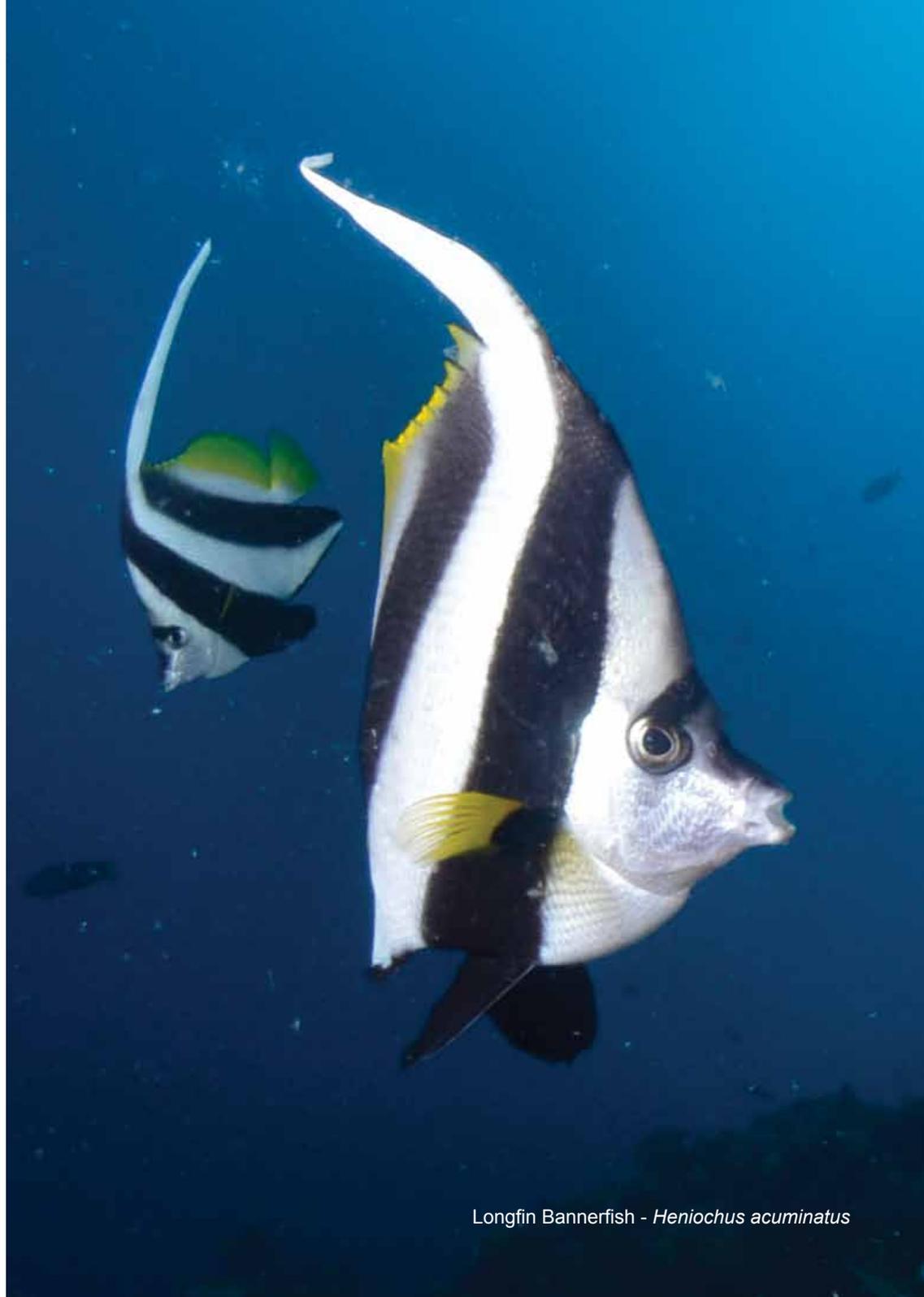
Barred Soapfish - *Diploprion bifasciatum*



Juvenile Emperor Angelfish - *Pomacanthus imperator*



Old Wife - *Enoplosus armatus*



Longfin Bannerfish - *Heniochus acuminatus*



Ornate Ghost Pipefish - *Solenostomus paradoxus*



Flying Gurnard - *Dactyloptena orientalis*



Anglerfish - *Antennarius commersani*



Rockmover Wrasse - *Novaculichthys taeniourus*

Ghost pipefish are easily mistaken for pieces of algae or broken coral. The common species are often dull in colour, while others like the ornate ghost pipefish are rewarding for underwater photographers. The frogfish is another **WEIRD AND WONDERFUL SPECIES** found on Straddie's dive sites. It doesn't swim much, but chooses to move using a combination of its pectoral and pelvic fins in a hopping movement.



Roughsnout Ghost Pipefish - *Solenostomus paegnius*



Leaf Scorpionfish - *Taenianotus triacanthus*



Cook's Scorpionfish - *Scorpaena cardinalis*

Lionfish, scorpionfish and stonefish are from the same family, and have **VENOMOUS** spines that can inflict a painful, and sometimes deadly sting. The lionfish, protected from predators by its spines, parades around the reef as if king of the marine animals. The scorpion and stonefish are masters of disguise and can blend into the rock so they may not be seen.



Estuarine Stonefish - *Synanceia horrida*



Estuarine Stonefish - *Synanceia horrida*



Common Lionfish - *Pterois volitans*



School of Eastern Pomfrets - *Schuettea scalaripinnis*

A group of fish that stays together for social reasons are shoaling. If they are swimming in the same direction in a coordinated manner they are schooling. Fish school to avoid predators and sometimes the **SCHOOLS** can be so large that it is impossible to see through them.



Catfish - *Plotosus lineatus*



Epaulette Soldierfish - *Myripristis kuntee*

The goatfish is so named because it forages through the sandy floor with its whiskers for anything edible. During the day it swims in a school for protection but feeds alone at night.



Black-spot Goatfish - *Parupeneus spilurus*



Estuary Cod - *Epinephelus coioides* cleaned by Bluestreak Cleaner Wrasse - *Labroides dimidiatus*



Queensland Grouper - *Ephinephelus lanceolatus* with diver



Sweetlips - *Plectorhinchus flavomaculatus*

Groupers, with the wisdom of many years, keep away from divers, but can be seen at cleaning stations. When being cleaned for parasites by cleaner fish and shrimps they enter a trance, and it is possible to get close. The **GROUPE**R, or cod, commonly grows to between 20 and 40 cm, but the larger Queensland grouper can mature to three metres.



Sweetlip - *Plectorhinchus unicolor*  
(background) Epaulette Soldierfish - *Myripristis kuntee*



Common Stingaree - *Trygonoptera testacea*

Most stingrays spend the majority of their time partially buried in the sand, either searching for hidden invertebrates or molluscs. Their colouration commonly reflects the seafloor's shading, camouflaging them from predatory sharks and larger **RAYs**.



Blotched Fantail Ray - *Taeniurops meyeri*

The blue-spotted stingray, despite being listed as endangered, is the most commonly sighted ray. Proportionally, this small (20-30 cm) stingray has the longest tail of the rays.

Stingrays are related to sharks and the shark ray and guitarfish are perfect examples.

Some rays, such as the eagle ray are pelagic, meaning they live in the open ocean.



Blue-spotted Stingray - *Neotrygon kuhlii*



Shark Ray - *Rhina ancylostoma*



Australian Cownose Rays - *Rhinoptera neglecta*

Eagle Rays - *Aetobatus ocellatus*



Whitespotted Wedgefish or Guitarfish - *Rhynchobatus australiae*  
with Bull Ray behind



Manta Ray - *Manta alfredi*



Manta Ray - *Manta alfredi*

The Point Lookout region is famous for **MANTA RAYS**. The Manta Ray is the largest of the rays. It can have a wingspan up to five metres and, unlike most, is never stationary. Manta Ray Bommie is so named as the rays congregate there seasonally to be cleaned. From October until April, it's common to see one or more of these magnificent creatures gliding around. Unlike other rays, mantas do not have a venomous tail and feed only on plankton. They are also comfortable swimming in and around divers and seem to enjoy having another species to play with.





Manta Ray - *Manta alfredi*  
and Blacktip Bullseye - *Pempheris affinis*



Loggerhead Turtle - *Caretta caretta*



There are five species of **TURTLES** that frequent the Point Lookout waters. The diversity of flora and fauna makes the area appealing because they enjoy a varied diet. The larger loggerhead turtles congregate at Manta Ray Bomme and Flat Rock where they like to hide with their head under a ledge. Smaller green or hawksbill turtles can be found swimming in the water column, or eating sponges on the bottom.



Green Turtle - *Chelonia mydas*



Green Turtle - *Chelonia mydas*



Brown-banded Catshark - *Chiloscyllium punctatum*



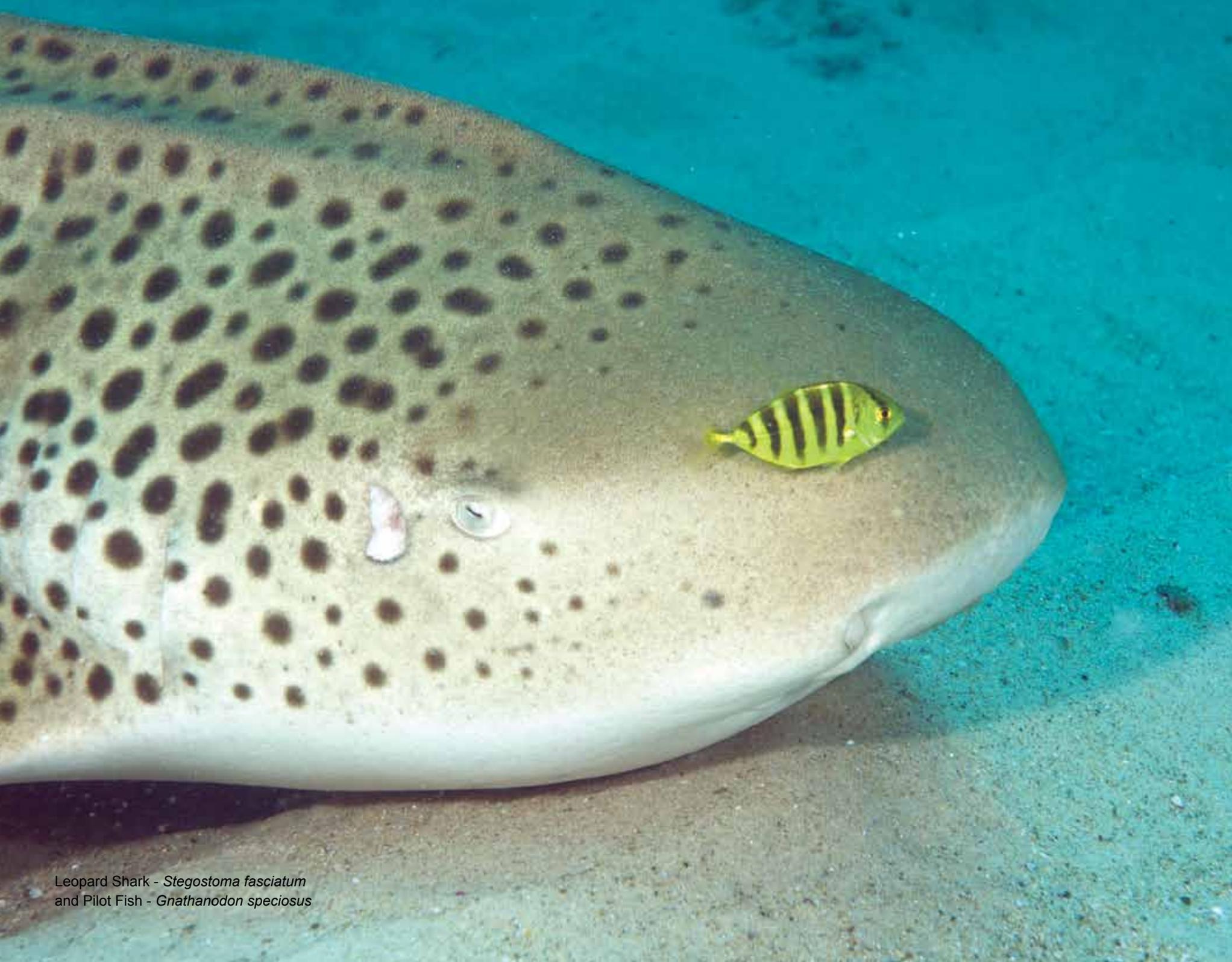
Banded Wobbegong - *Orectolobus halei*

The Point Lookout dive sites are well known for **SHARKS**. Dormant sharks like the wobbegong are plentiful across the dive sites year around while the leopard shark prefers warmer water. Leopard sharks are rarely found once the temperature sinks below 22 degrees celsius. With the colder water many grey nurse sharks come to visit.





Leopard Shark - *Stegostoma fasciatum* and  
Remoras - *Echeneis naucrates*



Leopard Shark - *Stegostoma fasciatum*  
and Pilot Fish - *Gnathanodon speciosus*



Grey Nurse Shark - *Carcharias taurus*  
and Ox-eye Scad - *Selar boops*



Grey Nurse Shark - *Carcharias taurus*

Having been hunted to near extinction along the east coast of Australia, the **GREY NURSE SHARK** is still critically endangered. Between May and November they are found in the gutters around Flat and Boat Rock.

The rows of ragged teeth make it look terrifying, however, it is not known to attack unless provoked. They're very inquisitive and will swim up close to divers.



Grey Nurse Shark - *Carcharias taurus*



Grey Nurse Shark - *Carcharias taurus*



Humpback Whale - *Megaptera novaeangliae*

Between May and October humpback **WHALES** migrate from the colder water of the Antarctic to the warmer waters north. They are commonly sighted on the surface during a trip out to the dive sites. However, only a few divers are fortunate enough to dive with these gentle giants. Most will only hear their singing, which can be heard from kilometres away.



Humpback Whale - *Megaptera novaeangliae*



Humpback Whale - *Megaptera novaeangliae*



Humpback Whale - *Megaptera novaeangliae*

Sitting at Point Lookout it's possible to see **WHALES**, turtles, dolphins, manta rays and sharks. Even seals have been observed during the winter months.





Humpback Whale - *Megaptera novaeangliae*



Indo-Pacific Bottlenose Dolphins - *Tursiops aduncus*

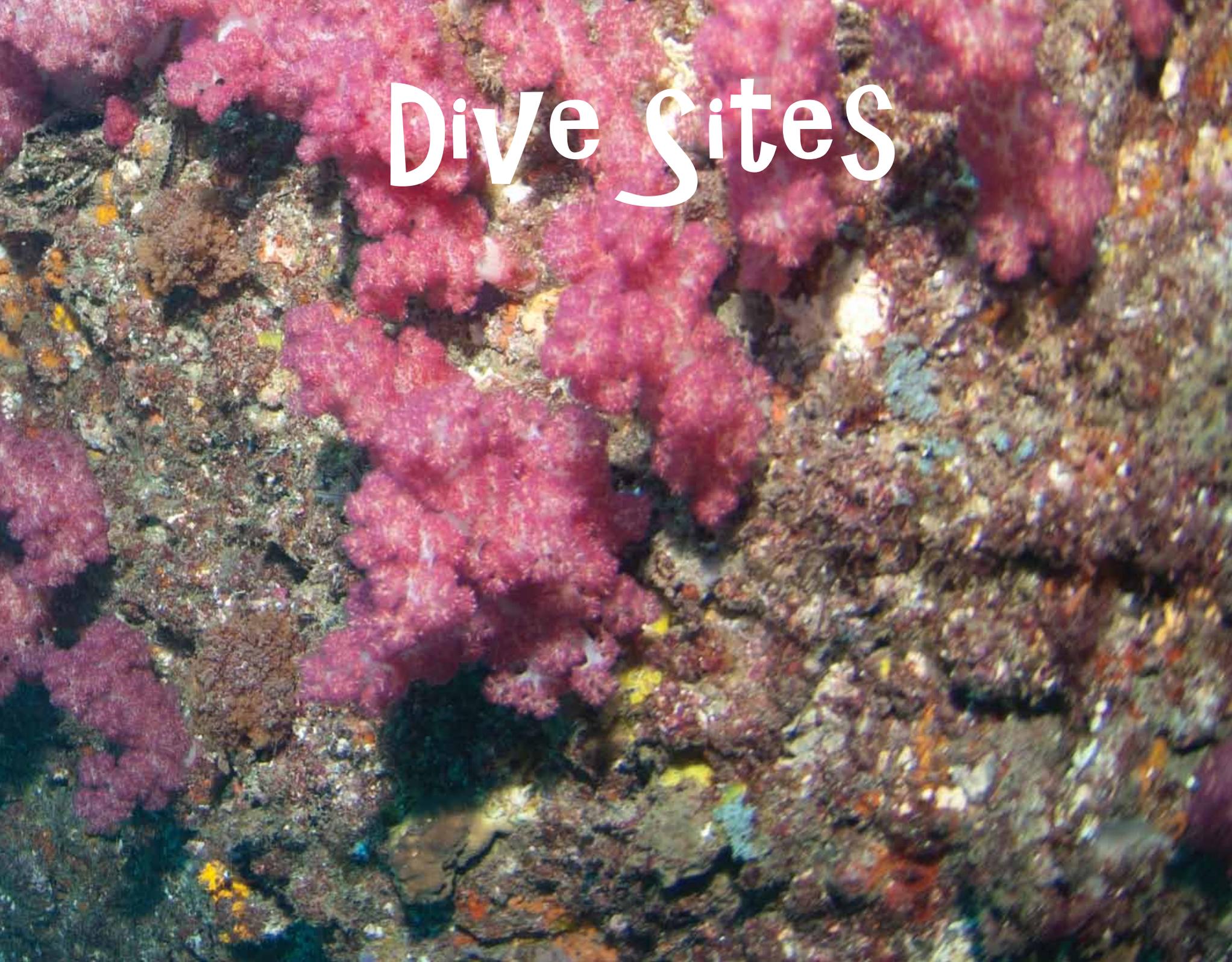




Indo-Pacific Bottlenose Dolphins - *Tursiops aduncus*



# Dive Sites



# EXPERIENCE THE DIVE SITES

## North Stradbroke Island

Grey nurse sharks in the winter or manta rays in the summer? Divers are often posed with this question when choosing what time of year to dive at Straddie. There are five rocky reefs within a square mile: Shag Rock, Flat Rock, Boat Rock, Mid Reef and Manta Ray Bommie. Despite their proximity, each has its own traits with differing wind and wave patterns, currents, tides and depth. Each reef is uniquely characterised by its marine life, with a number of different dive sites for divers to explore. Visibility can vary between five and 25 metres with the sites closer to shore rarely experiencing more than 15 metres.

At Flat and Boat Rock, depths of 35 metres can be found on the edges of the rocky systems, while Mid Reef drops off to 25 metres. Shag Rock and Manta Ray Bommie are shallower dive sites with the majority of sea life at ten



metres, but the depth reaches 18 metres on the sandy bottom surrounding the sites. Due to these ecological differences the dives sites vary in their composite flora and fauna. The larger pelagic fauna prefer Flat and Boat Rock, but during the summer can be observed at Manta Ray Bommie.



The dive sites are accessible by launching from the nearby beaches using the island's dive operators. Other dive boats launch from mainland harbours and the journey takes approximately 90 minutes. There are only moorings at Flat Rock, which has four spaced around it.



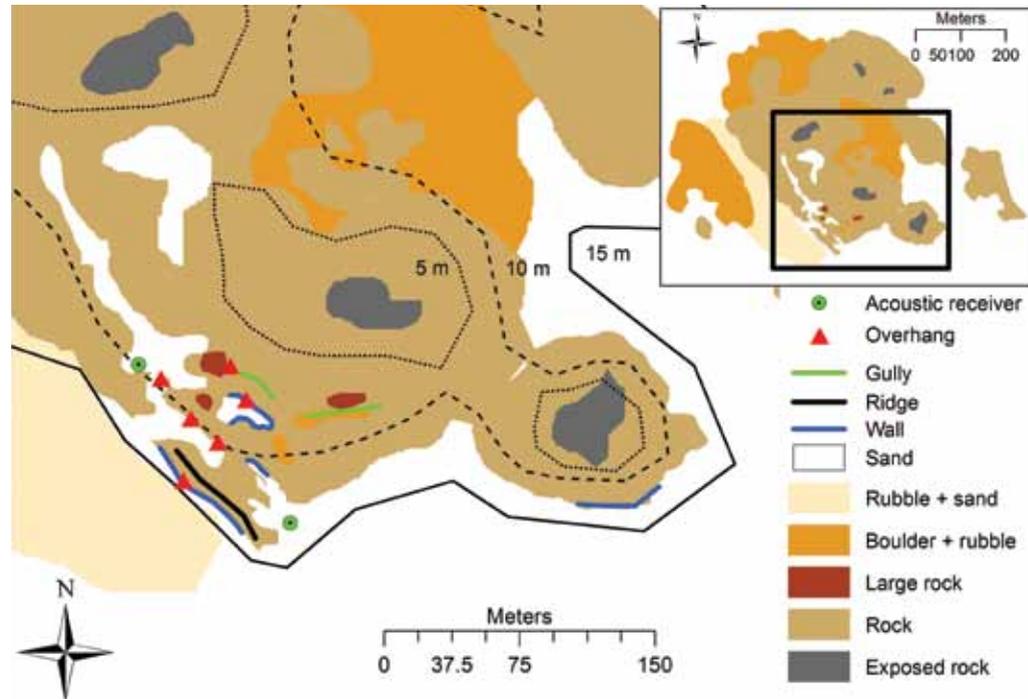
# Manta Ray Bommie

## Manta magic

The rocks closest to the island (10 minutes by boat), known as The Group, has one main dive site: Manta Ray Bommie. Its proximity to the headland means it is only protected from westerly winds. A strong northerly, long shore current can be present in the deeper water (15 metres) between The Group and the shore. On the surface the predominantly southerly swell creates an opposing movement of water. This confluence can quickly create unfavourable conditions for safe anchoring and diving. The water movement in combination with the local cleaning station, makes it an aggregation site for manta rays in the summer, with sometimes up to six seen on a dive. On calm days the shallowness of the site makes it suitable for beginner divers.

Manta rays prefer the warmer waters between October and April and never seem to be perturbed by divers who've come to watch their graceful movements. Leopard sharks also prefer warmer water and the site is renowned for being one of the largest aggregation sites for this species in the world. Unlike the restless manta ray, it is common to find the leopard sharks sleeping on the sandy floor.

The water movement and temperature, the cleaning station, and surrounding food source make the site a perfect retreat for the various megafauna. As a result the site turns into a megafauna zoo during the summer months and is considered one of the top dive sites in Queensland.



Manta Ray Bommie

### MANTA RAY BOMMIE

A collection of bommies with sandy patches and a drop off beyond a ridge on the southwest side to 15 m. Swim northwest using the shallow water (5 m) currents, and southeast with the opposing current in deep water (15 m), keeping the ridge on the left.

- Marine life: Manta rays, leopard sharks, turtles, eagle and cowtail rays (summer), tropical fish and algae.
- Diver level: OWD
- Conditions: Dangerous swell close to rocks in shallow water and strong currents in deeper water.
- Dive depth: 5-15 m (max 18 m)

# Flat Rock

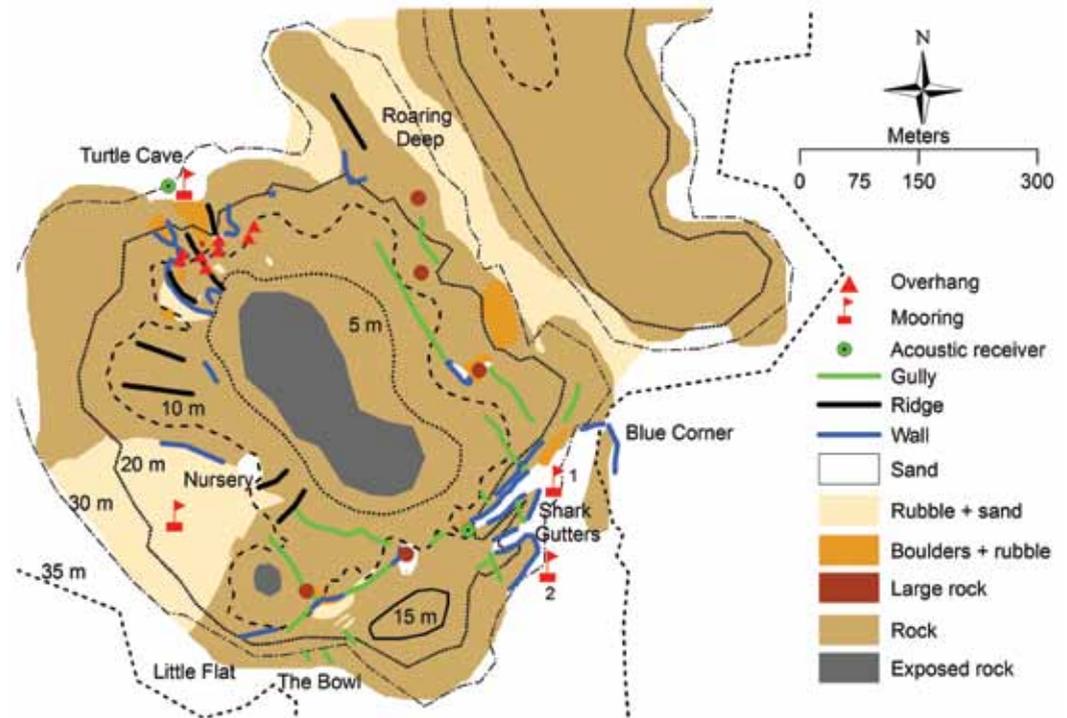
## Shark encounter

Flat Rock is located 15-20 minutes by boat from the beach. The rock rises up from 35 metres and is exposed as two flat rocks; the smaller named Little Flat. There are five main dive sites: Turtle Cave, Blue Corner, Shark Gutters, Little Flat and the Nursery; others are Roaring Deep and The Bowl.

Flat Rock is recognised as one of the major aggregation sites in South East Queensland for grey nurse sharks. Sightings of 30 of the fearsome looking creatures have been recorded on some dives. For this reason, Flat Rock is completely protected and no fishing or anchoring is allowed. Although the grey nurse sharks are docile, divers need to consider their code of conduct when diving with them. In winter, male sharks contest for female sharks and can be jittery. It isn't uncommon for them to snap their tail, which reverberates through the water and surprises divers. They are most frequently spotted in the deeper waters at Shark Gutters, Blue Corner and Turtle Cave.

In the deeper water it is not unusual to see bull sharks, or the occasional great white or tiger shark. Humpback whales pass close to this rock when migrating and can often be seen from the boat, and heard underwater. A few divers have even had the pleasure of diving with these magnificent creatures. Killer whales have been seen following some of these mammals on their annual pilgrimage north.

Due to the water movement around the rocks there can be a strong current from Turtle Cave to Little Flat. If familiar with strong currents, an experienced diver can enjoy an exciting drift dive. During king tides the water movement can be too strong for non-drift dives.



## SHARK GUTTERS

One large gutter (5 m wide x 50 m long) with smaller gutters in various directions. Dramatic steep rock faces and overhangs. Navigate west from mooring 1 and north from mooring 2 to get to the area. In clear water the underwater landscape is spectacular.

Marine life: Grey nurse sharks and whales (winter), cownose, bat and eagle rays, Queensland groupers, turtles, and schools of pelagic fish.

Diver level: OWD in calm weather

Conditions: Currents in shallows close to rock.

Dive depth: 15-24 m (max 30 m)



## LITTLE FLAT / THE BOWL

No mooring. Dramatic landscape with large boulders and a steep rock face to 35 m.

Marine life: Large schools of fish, moray eels and turtles in shallow waters, pelagic fish in the currents, reef sharks often lying on the bottom in deeper water.

Diver level: OWD in calm weather

Conditions: Strong currents occur on the westerly side.

Dive depth: 15-20 m (max 35 m)



## TURTLE CAVE

Mooring located at 27 m. Navigate east from the mooring towards the rock, over an area covered in big boulders, to the cave at 15 m.

Marine life: Grey nurse sharks (winter), Queensland grouper, leopard and bull sharks in deeper water. Large pelagics (e.g. eagle rays, banner and batfish) in the water column. Lots of soft coral.

Diver level: OWD in calm weather

Conditions: Strong currents could occur in the shallows close to the rock.

Dive depth: 15-20 m (max 30 m)



## BLUE CORNER

Mooring located at 27 m. Navigate northeast from mooring 1, keeping the rock on the left while descending into deeper waters. At 30 m a ridge drops to 35 m. In clear water with strong currents the marine life can be amazing.

Marine life: Grey nurse sharks and whales (winter), bull sharks, turtles, rays, and schools of pelagic fish.

Diver level: Experienced

Conditions: Currents in the shallows close to the rocks and in deep water.

Dive depth: 25-35 m (max 40 m)



## NURSERY

Mooring located at 18 m. Navigate northeast towards the rock following the big boulders. The flat landscape is a bustling world of fish life.

Marine life: Large schools of small fish, turtles, invertebrates, soft coral at 18 m and the occasional shark.

Diver level: OWD in calm weather

Conditions: Currents in deeper water.

Dive depth: 5-15 m (max 20 m)

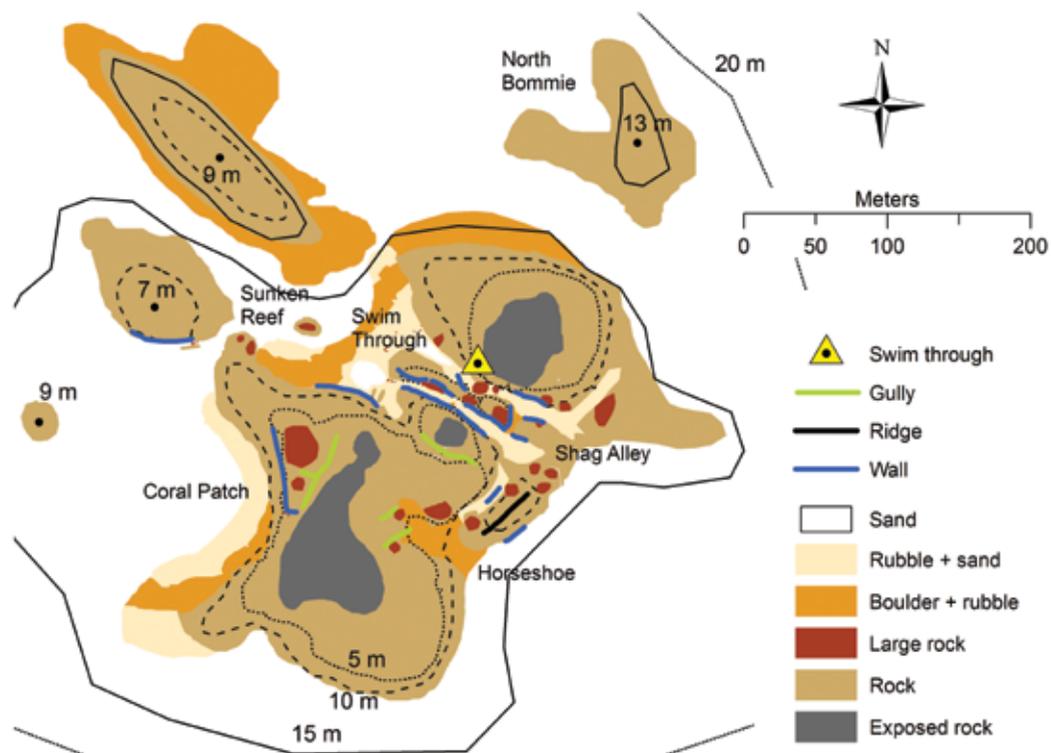
# SHAG ROCK

## Coral enchantment

This site is named for the Shag bird colonies on the exposed rock. The most accessible and sheltered of the rocky reefs, it takes about 5-10 minutes from the beach. The rock has several main dive sites: Horseshoe, Swim Through, Coral Patch, and Shag Alley; others are Sunken Reef and North Bommie.

Protected by the Point Lookout headland and situated on the shallower platform rising up to the mainland, the site generally escapes the strong tidal currents and southerly water movement. As a result it can be dived in all conditions, except the strong northerly winds that sometimes come at the end of summer. Shag is commonly used for beginner divers, specialty courses and night diving, although its position often means visibility is less than at Boat or Flat Rock.

The site has some exciting swim throughs and prominent rock features to interest experienced divers. All divers need to be aware of the camouflaged stone fish and numerous sea urchins on the site. Shag Rock is not a protected zone and fishing and anchoring is allowed.



### HORSESHOE / SANCTUARY COVE

A cove filled with big boulders, small gullies and a large rocky reef. Sandy bottom starts at 12 m.

Marine life: Hard and soft corals, algae, feather worms, nudibranchs, mantis shrimps, small fish, big schools of fish, wobbiegong sharks

Diver level: OWD

Conditions: Little or no currents

Dive depth: 5-12 m

### CORAL PATCH

A sandy area with boulders overgrown with coral.

Marine life: Rocks overgrown with algae, branching and soft corals. Feather worms, collector urchins, mantis shrimps, small fish, schools of fish, wobbiegong sharks. Watch out for stone fish and sea urchins.

Diver level: OWD

Conditions: Little or no currents

Dive depth: 5-12 m



Coral Patch



Swim Through

### SWIM THROUGH & SHAG ALLEY

Boulders in 10 m rising up to the main rock. Gutters running west to east, with a narrow swim through ending in a steep gully. The north wall of the gully is completely covered in soft coral.

- Marine life: Soft corals in gully, lobster, collector urchins, mantis shrimps, large schools of fish, wobbiegong sharks
- Diver level: OWD
- Conditions: Little or no currents except in the gullies and swim through.
- Dive depth: 5-12 m (max 15 m)

## Boat Rock

### Mysterious waters



Boat Rock

Boat Rock is the smallest of the exposed rocks and rises sharply from 30 metres. The pinnacle forces water to move around it and diving is only possible under limited conditions or when experienced. Divers can see large schools of eagle rays swimming in the current. The site is characterised by a cavern at 25 metres at the bottom of the steep wall. In or around the cavern, Queensland groupers and grey nurse sharks can be seen.

### BOAT ROCK

Steep rock face, dropping to 30 m with a plateau at 20 m on the southeast side. Keep the rock on the left while navigating at 25 m northwest, returning in shallower water with the rock on the right.

- Marine life: Eagle rays, Queensland groupers, tropical fish.
- Diver level: Experienced
- Conditions: Steep descent, usually strong current throughout the water column.
- Dive depth: 20-25 m (max 30 m)

## Mid Reef

### Fish soup



Mid Reef

This rocky reef is halfway between Shag and Flat Rock and is the only reef that is completely submerged. There are several gullies traversing southwest to northeast, which are home to large schools of fish and the occasional Queensland grouper or potato cod. The rock is overgrown with turf algae, macro algae and encrusting coral. Strong surface currents make descents challenging. Divers are able to sight pelagic fish swimming in midwater.

### MID REEF

Submerged rock, top at 15 m, bottom at 25 m, with some small gullies. Rarely dived by tour operators because of the challenging conditions.

- Marine life: Algae and coral, pelagic fish, large cod, wobbiegong sharks, schools of fish, rays in the sand
- Diver level: Experienced
- Conditions: Stronger currents while descending
- Dive depth: 15-25 m



Caring for our  
UNIDIVE  
**PLEA**  
Volunteer Research 2014



# Caring For our Reefs



Reefs  
2013 - 2014  
SIBELCO  
SEA

## Protecting Straddie Reducing impacts



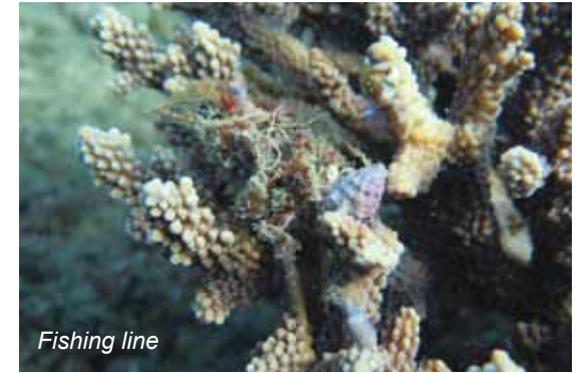
*Coral damage*

No matter where corals live, they are sensitive to environmental factors, making them excellent indicators for environmental changes and stress. In addition to the natural influences occurring in South East Queensland (SEQ), such as extreme temperature fluctuations and changes in water chemistry, human activities can cause stress on reef systems. Reefs exist in a delicate and complex state of balance and while they are accustomed to occasional impacts such as violent storms or floods, it is the continuous and often overlapping human impacts that truly threaten reef sustainability.

The rapidly growing SEQ population continually places our reefs under ever-increasing pressure. Coastal and catchment development areas increase the levels of siltation and chemicals affecting the water quality of Moreton Bay. This can stagnate coral development and increases the area for algae to grow.



*Marine Parks mooring*



Every reef organism has a role to play. Collection of fish and other key reef organisms (like sea cucumbers or banded coral shrimp) can change reef dynamics and alter essential processes that keep reefs functioning. Removal of top predators (sharks or large carnivorous fish) has cascading effects down the food chain. Removing herbivorous fish or other grazers, such as urchins, can give algae a chance to take over reef habitats.

Corals can appear bleached, which is a sign that they are stressed. Coral bleaching occurs when the relationship between the coral polyps and the tiny algae (zooxanthellae) breaks down. Once this occurs, the coral loses the zooxanthellae and becomes paler, giving it a 'bleached' appearance. Often the stress is due to abnormal temperature variations (too hot, or too cold) or changes in water chemistry. If the stressor is removed, corals can recover from bleaching and reabsorb zooxanthellae, but if the stress continues, then the coral dies.

Coral disease is another sign of stress. As with humans, when immunity is reduced, risk of disease increases. The disease eats away the coral tissue, leaving a skeleton behind. Corals also receive damage to their skeleton from anchors, waves and currents, and careless divers or

snorkelers. Extensive damage from any of the above factors can reduce habitat complexity, which means less shelter and food for the sea life supported by coral ecosystems.

Reef systems are susceptible to marine debris. Many reefs have fishing lines, crab pots and other refuse that can have serious consequences for sea life.

### **We can all play a role in protecting reefs**

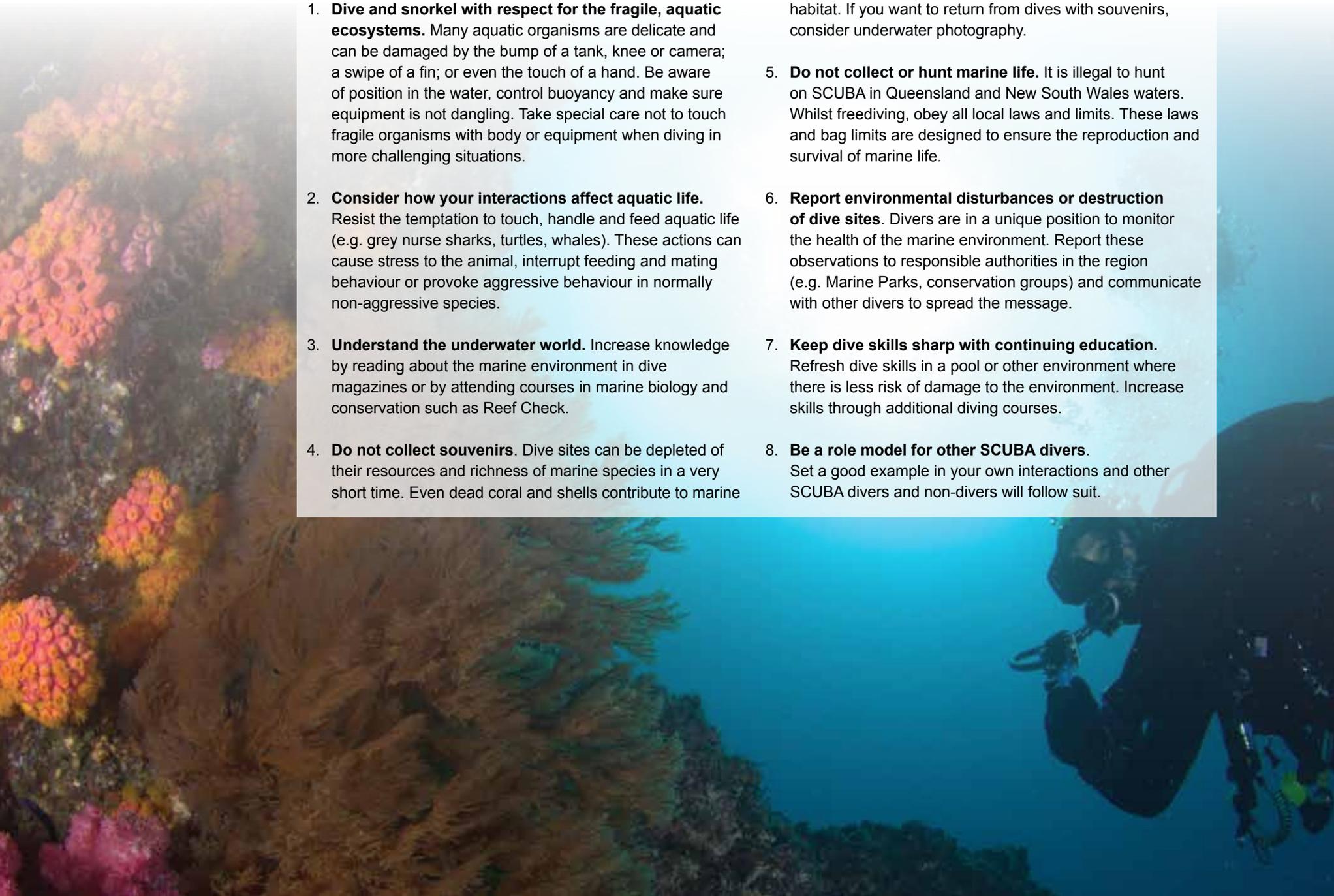
As lovers of the marine environment we can support the organisations that work towards protecting the reef by providing input to government agencies that manage and maintain the coastal waters.

Fishing and other boating activities should be conducted in appropriate zones according to existing regulations. Skippers should seek the installation of moorings in highly visited areas, and if possible anchor on sand rather than the reef.

As responsible citizens our commitment to ensuring the protection of our marine environment can go beyond just changing our behaviour when diving or boating. We can help reduce global warming by turning electric devices off when not in use, riding a bike or sharing a car, printing less paper and practicing recycling techniques.

## Following Divers' Code of Conduct

1. **Dive and snorkel with respect for the fragile, aquatic ecosystems.** Many aquatic organisms are delicate and can be damaged by the bump of a tank, knee or camera; a swipe of a fin; or even the touch of a hand. Be aware of position in the water, control buoyancy and make sure equipment is not dangling. Take special care not to touch fragile organisms with body or equipment when diving in more challenging situations.
2. **Consider how your interactions affect aquatic life.** Resist the temptation to touch, handle and feed aquatic life (e.g. grey nurse sharks, turtles, whales). These actions can cause stress to the animal, interrupt feeding and mating behaviour or provoke aggressive behaviour in normally non-aggressive species.
3. **Understand the underwater world.** Increase knowledge by reading about the marine environment in dive magazines or by attending courses in marine biology and conservation such as Reef Check.
4. **Do not collect souvenirs.** Dive sites can be depleted of their resources and richness of marine species in a very short time. Even dead coral and shells contribute to marine habitat. If you want to return from dives with souvenirs, consider underwater photography.
5. **Do not collect or hunt marine life.** It is illegal to hunt on SCUBA in Queensland and New South Wales waters. Whilst freediving, obey all local laws and limits. These laws and bag limits are designed to ensure the reproduction and survival of marine life.
6. **Report environmental disturbances or destruction of dive sites.** Divers are in a unique position to monitor the health of the marine environment. Report these observations to responsible authorities in the region (e.g. Marine Parks, conservation groups) and communicate with other divers to spread the message.
7. **Keep dive skills sharp with continuing education.** Refresh dive skills in a pool or other environment where there is less risk of damage to the environment. Increase skills through additional diving courses.
8. **Be a role model for other SCUBA divers.** Set a good example in your own interactions and other SCUBA divers and non-divers will follow suit.



## Monitoring Flora and Fauna

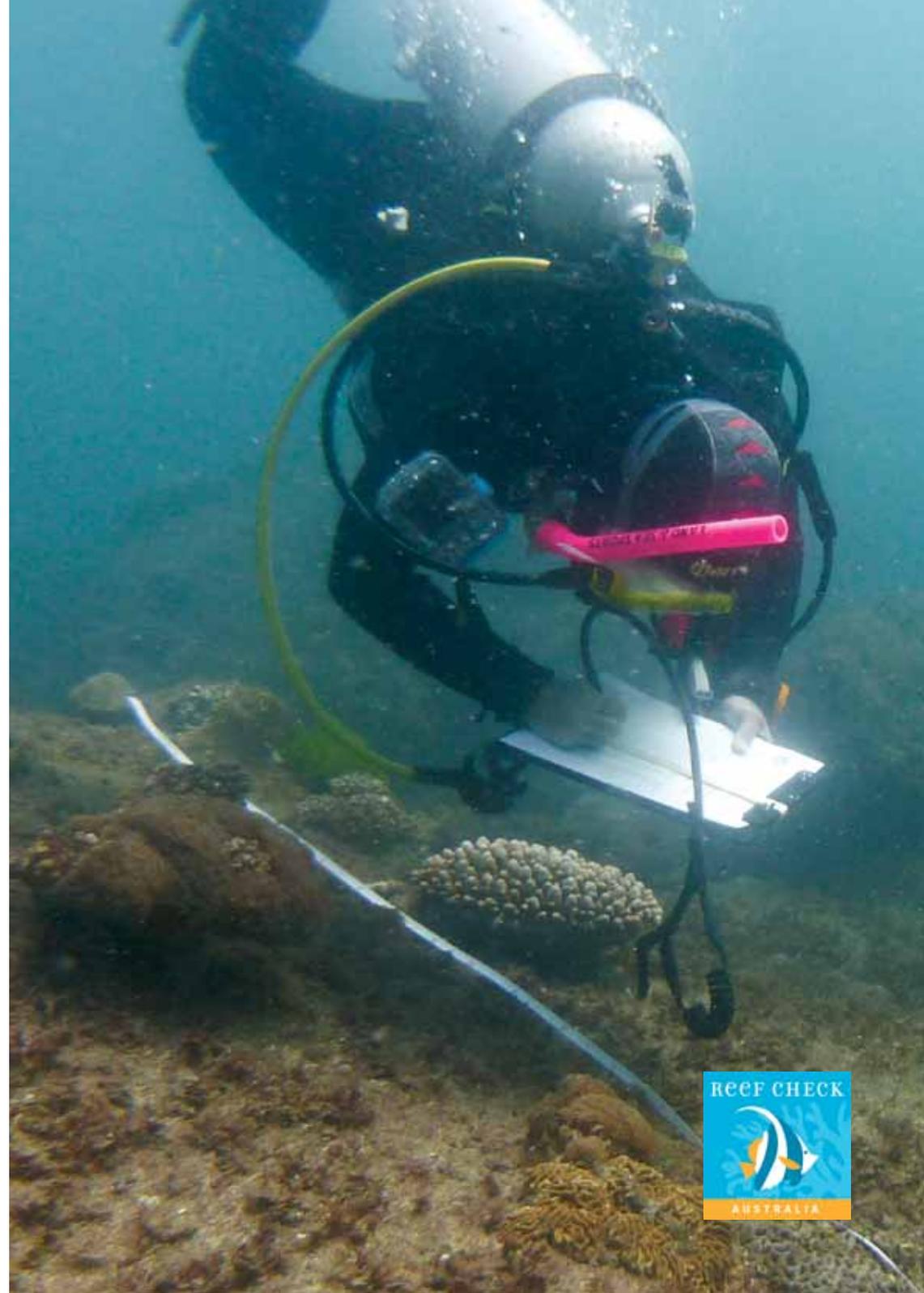
Reef Check Australia is an environmental charity dedicated to protecting Australia's reefs and oceans by engaging the community in hands-on citizen science and education initiatives. Our teams are part of a worldwide network of trained volunteers that regularly monitor and report on reef health in more than 90 countries using the standardised Reef Check scientific survey method.

The subtropical reefs in Moreton Bay are unique marine environments. If we want to protect these well-loved places, then data sets that help build knowledge about their habitats, diversity and threats are essential. We believe volunteers can play a key role in helping to collect useful, scientific data; as well as working collaboratively with the community, natural resource managers, educators and scientists to ensure the future of Moreton Bay's reefs.

Our Reef Check Australia teams visit four sites at Shag Rock and Flat Rock annually. Beyond offering comparisons to the 2001 Coastcare initiative, data from the PLEA project expands on the information collected by our teams by generating comparable data and increasing layers of spatial, temporal and species data available. We look forward to continuing to support the efforts of the UniDive volunteers in protecting the future of Stradbroke Island's rocky reefs.

### Join Reef Check Australia

Get involved and help us better understand and protect Australian reefs. Reef Check Australia is always looking for volunteers. Experienced divers can join the team by participating in Reef Check Australia diver training and reef health surveys. Any snorkelers and divers can get involved in our REEFSearch program.





## Measuring Coral Health

There are not enough scientists to monitor all the world's reefs. The Coral Health Chart provides an easy and consistent way for volunteers to measure the changes in colour from coral bleaching.

The health of coral can be assessed by its colour. When corals become stressed, the symbiotic relationship they have with the microscopic algae (zooxanthellae) breaks down. The algae leave their host, making the coral paler in colour. The different colours on the Coral Health Chart correspond to the changing density of the algae living in the coral tissue. Corals can recover from bleaching and monitoring should happen at all times.

Scientists developed the chart in 2002 and since then thousands of individuals and organisations have contributed to the CoralWatch global database. All data is available online and provides vital information to scientists and managers about patterns of bleaching around the world.

Anyone can help to monitor reefs. You don't need extensive training – just download a Do it Yourself Kit, request a Coral Health Chart, and you are ready to go. Get involved to help protect the future of our reefs.

### How to use the Coral Health Chart

1. Choose a random coral colony and select the lightest area.
2. Rotate the chart to find the closest colour match, avoiding the tip of branching corals.
3. Record the matching code on a slate or data sheet.
4. Now select the darkest area within the same coral colony, and record the matching code.
5. Record the coral type.
6. Continue monitoring other corals.
7. Upload the data to the website.



# Identifying Megafauna



### Identify leopard sharks

Over a period of three years, researchers conducted photo-ID surveys at Manta Ray Bommie and identified 327 individual leopard sharks. From this data they estimated that approximately 460 leopard sharks visit the site each summer. This makes Manta Ray Bommie the largest known aggregation site for leopard sharks in the world. There are even photographs of an individual leopard shark encompassing an eight-year period.

#### How to take a photo-ID shot and contribute:

- Take full body shots of the shark's LEFT side. The right side is also useful but sharks are not symmetrical
- Note the date, time and location of the photo
- Include the name of the photographer
- Provide details on shark behaviour, temperature, and other animals around.



### Be part of project MANTA

In Australia, manta rays are a common sight to swimmers, snorkelers, and divers. Yet we don't know much about them. Project Manta is rectifying this by engaging the public for support and if a new individual is identified from your photos, you get to name your own manta. This is an opportunity to be involved in the scientific study of manta rays and contributing to the long-term monitoring of the manta's environment.

#### How to take a photo-ID shot and contribute:

- Take photos or video recordings of the manta ray's belly
- Note the date, time and location of the photo
- Include the name of the photographer
- Provide any photos of manta rays from previous years (with date and location).



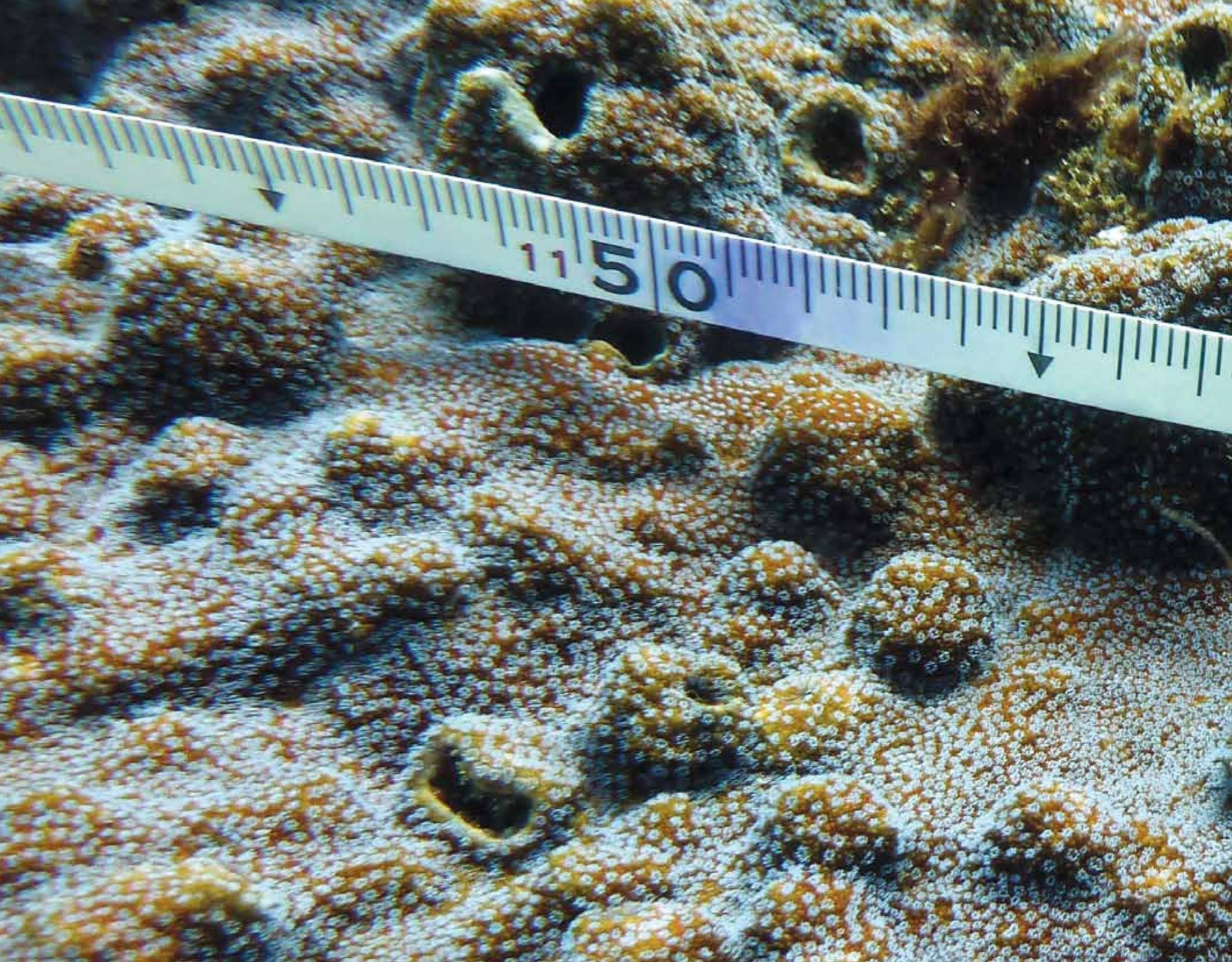
### Help protect the Grey Nurse Shark

Grey Nurse Shark Watch is a community-monitoring program in NSW and QLD. It is designed to capture data on grey nurse shark numbers and distribution during different stages of their life cycle. Grey nurse sharks are identified by their unique spot patterns on their side. Photographs submitted by divers contribute to a national database on the grey nurse shark, which is available to stakeholders, researchers and managers. Data can contribute towards methods to help ensure the survival of this species.

#### How to take a photo-ID shot and contribute:

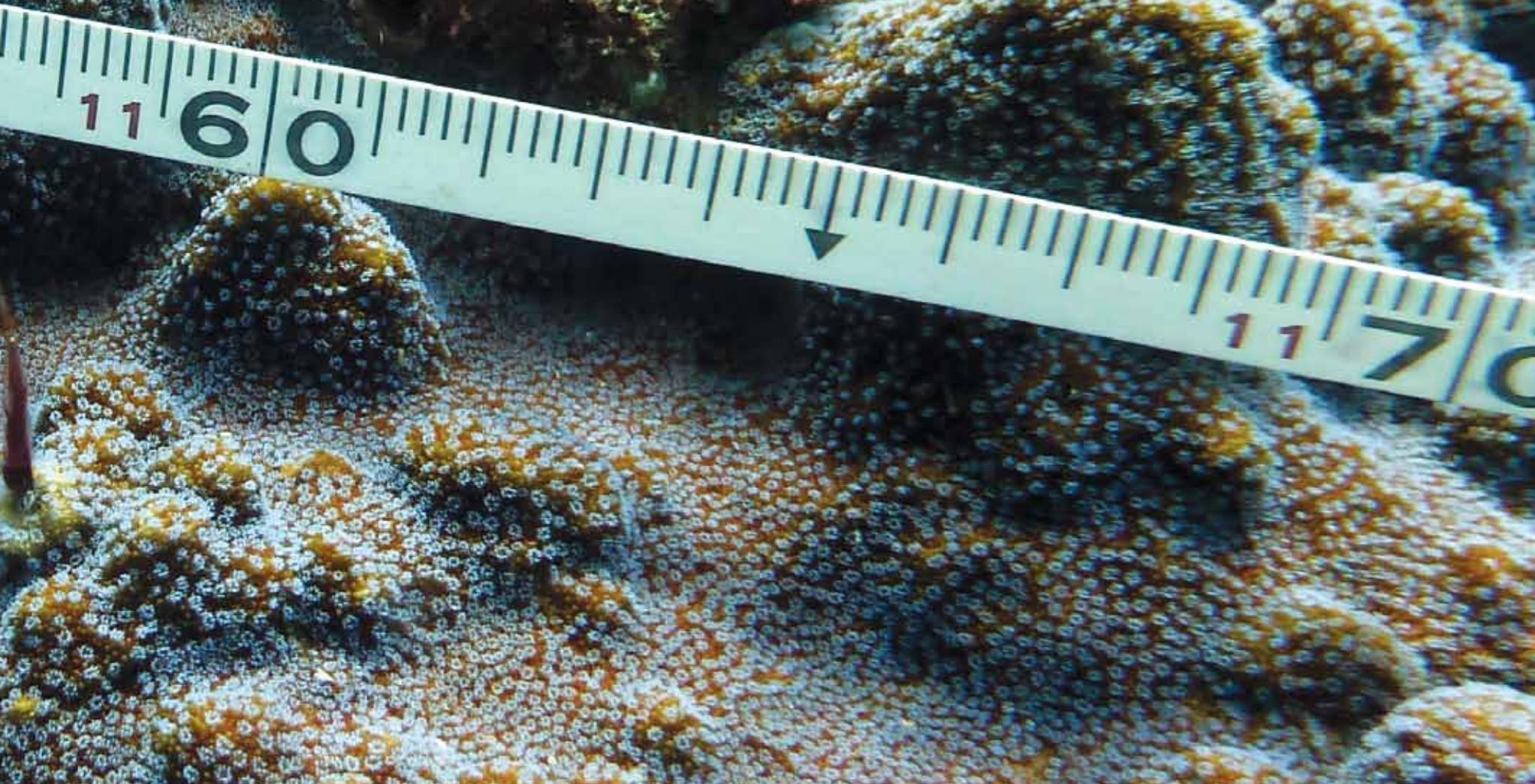
- Take clear side photos
- Note the date, time and location of the photo
- Include the name of the photographer
- Provide details on sex, scars, length, and anything else of interest (e.g. fishing hooks).





# PLEA

Point Lookout Ecological Assessment



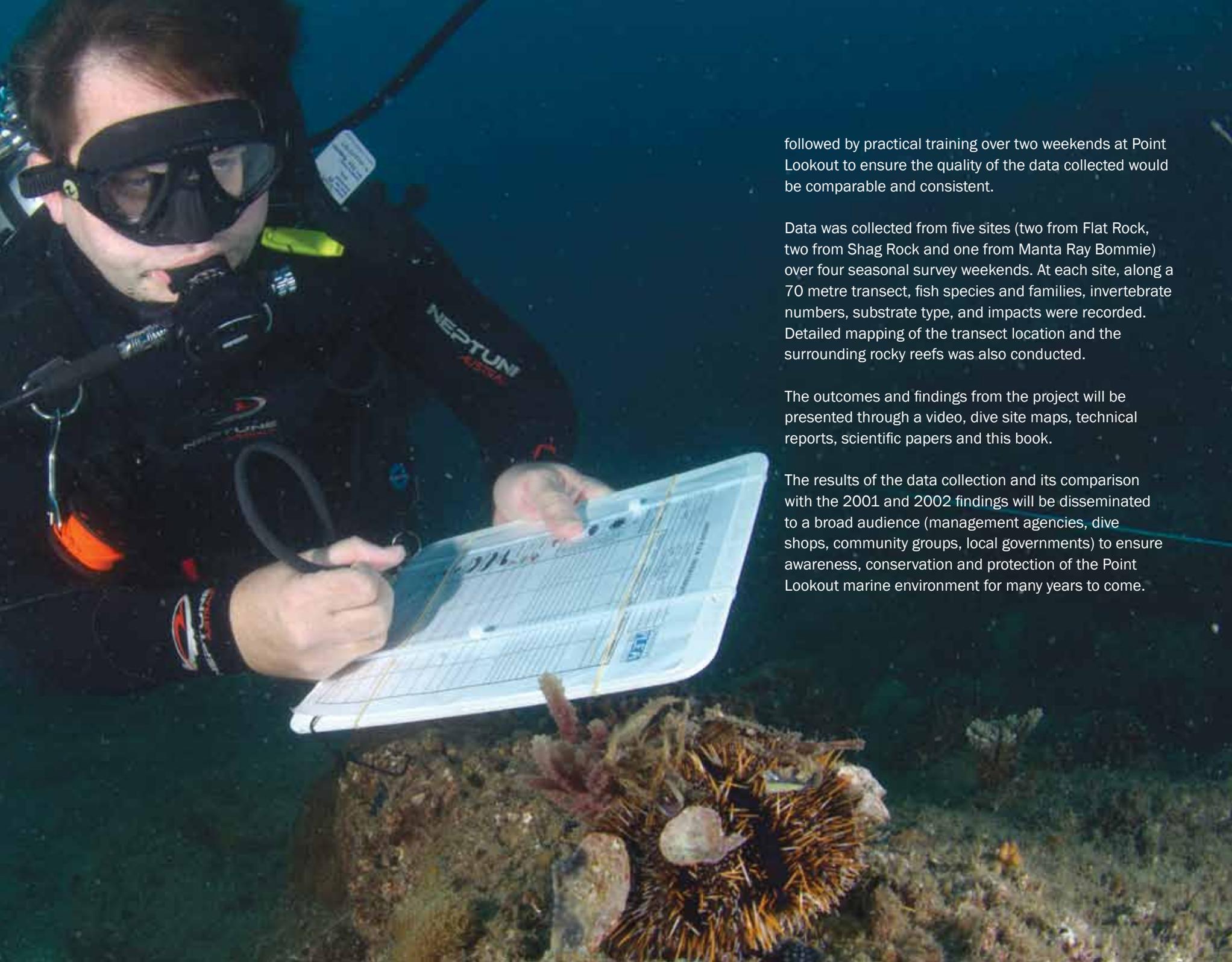
## PLEA Point Lookout Ecological Assessment



The Point Lookout waters support a wealth of marine flora and fauna, making it a world-class diving location. Recreational pursuits such as diving, commercial fishing and other human or natural impacts may be affecting the ecological health of the area. In 2001, the University of Queensland's Underwater club, (UniDive) was funded by Coastcare to perform a base line assessment of the flora and fauna of three of the popular dive sites. The following year, UniDive mapped Flat Rock in detail as part of a Threatened Species Network supported project. Since then there has been an increase in recreational usage at the dive sites, new management strategies (e.g. introduction of moorings and no fishing areas); and several major natural impacts (e.g. 2011 Queensland flood). This motivated UniDivers to consider how the area had changed.

In October 2013, the Point Lookout Ecological Assessment (PLEA) project began with the training of volunteer divers from UniDive. The training included academic sessions on reef ecology; flora, fauna and impact identification; survey and mapping techniques; video and photography tips; data analysis and publication. Prior to the first data collection weekend, 45 volunteer divers sat an academic exam



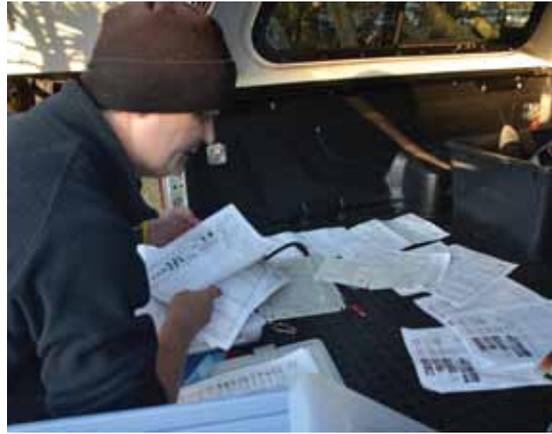
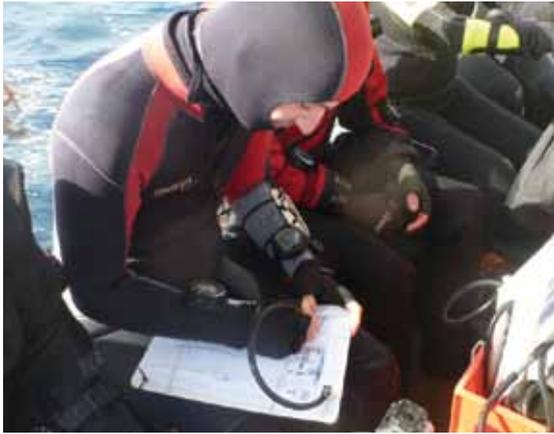


followed by practical training over two weekends at Point Lookout to ensure the quality of the data collected would be comparable and consistent.

Data was collected from five sites (two from Flat Rock, two from Shag Rock and one from Manta Ray Bommie) over four seasonal survey weekends. At each site, along a 70 metre transect, fish species and families, invertebrate numbers, substrate type, and impacts were recorded. Detailed mapping of the transect location and the surrounding rocky reefs was also conducted.

The outcomes and findings from the project will be presented through a video, dive site maps, technical reports, scientific papers and this book.

The results of the data collection and its comparison with the 2001 and 2002 findings will be disseminated to a broad audience (management agencies, dive shops, community groups, local governments) to ensure awareness, conservation and protection of the Point Lookout marine environment for many years to come.



The University of Queensland Underwater Club (UniDive) was established in 1965. In 2014, there are approximately 350 members of which +65% are UQ students or staff. Many focus their studies or research on the marine environment, and have experience in planning, data collection, analysis, reporting and scientific writing.

Another **UNIDIVE** experience

THE UNIVERSITY OF QUEENSLAND UNDERWATER CLUB





### INTERESTING FACTS

- 25 presentations and workshops
- 2 training weekends
- 4 survey weekends
- 10000 photos
- 600 minutes of video
- 100 participants
- 614 oranges
- 45 trained divers
- 45 divers collected data
- 650 dives
- 430 hours underwater
- 100 data parameters collected
- 1000 data values collected
- 12000 volunteer hours
- 10000 emails



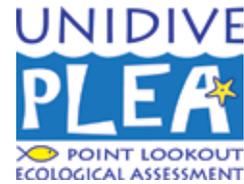
# Supporters

## The PLEA team would like to thank the following organisations for their contribution to the project:

- Redland City Council is proud to provide funding for the PLEA project as part of the Community Grants Program to assist the Redlands Community
- Sibelco Australia Mineral Sands provided support through its Community Development Program
- Stradbroke Ferries provided transport for training and survey weekends
- Point Lookout SCUBA Charter, Ken Holzheimer for discounted dives and accommodation

## General support

- The University of Queensland: School of Geography, Planning and Environmental Management; Biophysical Remote Sensing Group; Centre for Marine Science; Shark and Ray Research Group; Moreton Bay Research Station; CoralWatch
- Manta Lodge and Scuba Centre
- Queensland Cyber Infrastructure Foundation (QCIF)
- Reef Check Australia
- Grey Nurse Shark Watch
- Village Meats of Toowong
- Quandamooka Land Council



# Participants

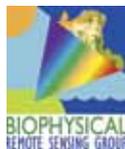
## Contributors to the PLEA project:

**Core divers:** Aaron Aeberli, Trevor Barrenger, Liette Boisvert, Craig Bolland, Ryan Booker, Roxane Borruat, Gavin Bott, Peran Bray, Dunia Brunner, Sarah Buckley, Jenni Calcraft, Olivier Cheneval, Robert Cook, Donna Easton, Stefano Freguia, Michele Gallo, Karen Johnson, Beth Kita, Diana Kleine, Julie Klint, Eva Kovacs, Justin Mariner, Bruce McLean, Melanie Oey, Dee Passenger, Josh Passenger, Michael Pheasant, Lachlan Pollard, Lee Raby, Alyssa Ryan, James Sadler, Mark Stenhouse, Douglas Stetner, David Warren

**Trainers:** Maria Beger, Christine Dudgeon, Jason Flower, K-Le Gomez, Alexandra Lea, Jennifer Loder, Juan Ortiz, Chris Roelfsema, Megan Saunders, Ruth Thurstan

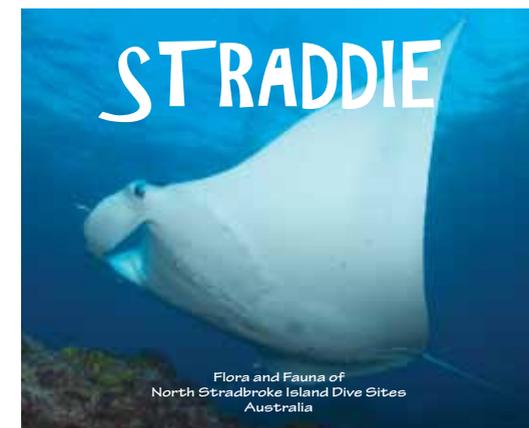
**Other support:** Joanne Edkins, Andy Findlay, Wayne Freeman, Blair Jedras, Zara Passenger, Lockie Passenger, Eric Peterson, Konrad Peterson, Magnus Peterson, Nina Pheasant, Felix Pheasant, Djoy Roelfsema, Anouk Roelfsema, Pieter Truter

**UniDive Committee:** Jimi Bursaw, Jonathan Chong, Stacey Davies, Daniel Yeow



## This publication would not have been possible without the contribution of the following people:

Authors: Lachlan Pollard, Chris Roelfsema, Diana Kleine  
 Contributing writers: K-le Gomez-Cabrera, Jennifer Loder  
 Cartographers: Mike Pheasant, Douglas Stetner, Lachlan Pollard, Trevor Barrenger, Lee Raby  
 Graphic design: Diana Kleine  
 Species identification: Maria Beger, Christine Dudgeon, K-le Gomez-Cabrera  
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## Photography

COVER	23	Chris Roelfsema	40	(all) Chris Roelfsema	70-71	Lock Pollard
(front cover) Chris Roelfsema	24	(background) Douglas Stetner	41	David Warren	72	Chris Roelfsema
(back cover) David Warren		(inset) Chris Roelfsema	42	Chris Roelfsema	73	Djoy Roelfsema
PAGES	25	Chris Roelfsema	43	(top row left to right; all) Chris Roelfsema	74-77	Chris Roelfsema
1-4	26	(top) Chris Roelfsema		(middle row left to right) Dee Passenger;	78	(left top) Landsat Satellite USGS
5		(bottom) Justin Mariner		Douglas Stetner, Chris Roelfsema		(other two) Chris Roelfsema
6	27	Chris Roelfsema		(bottom row left to right) Douglas Stetner;	79-82	Chris Roelfsema
7	28	Jennifer Loder		Chris Roelfsema	83	(left) Chris Roelfsema
8	29	(left top) Douglas Stetner	44	(left row top to bottom) Chris Roelfsema;		(middle) Chris Roelfsema
(background) Dunia Brunner		(left bottom) Chris Roelfsema		Chris Roelfsema; Douglas Stetner		(right) David Warren
(inset) Chris Roelfsema		(right, top to bottom) Dunia Brunner; Chris	44-45	(middle) Douglas Stetner	84-85	PLEA
9		Roelfsema, Jennifer Loder	45	(right row top to bottom) Jennifer Loder;	86	(top) Chris Roelfsema
(inset top to bottom) Chris Roelfsema,	30	(left top) Chris Roelfsema		Chris Roelfsema; David Warren		(bottom) Dee Passenger
PLEA, Olivier Cheneval		(left middle) Douglas Stetner	46	(left) Justin Mariner	87	(left) Jennifer Loder
10		(right top) David Warren		(right row top to bottom) David Warren;		(middle) Chris Roelfsema
Djoy Roelfsema		(bottom) Douglas Stetner		Chris Roelfsema; David Warren		(right) Michele Gallo
(bottom) Chris Roelfsema		31	47	(all except bottom left) Chris Roelfsema	88-90	(all) Chris Roelfsema
11-13		(all) Chris Roelfsema		(bottom left) Dee Passenger	91	(left and middle) Chris Roelfsema
14	31	(top) Chris Roelfsema		Chris Roelfsema		(right) Douglas Stetner
(bottom) Douglas Stetner	32	(all) Chris Roelfsema		(left two) Chris Roelfsema	92-93	Olivier Cheneval
15	33	(left row top to bottom) David Warren;	48	(right row top to bottom) Jennifer Loder;	94	(top) Djoy Roelfsema
(top) David Warren		Chris Roelfsema, Jennifer Loder	49	Alexandra Lea; Chris Roelfsema		(bottom) Chris Roelfsema
(bottom left) David Warren		(middle row; all) Chris Roelfsema		(all) Chris Roelfsema	95	Chris Roelfsema
(bottom right) Chris Roelfsema		(left top) David Warren	50-56	(top) David Warren	96	(top left to right) Chris Roelfsema
16-17		(left bottom) Chris Roelfsema	57	(bottom) Chris Roelfsema		(middle left to right) Djoy Roelfsema; Mike
(all except top left) Chris Roelfsema		34		(background) Chris Roelfsema		Pheasant; Chris Roelfsema
(top left) Alexandra Lea		(top) Chris Roelfsema	58	(inset) Dee Passenger		(bottom left to right) Djoy Roelfsema;
18		(bottom) David Warren	59	Chris Roelfsema		Chris Roelfsema
(top) David Warren		34-35	60	(top) Ruth Thurstan	97	(top left to right) Djoy Roelfsema; Dunia
(bottom left) Chris Roelfsema		(middle) Ruth Thurstan		(bottom) Chris Roelfsema		Brunner; Chris Roelfsema
18-19	35	(all) Jennifer Loder		61		(middle left to right) PLEA; Diana Kleine
(middle) Michele Gallo	36	(all except top left) Chris Roelfsema		Dee Passenger		(bottom left to right) Chris Roelfsema
19		(top left) David Warren		62-69		
Chris Roelfsema	37-38	Chris Roelfsema		(all) Chris Roelfsema		
20	39	(top) David Warren				
Chris Roelfsema		(bottom two) Chris Roelfsema				
21						
Olivier Cheneval						
22						
(top) Douglas Stetner						
(bottom left) Michele Gallo						
(bottom right) Chris Roelfsema						

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This book is the result of an amazing team effort and shared affection for a magnificent dive site by volunteers and supporters participating in the PLEA project.

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