The Brisbane Wreck to Reef ...one year on

Queensland Government
Environmental Protection Agency
Queensland Parks and Wildlife Service

The ex-HMAS *Brisbane* project has been remarkable from beginning to end - from procurement, to preparation and then the sinking.

This booklet details the transition from decommissioned warship to artificial reef. As the pictures show, ex-HMAS *Brisbane* has developed a new life. It has attracted an abundance of marine life already, in turn attracting divers from around the world.

It is well on the way to earning a reputation as a fantastic international dive destination for the Sunshine Coast and for Queensland.

Peter Beattie MP
Queensland Premier

Desley Boyle MP
Environment Minister

Disclaimer: The species list in this report is a preliminary list based on incidental sightings during the first year. Local 'common names' used in this list may differ from common names used for similar species in other coastal areas of Australia. Species lists will be reviewed and updated as new data is presented.

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Photos courtesy Blue Water Dive unless otherwise credited.



Contents

The lead up to the reef

In January 2003, the Queensland Government agreed to accept the decommissioned HMAS *Brisbane* from the Commonwealth Government for sinking off the Sunshine Coast as an artificial reef and dive site.

The ship was a 133 metre, Charles F Adams Class DDG, Guided Missile Destroyer, and in its 34 years of service, served in both the Vietnam and Gulf wars. The ship was commissioned into the Royal Australian Navy in 1967 and was decommissioned in 2001.

After extensive and careful preparation, and with the final resting place chosen the ship was towed to the Sunshine Coast for its last journey and scuttled on 31 July 2005 at a site 2.8 nautical miles east of Mudjimba Island off the Sunshine Coast.

The '*Brisbane*' is the fourth former warship to be scuttled as a dive site in Australia, following HMAS *Swan* and HMAS *Perth* in Western Australia and HMAS *Hobart* in South Australia. The ex-HMAS *Brisbane* Conservation Park has presented significant tourism, economic and industry development opportunities for the Sunshine Coast and the State of Queensland.

The '*Brisbane*' reef has been designed for divers, and is now a significant attraction for dive tourism. It complements the existing dive sites around southeast Queensland, encouraging increased dive tourism in the area. It has directly benefited the local dive industry and increased tourist numbers have contributed to the local hospitality industry and broader local economy.

The conservation park created around the wreck also allows the reef to be used for research and educational purposes.

Protecting the reef

The creation of the '*Brisbane*' Conservation Park has attracted a wealth of marine life and offers beautiful coral reef diving experiences. The 35.3 ha conservation park established around the '*Brisbane*' protects the site's increasing environmental values.

Unlike most reef systems that build up slowly over time, the HMAS *Brisbane* artificial reef commenced with a bang! On the day of the scuttling, 38 charges were detonated to sink the ship to the ocean floor in just 2 minutes and 10 seconds. After a gentle descent, the magnificent former warship settled perfectly upright in around 27 metres of water.

A range of experiences are on offer for divers to explore the infrastructure of the former warship. Marine communities in and around the wreck will invite further exploration and discovery as they continue to develop.

It has special cultural and historic significance through a rich history of service to Australia. Parts of the ship, including the bridge, missile launcher and propeller, were removed by the Navy to be used in interpretive displays at facilities including the Australian War Memorial in Canberra. The removal of other items has been minimised to ensure the ship's integrity and value as an appealing dive site is maintained.

The artificial reef is managed as a conservation park under the *Nature Conservation Act 1992*. The Queensland Parks and Wildlife Service (QPWS) is responsible for regulating access to the site and managing dive activities. General tourism operations, fishing, boating and other watercraft activities are not permitted at the site.

Selecting the site

Selecting a site for scuttling the '*Brisbane*' to create an artificial reef required a large range of physical, environmental and social factors to be considered.

Detailed surveys and analysis showed that the area chosen for the reef was a bare sandy bottom largely devoid of any marine life and showed no evidence of extreme conditions, such as strong rips or currents.

Biological surveys on neighbouring reefs and waters around the Sunshine Coast gave an assessment of local marine life. Some of the results were:

- The area supports many invertebrates such as prawns and crabs, along with a high diversity and medium abundance of fish species.
- Migrating turtles (loggerheads, green and flatback) are often sighted in the area, but there are no known rookeries on the Sunshine Coast. The deep sandy habitat is unlikely to be preferred by these turtles.
- Humpbacks are the most common species of whale in the region.
- Two species of bottlenose dolphin are regularly sighted along the coastline.

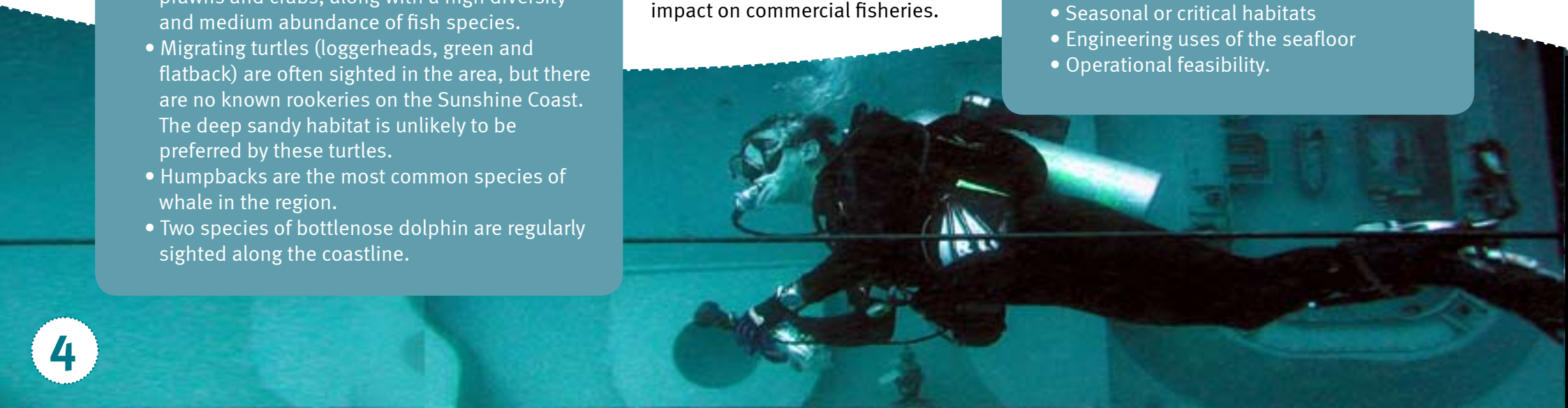
Surveys were also undertaken to identify the marine species that inhabit the local area and while ensuring the site would not threaten existing habitats it had the ability to attract marine life to colonise the artificial reef and increase local biodiversity.

Depth of the seabed and underlying rock was assessed to determine whether the scuttled vessel would be able to penetrate into the sand after it settled to the ocean floor, assisting it to remain stable and upright.

The ship's position also had to meet navigational safety requirements and have minimal impact on commercial fisheries.

Following is a complete list of criteria that were assessed in determining the HMAS *Brisbane's* final resting place:

- Navigational safety
- Physical characteristics of the seabed
- Biological characteristics of the seabed
- Oceanographic characteristics
- Coastal processes
- Vessel stability
- Diver safety and amenity
- Cultural or historical importance
- Areas of special scientific or biological importance
- Recreational and commercial fishing areas
- Spawning, nursery and recruitment areas
- Migration routes
- Seasonal or critical habitats
- Engineering uses of the seafloor
- Operational feasibility.



Ex-HMAS Brisbane Conservation Park

Artificial reef and dive site

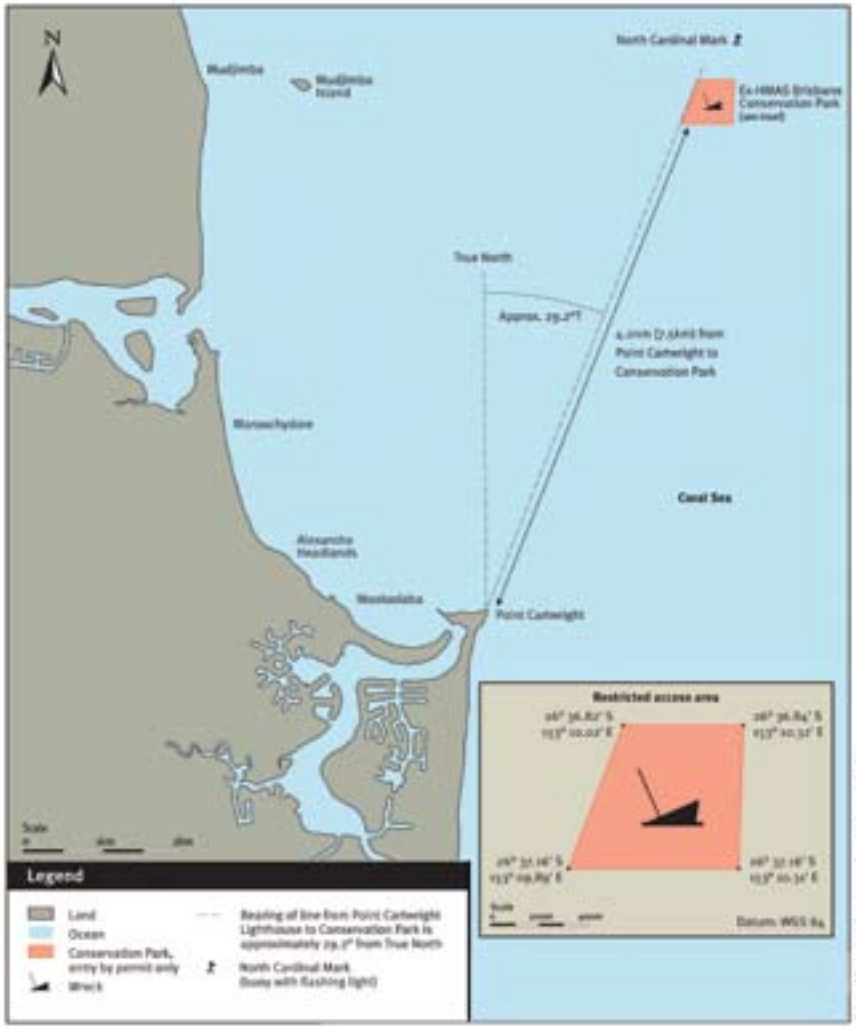


Photo: Guy Thomas

Site Feasibility

The key issues in operational feasibility of a dive site include:

- Distance from nearest port to the dive site
- Distance to mainland
- Winds and wave conditions
- Depth
- Stakeholder interests
- Operational convenience.

Diver Safety and Amenity

Key issues that were significant to diver safety and amenity in the selection of the site were:

- Currents
- Visibility
- Depth
- Waves
- Bottom surge
- Winds
- Water temperature
- Biological hazards
- Distance between harbour and dive site.

Beneath the surface

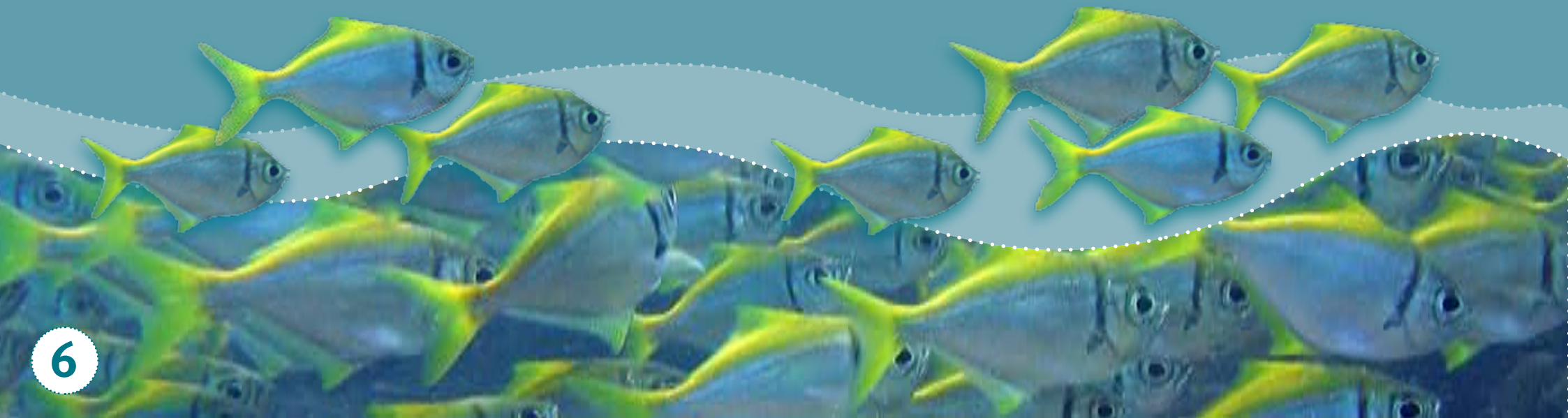
Queenslanders are custodians of some of the most remarkable and diverse marine environments on earth. Lying in a sub-tropical region, this artificial reef has developed into a thriving marine community. Divers exploring the waters around the '*Brisbane*' encounter a wonderful collection of marine life.

Creating the artificial reef has encouraged the development of new marine communities in a previously barren area and has contributed to enhancing the recreation and conservation values of the conservation park. Within days after the HMAS *Brisbane* was scuttled to serve as the nation's newest world-class dive experience, marine life had started moving in.

The wreck provides important habitats. Species use it as a place to feed, for navigation, and as an area to rest where the structure deflects or weakens currents.

The ship is now completely covered with marine algae and bottom-dwelling invertebrates, which in turn attract free-moving invertebrates and many fish species, forming a highly complex food chain. Coral growth is flourishing and visibility is generally between 12 to 15 metres, making it an underwater wonderland that will continue to get better over time.

The prolific new coral colonies will eventually cover much of the wreck, providing a vibrant habitat that will attract a rich diversity of other marine creatures for food and shelter.



Reef inhabitants already regularly seen on the wreck include many types of anemones, sponges, worms, algae, arthropods such as shrimps, crabs and lobsters, invertebrates such as hard and soft corals, sea stars, feather stars, sea urchins and colourful nudibranchs, as well as a large diversity of fish.

Sub-tropical fish are abundant. Commonly seen are schools of whiting, happy moments, varied pelagic fish, yellowtail kingfish and cuttlefish happily cruising the decks. Schools of baitfish in their thousands around the wreck have been attracting a diverse range of larger species. Many species of rays are present, including magnificent manta rays. The wreck is also a hunting ground for free-ranging pelagic species such as mackerel, tuna and jacks.

Marine reptiles have been observed; including turtles and the occasional sea snake. Resident grey carpet sharks and wobbegongs also call the wreck home.

Photo: Gary Cobb

Timeline

With the temperate climate and favourable conditions the artificial reef has had rapid colonisation of a wide array of marine life. Various species moved in as the reef developed and divers were surprised by how quickly the 'Brisbane' has been transformed into a vibrant marine ecosystem.

Photo: David Maguire

Photo: Adam Creed

August 2005

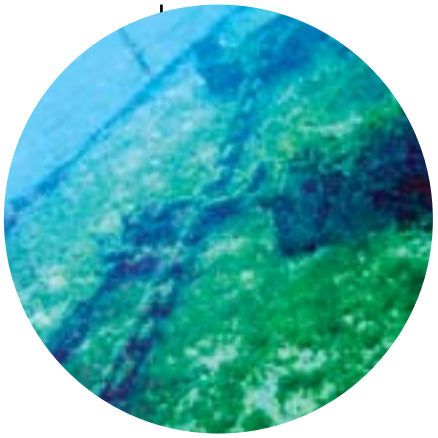
Limpets are distinctive animals which are best known for their ability to cling onto rocks. They do not have suction, but their strong muscular foot can grab small imperfections in the rock surface, and grasp very strongly.

Molluscs
Limpets and barnacles

Bony fish
Hardyhead, yakkas (*above*) and baitfish

WEEK ONE | **WEEK TWO** | **WEEK THREE** | **WEEK FOUR**

Algae
Red, brown, blue-green algae



Mammals
Dolphins

Common dolphins are highly mobile, small cetaceans distributed widely in tropical and temperate seas. The principal prey of the common dolphin are squid and small schools of fish such as sardines, pilchards and anchovies.

Arthropods
Gooseneck barnacles, crabs (*below*), shrimp

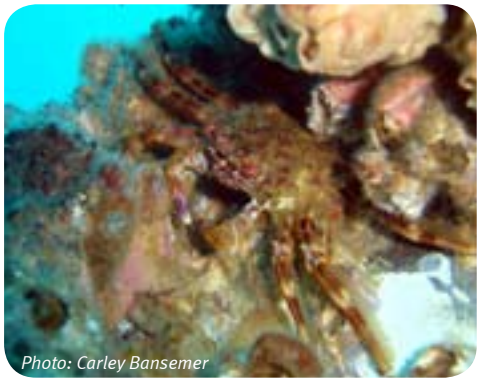


Photo: Carley Bansemer

Cephalopods
Cuttlefish and squid

Bony fish
Lionfish (*below*)

Photo: Guy Thomas

Molluscs
Nudibranch (*above*)
Razor shells

Bony fish
Yellow fin tuna
Mackerel tuna

Anthozoans
Hard and soft corals
setting on wreck

Marine reptile
Green turtle
(*above*)

Marine reptile
Sea snake (*above*)

Bony fish
Unicorn leather jacket

Bony fish
Trevally

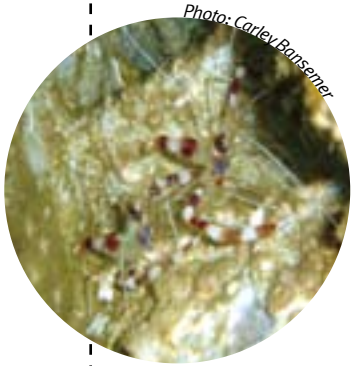
Bony fish
Red emperor
(*above*)

2006

SEPT | OCT | NOV | DEC | JAN | FEB | MAR | APR

Cartilaginous fish
Spotted wobbegong
Bull ray
Eagle ray (*below*)

Marine worms
Tube worms



Arthropods
Cleaner shrimp
Banded coral shrimp (*above*)

Echinoderms
Feather stars
Cushion stars
Sea urchins (*above*)

Molluscs
Baler shell

Bony fish
Stripey mackerel

Cartilaginous fish
White spotted guitarfish (*below*)

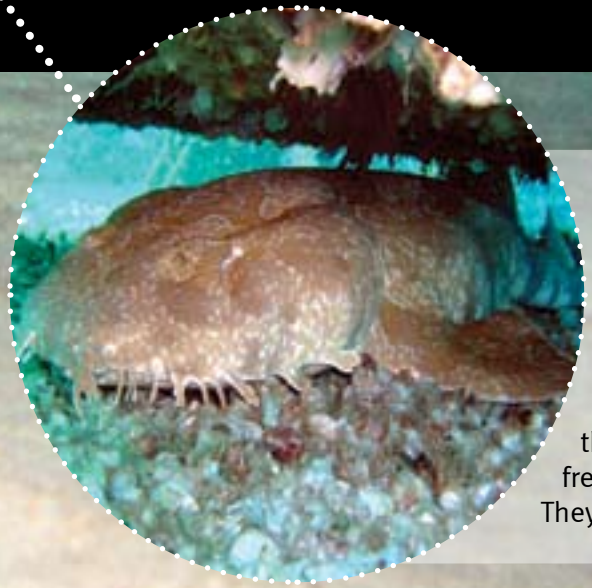
Treasure Map

The ex-HMAS Brisbane *Conservation Park offers excellent opportunities for viewing marine life. The ship is now covered with hard and soft corals, creating an underwater haven to explore. Depending on your luck, you will more than likely see some of the species highlighted.*

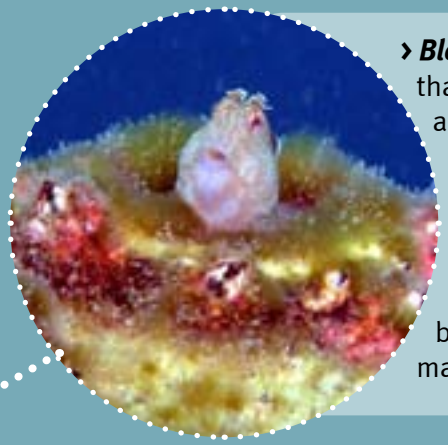
› ***Moray eels*** are solitary fish that spend most of their time inside narrow crevices or alcoves. They're carnivorous with sharp canine teeth. Their diet comprises of mostly cephalopods and crustaceans, however they do eat other fish.

‹ Many ***pelagic fish*** such as baitfish and pilchards feed on plankton and are schooling fish, forming dense shoals. There are many important food fish in this family.

‹ ***Octopuses'*** eight arms can be considered 'super lips' as they are modified appendages surrounding the mouth. Being soft bodied, they make a perfect meal for predators, particularly larger fishes and sharks. Many octopuses take advantage of their lack of skeleton by squeezing themselves through tiny holes into crevices or burrows.



‹ ***Wobbegongs*** are well-camouflaged and nocturnal feeders, preying on crabs, lobsters, octopuses and fish. They have sharp dagger-like teeth. The parent female produces eggs that hatch within the body and the young are born free swimming replicas of adults. They can have up to 37 pups.



› ***Blennies*** are small fish that have no scales. Most are blunt headed and have tentacles, cirri or a fleshy crest on the upper part of the head. Blennies tend to take refuge in small holes, backing in tail first. The majority are herbivorous.

› ***Squid*** are a diverse group of invertebrates and range in size from barely 2.5 cm to a total length approaching 18m/60 ft (giant squid). Most complete their entire life cycle — from tiny planktonic juveniles to mature adults — in approximately 1 year. Squid belong to a group of molluscs called cephalopods (Latin, "head-foot"), along with octopus, cuttlefish, and nautilus.

^ The body of a ***grey carpet shark*** is slender with broad paddle-shaped pectoral fins that are used to wedge themselves into crevices to avoid predators. They are common in shallow reef areas where they feed on invertebrates, such as crabs and shelled molluscs, as well as small fish. This shark has the ability to live for extended periods out of water. This is possibly in response to its tendency to become stranded in rock pools at low tide.

‹ ***Lionfish*** belong to the family known as scorpion fishes. They obtain their name from the venomous fin spines possessed by many belonging to this group. Many species such as the red firefish/lionfish are secretive, dwelling in caves and crevices. They remain mostly stationary during the day becoming active at night. They feed mostly on crustaceans, but can also feed on fish.

Photo: Gary Cobb

Photo: David Mullins

Photo: Gary Cobb

Photo: Gary Cobb

Attached species

{Species that stay in the one place}

GROUP	COMMON NAME	SCIENTIFIC NAME	FIRST SEEN (months)	DEPTH (m)
Bony Fishes	Chestnut blenny	*Cirripectes castaneus*	3-6	20+
	Long-finned goby	*Flavonigobius lateralis*	3-6	25+
Molluscs	Nudibranchs	*Plocamopherus imperialis*	3-6	0-20
		Aplysia sowerbyi	3-6	0-20
		Bulla angasi	3-6	0-20
		Bulla punctulata	3-6	0-20
		Bulla vernicosa	3-6	0-20
	Limpets	*Patelloida sp.*	0-3	0-10
	Razor shell	*Pinna sp.*	3-6	25+
	Baler shell	*Melo amphora*	6-9	15-25
Arthropods	Gooseneck barnacles	*Lepas testudinate*	0-3	0-20
Anthozoans (Corals & Anemones)	Hard corals	Species unidentified	6-9	20-25
	Soft corals	Species unidentified	6-9	20-25
Echinoderms (Sea stars, sea urchins, sea cucumbers, feather stars)	Feather star	Species unidentified	6-9	5-20
	Cushion star	*Culcita novaguineae*	6-9	10+
	Blue spotted sea urchin	*Astropyga radiata*	6-9	10-15
	Hairy sea urchin	*Tripneustes gratilla*	6-9	25+
Marine Worms	Tubeworms	Species unidentified	3-6	25+
	Flatworms	Species unidentified	3-6	25+
Sponges	No common name	Species unidentified	6-9	
Algae	Red, brown, blue-green	Species unidentified	0-3	0-25

The residents

{Species living permanently on the wreck}

GROUP	COMMON NAME	SCIENTIFIC NAME	FIRST SEEN (months)	DEPTH (m)
Bony Fishes	Round batfish	*Platax orbicularis*	3-6	0-5
	Greasy cod	*Epinephelus tauvina*	6-9	10+
	Red firefish	*Pterois volitans*	6-9	15
	Scorpion fish	*Scorpaenopsis sp.*	6-9	25+
	Lined fangblenny	*Meiacanthus lineatus*	3-6	10+
	Venus tusk fish	*Choerodon venustus*	6-9	10+
	Red emperor	*Lutjanus sebae*	3-6	5+
	Peacock damsel-fish	*Pomacentrus pavo*	6-9	5-15
Cartilaginous Fishes (Sharks & Rays)	Spotted wobbegong	*Orectolobus maculatus*	6-9	20+
Molluscs	Nudibranchs	*Scyllaea pelagica*	3-6	0-20
Arthropods	Painted crayfish	*Panulirus versicolor*	6-9	10+
	Blue spot crayfish	*Panulirus femoristriga*	6-9	10+
	Decorator crabs	*Camposcia sp.*	6-9	10+
	Cleaner shrimp	*Stenopus hispidus*	3-6	0-20
	Hingebeak shrimp	*Rhynchocinetes sp.*	3-6	0-20
Cephalopods	Octopus	*Octopus sp.*	6-9	5-25

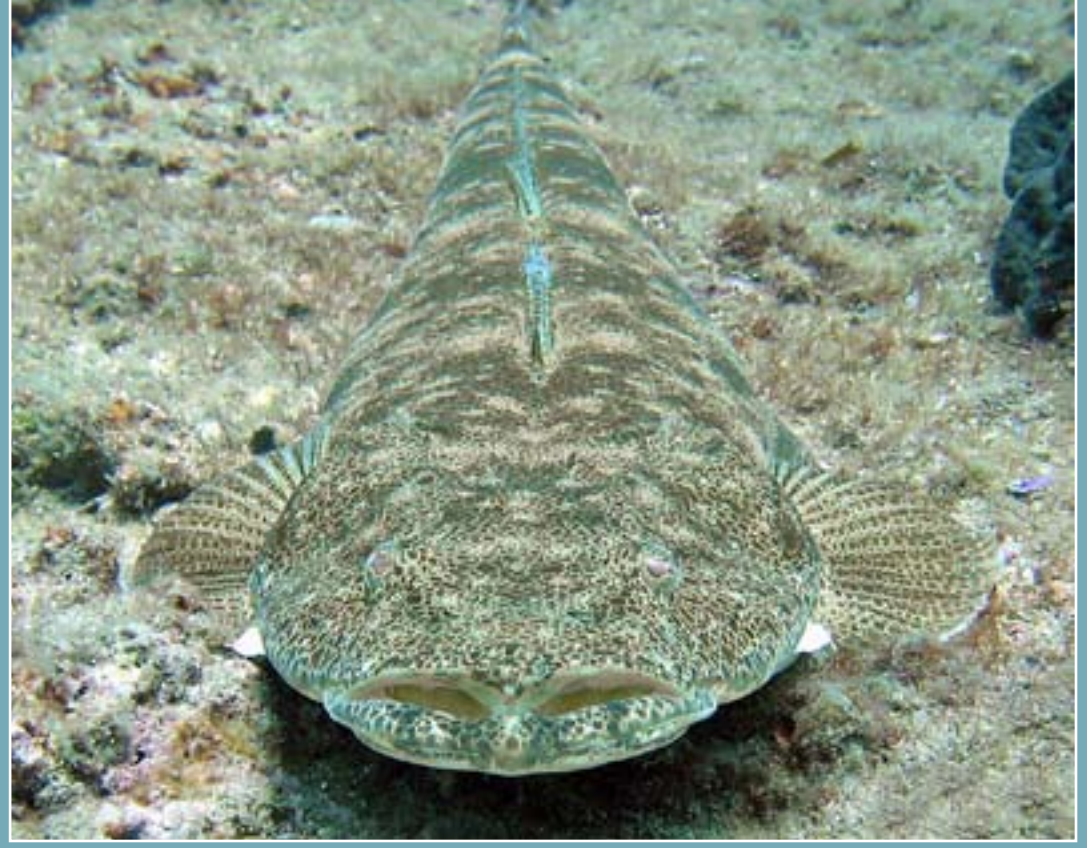
Photo: Carley Bansemer




The visitors

{Species frequently visiting the wreck}

GROUP	COMMON NAME	SCIENTIFIC NAME	FIRST SEEN (months)	DEPTH (m)
Bony Fishes	Striped angler fish	*Antennarius striatus*	6-9	5+
	Zebra lionfish	*Dendrochirus zebra*	6-9	10+
	Queensland grouper	*Epinephelus lanceolatus*	6-9	15+
	Blue grouper	*Achoerodus viridi*	6-9	15+
	Sooty cod	*Epinephelus daemeli*	6-9	10+
	Moorish idols	*Zanclus cornutus*	3-6	0-10
	Happy moments	*Siganus margaritiferus*	3-6	0-10
	Alligator garfish	*Hyporhamphus australis*	6-9	0-10
	Slimy mackerel	*Scomber australasicus*	3-6	0-10
	Trigger fish	*Rhinecanthus sp.*		10-15
	Potato cod	*Epinephelus tukula*	6-9	15+
	Three bar porcupine fish	*Dicotylichthys punctulatu*	3-6	20+
	Squirrel fish	*Sargocentron sp.*		
	Scad mackerel	*Decapterus macarellus*		
	Five-banded damsel-fish	*Abudefduf saxatilis*		
Cartilaginous Fishes (Sharks & Rays)	Bull ray	*Dasyatis brevicaudata*	6-9	20+
	Eastern shovelnose ray	*Aptychotrema rostrate*	3-6	25+



The travellers

{Species occasionally sighted at the wreck}

GROUP	COMMON NAME	SCIENTIFIC NAME	FIRST SEEN (months)	DEPTH (m)
Bony Fishes	Snapper	*Chrysophrys auratus*	6-9	5-15
	Yellowtail kingfish	*Seriola lalandi*	3-6	0-10
	Common hardyhead	*Atherinomorus ogilbyi*	0-3	0-5
	Stout long tom	*Tylosurus macleayanu*	3-6	0-5
	Summer whiting	*Sillago ciliata*	3-6	10-15
	Mackerel tuna	*Euthynnus affinis*	3-6	0-10
	Ghost pipefish	*Solenostomus paradoxus*	6-9	10-20
	Emperor sweetlip	*Lethrinus chrysostomus*	3-6	5-15
	Amberjacks	*Seriola dumerili*	3-6	5-15
	Flounder	*Pseudorhombus arsius*	3-6	20+
	Flathead	*Platycephalus arenarius*	3-6	20+
	Dolphin fish (juvenile)	*Coryphaena hippurus*	3-6	10+
	Watsons leaping bonito	*Cybiosarda elegans*	6-9	0-15
	Blue barred parrotfish	*Scarus ghobban*	6-9	5-15
	Scrawled filefish	*Alutera scripta*	6-9	10+
	Pale surgeonfish	*Acanthurus mata*	6-9	5-15
	Puffer fish	*Canthigaster sp.*	6-9	5-15
	Bluespin unicorn fish	*Naso unicornis*	6-9	5-15
	Hawk fish	*Paracirrihites sp.*	6-9	5+
	Golden trevally	*Gnathodon speciosus*	6-9	5-20
	Tea leaf trevally	*Caranx sp.*	3-6	5-20
	Large scale leather jackets	*Cantheschenia grandisquamis*	3-6	20+
	Yellowtail scad	*Trachurus novaezelandiae*	0-3	0-10
	Pilchards	*Sardinops neopilchardus*	3-6	0-10
	Banner fish	*Heniochus acuminatus*	6-9	0-10
	Black-tipped fusiliers	*Pterocaesio digramma*	3-6	0-10

The travellers cont'd

GROUP	COMMON NAME	SCIENTIFIC NAME	FIRST SEEN (months)	DEPTH (m)
Cartilaginous Fishes (Sharks & Rays)	White-spotted eagle ray Devil ray Bronze whaler shark Brown banded cat shark Southern eagle ray White spotted guitarfish	*Aetobatus narinari* *Manta sp.* *Carcharhinus brachyurus* *Chiloscyllium punctatum* *Myliobatis australis* *Rhynchobatus australiae*	3-6 6-9 6-9 6-9 6-9 6-9	10+ 5+ 10-15 20+ 20+ 20+
Sea Turtles	Green turtle	*Chelonia mydas*	3-6	0-15
Sea Snakes	Banded sea krait	*Laticauda colubrina*	6-9	0-15
Arthropods	Reef crabs Shore crabs	Species unidentified *Grapsus sp.*	3-6 3-6	5+ 5+
Cephalopods	Cuttlefish Squid	*Sepia sp.* *Sepioteuthis australis*	3-6 3-6	5-25 5-15
Marine Mammals	Common dolphin Humpback whales	*Delphinus delphis* *Megaptera novaeangliae*	0-3 3-6	0-10 0-15

Nudibranch — *Plocamopherus imperialis, Photo: Blue Water Dive*