Ningaloo Reef Adventure Camps

CORAL BAY

WESTERN AUSTRALIA

CONTENTS

1. The Ningaloo Region around Coral Bay

a. Coral Bay History

The history of Coral Bay begins at Maud's Landing. The landing of the schooner "Maud" in 1884 is the earliest recorded European activity in the region.
In 1896 the town site reserve was gazetted to protect the site of an existing jetty and government goods shed.
In 1915 the town was officially named Maud's Landing. Maud's Landing played an important role in the settlement and development in the North-West. The woolshed and jetty which included a tramway served local pastoralists in the provision of supplies and in the outward shipment of wool and sheep from 1898 to 1947. Only old pylons from the jetty remain today.
Three kilometers to the south of Maud's Landing a very beautiful bay called Bills Bay was fast becoming a popular recreational area for locals and the more adventurous fisherman.
Bills Bay was named after Ruby May French, affectionately called Aunty Billie, the wife of Charles French, the owner of Cardabia Station. The first building in Bills Bay was a holiday shack built in 1933 by Jack McKenna, manager of Mia Mia Station and used as a summer coastal retreat.
It wasn't until 1968 that formal settlement began at Bills Bay with the establishment of a hotel, caravan park and service station. The hotel was named the Coral Bay Hotel, one assumes because of the outstanding coral reef, so consequently the settlement became known as Coral Bay.

b. Maud's Landing

Maud's Landing is situated 2kms North of Coral Bay. It was named after a schooner called "Maud" whose Captain discovered the site. The site was constructed in 1896 and declared a town site reserve after construction.
The jetty or landing, was a large and comprehensive structure extending 450 metres out to sea with a 30 metre long and 6 metre wide T-Bar at the end of it. A 610mm gauge tramway, a well and a big woolshed were also built.
Maud's Landing served as a shipping point for wool, sheep and cattle up until the late 1940's, with the last shipment made in 1946. Constant repairs and lack of sufficient funding led to its closure as a coastal port in 1947.
The jetty was sold in 1950 to the Norwest Whaling Company and moved to Norwegian Bay 85km north of its original site at Maud's Landing.
Only a few weathered remains exist at Maud's Landing, a few jetty pylons protrude from the sea and a concrete footing from an old wool shed are the only reminder of what once was.

c. Norwegian bay

The Norwegian's first introduced modern whaling to Western Australia in 1911, the same year they were granted with their first whaling license. They bought with them steam driven whale chasers with powerful harpoon guns mounted on bows and well equipped factory ships.
In 1944 the station at Norwegian Bay was devastated by a cyclone. After preliminary investigations, it was resurrected in 1949. The plant was modernized so that 600 whales (allocated quota) could be processed each season, making it one of Australia's most successful shore-based stations.
To facilitate the transport of heavy machinery from centres such as Carnarvon, a roadway was laid through the sand hills in 1952. In 1955 the first distiller unit in Australia was installed and used to distil salt/seawater into fresh drinking water.
In 1956 the Norwest Whaling Company took possession of the Federal Government station at Babbage Island near Carnarvon. For a while they maintained joint operation of both stations however with increasing maintenance of dual operations, not to mention the decline in the numbers and sizes of passing whales in the area, the decision was made to cease operations at Norwegian Bay.

2. Coral Reefs

a. Organisation of Living Systems

In the natural world and in particular the marine world, life is very complex but it is also very organized. Whilst this sounds like a contradiction, actually it is not.

Atom
Simple inorganic molecule
Organic building block molecule
Macromolecule
Cellular molecule
Cell
Tissue
Organ
Organ system
Organism
Population
Community
Ecosystem
Biosphere

An organism is the complete living entity, the individual. The population is a collection of individuals of the same species, living in a particular area. A community is a group of organisms consisting of populations of different species interacting with each other in a particular area. An ecosystem is the entire biological community plus its surrounding nonliving environment. The biosphere is all of the ecosystems of the planet earth occupied by living things.
So a coral animal is an organism living in a population of the same species. That population lives in a coral reef community perhaps called a reef patch or bommie. The community is one of several in an ecosystem called reef which is a part of the marine biosphere.

b. Introduction to Coral Reefs

What is a Coral Reef?

By definition, a coral reef is a submerged hard bottom built by coral animals. That it was built by corals makes it different from rocky reefs or sand bars.

The key point here is that the fundamental building block of the ecosystem is the coral animals. This is important because average citizens around the world are judging the health of reefs they visit as tourists, based on observations unrelated to coral health such as how many colorful fish they see.

It is important to realize that many changes are occurring on the world's coral reefs and whilst the presence or abundance of some animals are important, we must not forget that the ecosystem is based on coral animals so it is corals that we need to understand and protect – all the other animals depend on them.

Where are they found?

Corals are actually found all over the sea floor but the number of species and how many of them there are is highly skewed to the very shallow areas of the tropics.

For example, there are coral types found around deep sea vents and corals found underneath the Greenland ice sheet but these are only a handful of species which do not actually build a reef and are only a small component of those ecosystems.

Tropical coral reefs are where the greatest diversity and abundance of coral animals exist. It is these tropical species and communities that construct true coral reefs.

These true reef building corals require particular factors and are therefore found only in certain places that have approximately the following conditions for long periods of time:

Temperature: 18°C to 29°C
Salinity: 32ppt to 35ppt
Clear Water
Shallow bottom
Little or no Sediment
Little or no Nutrient

These conditions mean that less than 1% of the Earth's surface is suitable for coral reef information. Yet that 1% supports approximately 25% of the ocean's fish species.

c. The Ningaloo Reef

The Ningaloo Reef is a 260 km long fringing coral reef skirting the Cape Range Peninsular. It is one of the longest fringing reefs in the world and the only fringing reef located on the Western side of a continental land mass.

Ningaloo supports an abundance of fish (500 species), corals (200 species), molluscs (600 species) and many other marine invertebrates.

Ningaloo is a special biogeographic zone where the distributions of tropical and temperate marine and terrestrial organisms overlap, and where life unique to the area has evolved. It is located further South from the Equator than a tropical reef system would normally be. This is due to the Leeuwin Current which is stream of tropical water that flows from the North down to the Southern waters of Western Australia.

The Ningaloo Reef's distance from the coastline ranges from just 200 meters offshore to up to 7 km from shore. The lagoon has an average depth of 4 meters but can be up to 15 meters in some locations.
Corals undergo a mass coral spawning event in Autumn each year, influenced by the lunar calendar. This event is believed to start a huge food chain and influence the annual aggregation of the Whaleshark.

The habitats of the Ningaloo Marine Park can be divided into these categories:

- Open Ocean – supporting both planktonic and pelagic marine life
- Seabeds of the Continental Shelf and Slope – supporting bottom fish and crustacean species, algae, sponges and soft corals
- Coral Reef – back reef lagoon, reef and reef front

d. Types of Reefs

Whilst there are many sub-types of reef recognized by specialists, we can simplify things down to about 4 major groups of reef:

- Fringing Reef: A reef that has grown along the edge of land such as an island.
- Continental Shelf or Platform Reefs: Reef that has grown with sea level rise.
- Barrier Reefs: Platform reefs that form long chains often along the edge of a continental shelf.
- Coral Atolls: An oceanic fringing reef that only occurs around volcanic islands.

e. Coral Animals

What is a Coral?

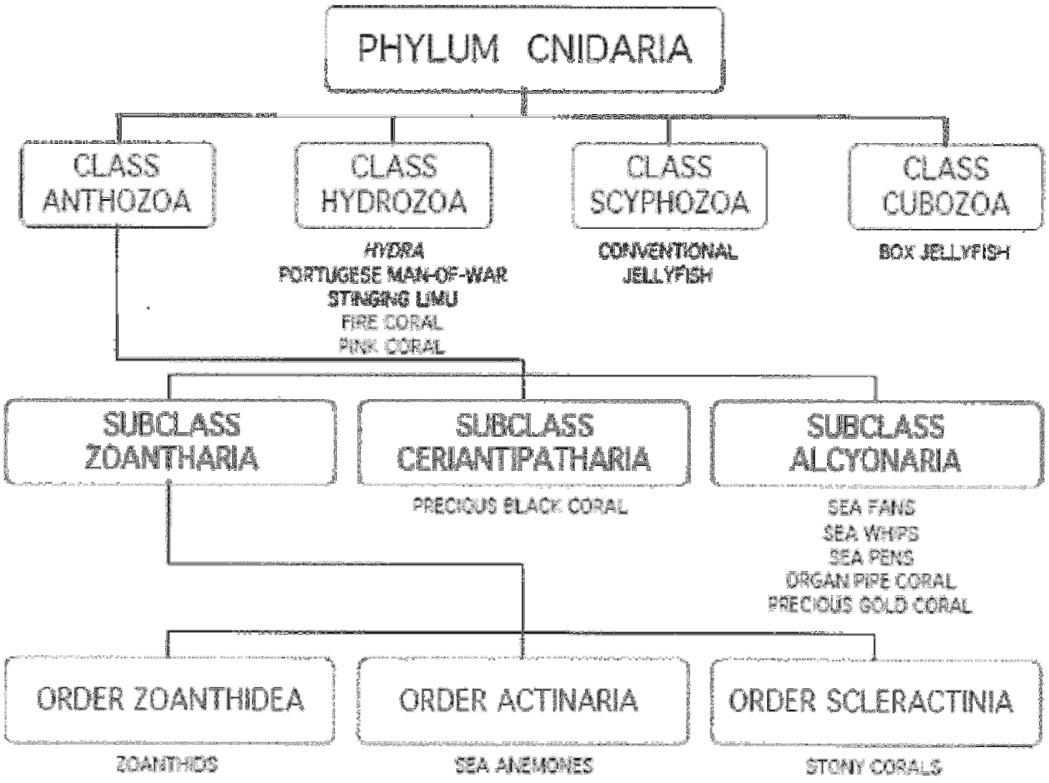
A coral is an animal belonging to the group called Cnidaria. These are an ancient group of animals that have been around for over 500 million years. They are very simple bodied animals yet recent genetic studies have shown that corals have more dormant DNA than any other living thing on Earth.

f. Coral Anatomy and Taxonomy

Corals are animals that belong to the group Cnidaria (nih-dare-e-ah) which is an ancient group of simple soft bodied animals whose body shape is dominated by a circle of stinging tentacles that surround a muscular mouth beyond which is a basic cavity forming a gut.
They are essentially upside down jellyfish with a skeleton. Corals and jellyfish are very closely related and have many similarities with respect to life cycle, growth and anatomy. However in several ways, they are the opposites of each other:

- Corals as adults are stuck to the bottom with tentacles facing up.
- Jellyfish as adults float around the ocean with tentacles facing down.
- Corals as juveniles spend just a few hours or a day swimming around the ocean.
- Jellyfish as juveniles are stuck in the sediment on the bottom.

There are more than just corals and jellyfish in the group. Some of the other members of Cnidaria you may recognize, such as Anemones.



There are two basic forms of corals – soft corals and hard corals. It is the hard corals that build the coral reefs. Soft corals are more famous because they are often photographed, due to their bright colors, so are seen in magazines or T.V. shows much more than hard corals.

The basic body plan of a coral is extended to its neighbor by a tube that joins the gut between individuals in a colony. The vast majority of corals live in colonies which can number in the millions and be as big as a house. An average coral animal however is about 5mm.

It is important to understand that each coral animal (polyp) is tiny and that most coral species form colonies of hundreds, thousand or even millions of these tiny individuals all joined to each other in that colony by their stomachs.

If one individual stings and eats something, then all individuals in that colony will share in the nutrition.

All of the individuals in one colony are genetically identical to each other because colonies begin as an individual which replicate themselves (clones) to make the colony bigger.

Coral species can only truly be told apart by the shape of their individual skeletons.

Finally, because the animals are simply bags of water held together by a few cells and they grow on top of a hard skeleton, they are highly vulnerable to impacts from objects that crush them against their own skeletons.

The direction and orientation of how the individual coral animals (polyps) grow defines the shape of the colony. It is the variation in coral colony shape between species that gives a coral reef its structure and the competition between each colony for space and light gives the reed its multi-dimension complexity.

The different shapes are strategies for coral to capture as much sunlight as possible, shade out competing colonies nearby and yet remain strong enough to support their own weight and resist breakage by wave action.

Rounded heavy colonies tend to be very strong and resist storms but also grow very slowly so risk being over grown by faster growing colonies.

Fine branched delicate colonies tend to grow very fast and not be over grown out also risk being smashed to pieces by a storm.

As a consequence, these different growth forms tend to favor areas, tough corals grown in exposed areas. However, some of the delicate corals have a strategy in which they can alter their growth to suit the conditions; they grow short and thick with strong stems in exposed reef areas.
In shallow water where the waves scatter light, the best shape for capturing as much light as possible is a branching cylinder whereas in deeper water the light travels straight down so the best shape is a flat surface or plate.

g. Coral Physiology

The single most important relationship between two coral reef organisms, is that between the coral animal and a special brown colored plant that lives with it.
Zooxanthella (zoo-zan-thel-e) is a symbiotic algae of corals. It's scientific name *is Symbiodinium microadriaticum* and they live within the endodermal cells of most hermatypic (hard or reef-building) corals. The algae is actually one phase in the life cycle of a type of unicellular brown algae called a dinoflagellate which are normally found as phytoplankton (microscopic plants that float in the water column). They capture sunlight with brown pigments instead of green.
The algae supplies approximately 95%+ of the coral nutrition through photosynthesis. It is also the algae that controls the calcification (skeleton building) of the coral reefs are dominated by the corals that have this special relationship.
It is this highly complex relationship, which also includes different types of algae and bacteria living amongst the algae, variations in response to light conditions along with temperature that is the key to understanding coral reefs.
The relationship between the algae and the coral is complex and delicate. Whilst the algae has enabled the corals to flourish in the nutrient deserts of the ocean, the algae is highly sensitive to temperature and ultraviolet radiation.
The Earth is becoming hotter due to Global Warming and UV light levels have increased due to loss of the ozone layer.
Corals have developed ultraviolet light absorbing compounds because UV light can affect biology to a depth of 30 meters which is beyond the bulk of coral depth range. However the ozone layer is thinnest near the equator and is now being removed by human activities.
So corals are always growing towards the sunlight to maximize the photosynthetic output from the algae but the closer they get to the surface, the more likely that hot water events or UV radiation can damage them. This is because temperature affects chemical reactions; heat tends to speed up reactions. Photosynthesis is a chemical reaction: as the water around coral reefs gets hotter, the photosynthesis reaction starts to over-run and this is the start of the famous "coral bleaching."

h. Coral Reproduction

Whilst coral colonies grow by replacing themselves (cloning) they reproduce sexually using sperm and eggs like most living things on planet Earth. However, since corals do not move around, they must combine sperm with egg in water. This is called spawning.
Some coral species have male and female colonies releasing sperm and egg respectively. Most corals are hermaphrodites, releasing both sperm and eggs from the same colony.
Spawning only happens once per year and is controlled by series of environmental events such as the moon, the tide and water temperature.
Importantly, it is the only way corals can re-enter and repair damaged reefs.
Once fertilized, the coral eggs become larval stages that swim around the ocean looking for a new place to start growing. If they cannot find a piece of clean coral skeleton (not covered in algae) then they can't attach themselves and start growing into a new coral.

i. Hard Corals

Hard corals are distinguishable by their hard skeleton and tentacles. The individual animals are called polyps. Most hard coral polyps have tiny single-celled algae, called zooxanthellae, inhabiting their tissues. Each polyp looks like a tiny delicate flower sitting in a cup, the open end is its mouth and the rest is its stomach. The coral animal itself is very soft, it is its secreted limestone skeleton that provides protection and support for the polyp and which forms the hard exterior. As more limestone (calcium carbonate) is deposited on the old skeleton, so the coral begins to grow in size.

Both the algae and the polyp benefit from their relationship. The polyp gets nutrients which leak out of the algae (organic carbon) and the algae have a safe place to live. Because the algae can photosynthesise (obtain energy using sunlight), coral can grow faster in light than in darkness.

Reef-building corals derive up to 98% of their nutrients from this relationship. Corals can also catch zooplankton for food using their tentacles.

It is the chlorophyll and other pigments of the algae that are responsible for the brownish colour of the tissues. Some other colours such as blue and lavender are due to pigments in the tissues.

Coral Reefs are a fragile place, which, if damaged, can take many decades to recover. It is the marine equivalent of a tropical rainforest, a home to an immense number of plant and animal species.

3. Reef Fish

Please see the accompanying booklet 'Species Identification Guide - Gascoyne Coast Region'.

4. Fish Information

a. The Role of Color and Pattern

The primary purpose of color and pattern in tropical reef fishes is identification of Species, Gender and Sexual Status. Some colours (like infrared) are not seen by humans but are seen by fish and these add to the certainty of identification.

It is thought that this strong need for certainty in identification comes about because of the need for fish to be very efficient in their activities in an environment where resources (like food and therefore energy) are hard to come by.

Example: Suppose a male Tear Drop Butterfly Fish sees a nice female Tear Drop Butterfly Fish and he initiates his full mating effort - following her around all day, displaying, chasing away other males, not eating anything, risking getting eaten by predators. Then at the end of the day, exhausted and starving, it turns out that she is actually a Saddle Back Butterfly Fish, she is actually a "he" and he is only a juvenile, not ready for reproducing.

So you can see, it is very important for fish to know exactly is who – not only the correct species out also the correct gender and the correct age. This is why there is such variation in color and pattern.

Of course, other reasons exist, for example, warnings for poisonous spines or flesh are common as well as the need to camouflage yourself for hiding and hunting.

b. The Role of Shape and Form

There is enormous variation in the shape of fishes and this relates primarily to their lifestyle – how they got their food and avoid becoming food.

The Trevely species illustrates one aspect of body shape – swimming style. This is a fast moving predator that uses extreme streamlining to reduce drag and at the same time have a big tail for maximum acceleration. Its pectoral fins and dorsal fin have cavities built into the fishes body that they fold into.

The opposite to this would be a round blubbery slow moving fish with big pectoral fins – a puffer fish. Such a fish doesn't need to chase its prey (snails) and because all puffer fish are poisonous, it doesn't have to avoid being eaten either.

There are of course many other shapes we can talk about and see on the reef. Each shape will have a particular purpose and it's a good idea to think about these shapes as you are snorkelling because you will begin to see and understand the lives of fish.

c. An important note about Algae Grazers

The world's coral reefs are dying. Yet most people who visit dead or dying reefs seem not to notice. How is this possible? It is because of colorful fish.

When you are snorkelling around today, what are you looking at mostly, what are you noticing the most? Chances are you're looking at the fish.

Around the world, where coral reefs have died, most people don't notice because most people are looking at the fish. When corals die, algae takes their place and as you have just learned, there are several big fish families of fish which eat algae.

So on the coral reef that has died, there will be almost no coral but because there are still lots of colourful fish eating the algae, people don't notice that its not a coral reef anymore – its an algae reef. With only a few species of fish and none of the thousands of other types of living things that used to be there.

d. Another Ocean Habitat- Seagrass

Seagrass differs from seaweed. Seaweeds are simple plants that have no roots or flowers and need a firm surface, like rock to grow on. Seagrass, in contrast, are green, flowering plants with a complex root system and an unusual reproductive process. Unlike seagrasses, few species of flowering plants can survive in a salty, underwater environment.
Seagrasses provide a platform on which small seaweeds and animals can attach and grow as epiphytes. These seaweeds and animals are an important part of the food chain, being grazed on by fish and smaller crustaceans. Dugongs and turtles also feed on these seagrasses. Other animals that are important in the food chain, such as the filter feeding oysters and scallops, feed on the bacteria and fungi of decomposed seagrasses that are high energy food rich nutrients. The seagrass meadows also make hiding places for small fish and prawns, as well as being a nursery for these animals.
The clear waters of the Ningaloo Reef allow sunlight to penetrate underwater and photosynthesis, essential for the growth of plants, to occur. Offshore limestone reefs shelter the seagrass meadows from the storm driven swells that might otherwise tear them from the sandy bottom. While being protected, the tidal movement within the lagoon circulates oxygen, which is vital to the growth of seagrasses and the male seagrass pollen.
Apart from its importance in the food chain, seagrass plays an important role in the well being of Ningaloo's marine environment. Seagrass meadows can slow water movement like stopping a one knot current and smoothing a one metre wave. This is important for organisms living in shallow tidal areas, the nursery grounds commercially important for fish like mullet and tailor, that otherwise might be buffeted by waves. Seagrass meadows also prevent sand erosion and trap sand to form banks suitable for seagrass to grow, and also organisms such as burrowing bivalve mussels to grow. If damaged or removed, seagrass takes many years to recover.

5. Animals of the reef

a. Whales

Whales are an aquatic animal that are found in all oceans around the world.
They can reach up to an average of 15 metres in length. Like other mammals, whales breathe air, are warm blooded and produce milk to feed their young. Their adaptations for aquatic life include a streamlined form, nearly hairless skin and an insulating layer of blubber, which can be as thick as 70cm in some arctic species. Whales have one or two nostril openings, called blowholes, located far back on the top of the head. The nostril valves close and the lungs compress when the whale dives. Most whales must surface every 3 to 20 minutes to breathe, but some like the sperm whale, can remain submerged for more than an hour. Spouting occurs when the whale surfaces and clears the water from its blowhole along with any moisture trapped in its air passages. Whales have small eyes, designed to withstand great pressures and most species have good vision along with excellent hearing. They have brains larger than those of humans and are believed to be extremely intelligent. Most large whales travel in small pods but some will swim alone or in pairs. Smaller whales form pods of up to several thousand individuals. Most large whales are found in the open ocean, where they migrate thousands of miles between feeding and breeding grounds. Females of most species give birth to a single calf every two to three years. Gestation periods range from 9.5 up to 17 months. The newborn calf is pushed to the surface by the mother or by another adult, it is able to swim almost immediately and is nursed from 6 to 12 months. In Western Australia there are several whale species that migrate along the coast, including the Blue Whale which is the largest living animal on earth. More commonly seen is the Humpback Whale as they swim closer to the coast. Between July and October is the best time of year to see Humpback Whales along the Ningaloo Reef. The whales leave Antarctica in autumn and travel along the coast to calve in Northern waters and then returning again in spring.

b. Humpback Whales

(Megaptera Novaeangliae)

Humpbacks are the fifth largest of the great whales and are noted for their haunting songs. Named because of the distinct “hump” that shows as the whale arches its back when it dives, humpbacks are more coastal than most of the other large baleen whales. When in a playful mood, they may put on more spectacular displays such as breaching, rolling, slapping their pectoral fins and generally having a “whale” of a time.

Description: Humpbacks have knobby heads, very long flippers with knobs on the front edge, and a humped dorsal fin. They are blackish, with white undersides and sides. Males average 14.6 metres and females 15.2 metres long. The maximum length is 18 metres and a mature adult may weigh up to 45 tonnes.

Status and Distribution: Humpbacks are widely distributed throughout all the world’s oceans. They weigh heavily exploited by whalers and their numbers severely depleted. The population has been recovering at a remarkable 10 per cent each year since they became protected in 1963. Nevertheless, there are estimated to be only a few thousand humpback whales in southern oceans and in Western Australia they are considered endangered.

Migration: Each autumn, in late April early May, the Australian humpbacks leave Antarctica to migrate northwards to their tropical calving grounds along the west and east coasts of Australia. About August, they begin traveling south to their feeding grounds in the Antarctic. The first whales seen to be heading south are usually the newly pregnant females, followed by immature whales of both sexes, then the mature males and females. Mothers with newborn calves stay longest, and travel more slowly, enabling the calves to grow rapidly and develop a thicker layer of blubber for protection in the cold feeding waters they will soon be visiting for the first time.

Feeding: Australia’s humpbacks spend the summer in the waters of Antarctica feeding mainly on krill. They are filter feeders, straining their food from the water by means of hundreds of horny baleen plates hanging from their upper jaws. These have bristly edges which mesh to form a filter. Humpbacks can consume nearly one tonne of food each day. They feed where large concentrations of prey are available.

Breeding: When they are born, after about a 12 month gestation period, calves are about four and a half metres long and weigh about one and a half tones. The mother’s milk has a 35 per cent fat content and milk production can be as high as 600 litres per day. The sucking calf can gain more than 45 kilograms a day during the first few weeks of life. Nursing ends about 11 months when the calf can be up to nine metres long.

Stranding History: Humpbacks rarely strand. There is little rescuers can do to help humpbacks, as these huge animals are impossible to move.

c. Indo-Pacific Humpback Dolphin

(Sousa Chinesis)

The most obvious feature of these dolphins is their crookedly humped dorsal fin, which is wide at the base, then flattens out before rising to a triangular, pointed tip. Indo-Pacific humpbacked dolphins hug the shorelines in the primarily tropical waters where they are found. They are rarely seen beyond the surf zone, favouring shallow waters no deeper than 20 metres. They also live in mangrove channels, bays and estuaries.

Description: The maximum length is less than three metres. The colour of these animals varies with age and area, but those in Australia darken to a lead grey colour as they age. The undersides are, however, off-white and the dorsal fin may be white in older animals. The tail is relatively large and the beak is long and slender.

Status and Distribution: Though largely tropical, the Indo-Pacific humpbacked dolphin is found in some subtropical areas in association with warm currents. Because of its coastal habits, this dolphin species may be caught accidentally in fishing nets and drowned. Its habitat is also being destroyed or degraded in some areas, for example, reclamation of mangroves. However, the species is not considered threatened.

Life History: Humpbacked dolphins may form loose associations of two or more, but it seems they will readily leave these groups to associate with different animals. These small groups sometimes combine to form larger schools. Humpbacked dolphins feed on a range of schooling fish. They are slow swimmers but may be seen leaping, chasing or back somersaulting. They rarely bow ride and generally avoid boats.

Where to see them: They are frequently seen in the Ningaloo Marine Park.

d. Bottlenose Dolphin

(Tursiops Truncatus)

The famous dolphins of Monkey Mia are bottlenose dolphins. Bottlenose dolphins are often seen riding on bow waves created by boats, surfing waves or leaping playfully into the air.

Description: Bottlenose dolphins have prominent dorsal fins, which are seen slicing through the water. The fin is slightly hooked and set midway along the body. This frequently photographed mammal is also recognized by its well formed melon and short, wide and rounded beak. The species has a medium grey back above a pale or light grey flank or belly. The flippers are broad at the base and taper to a point. Bottlenose dolphins are very variable in size, ranging from between two to four metres as adults, depending on where they are found. Average length is three metres and calves are about a metre at birth.

Status and Distribution: This species is common in cold, temperate and tropical seas and estuaries all over the world. It is often seen inshore in estuaries, even entering rivers, and an offshore form is found in the open ocean. In some parts of the world bottlenose dolphins are killed for food.

Life History: Bottlenose dolphins have a fascinating social structure. Within a population, they form small subgroups which inhabit a defined home range. Members of a group, however, change from time to time and they assist each other in activities such as fish herding and calf rearing. Even mating is a group activity – the males co-operate to herd a female in reproductive condition and take turns to mate with her. They also try to prevent rival groups from having access to her. A calf is generally born 12 months later. The species live for 25 to 30 years and females begin to breed from about 6 years of age, calving every two or three years. The calves suckle for up to 18 months. Bottlenose dolphins eat a wide variety of fish, squid and octopuses.

e. Common Dolphin

(Delphinus Delphis)
These boisterous mammals seem to enjoy bow riding, breaching and somersaulting clean through the air.

Description: Common dolphins have an hourglass pattern of light grey and tan or yellow on their sides and a dark stripe from flipper to lower jaw, with a long well-defined black beak. Calves display the same patterns but are lighter in colour. They have a prominent triangular dorsal fin, pointed flippers and a slender, streamlined body. Average length varies according to the location, but is approximately two metres.

Status and Distribution: These predominantly offshore inhabitants are one of the world's most abundant dolphin species. They are widely distributed throughout tropical, subtropical and temperate areas. They are, however, fished in Japan, South America and elsewhere, depleting some local populations.

Life History: Common dolphins are highly vocal and produce a range of clicks and whistles used for both communication and navigation. They live in large herds, ranging from dozens to more than 1000, which may be segregated according to sex and life cycle. They often combine to catch a variety of prey, favouring squid and smaller schooling fish. Movements are probably related to seasons and offshore banks where upwelling provides better feeding opportunities.

Stranding History: Where they strand, common dolphins are usually alone. Strandings in southern California are believed to be caused by parasitic worms damaging brains and ear cavities.

f. Whale Sharks

(Rhincodon Typus)

The annual migration of the whale shark at Ningaloo Reef has become an internationally known tourist attraction.

Occurrences of whale sharks are patchy and unpredictable. Ningaloo Marine Park is one of only a few places where they appear regularly in near shore waters where they are easily observed.

Whale sharks occur in all tropical and warm temperate seas. They are found in coastal and oceanic waters around the equator between 30 degrees north and 35 degrees south. It appears that the range of whale sharks encompasses areas with surface water temperatures between 21 and 25 degrees Celsius, where cool nutrient rich upwelling mingles with warm surface waters. At Ningaloo, whale sharks begin to appear at the time of the coral spawning after the full moons in March and April. This event together with the nutrient rich upwellings result in plankton blooms which the whale sharks gather to feed on.

Whale sharks have approximately 3000 tiny teeth but they are not used during feeding. Instead, the whale shark can sieve prey items as small as 1mm through the fine mesh of the gill-rakers. They are able to open their mouth to a great width (greater than 1m) to optimize feeding.

Most whale sharks encountered at Ningaloo are males and the average length is about 6 metres.

Scientific research on whale sharks continues at Ningaloo Reef. Scientists are trying to determine populations, foraging and migratory behaviour. Natural patterning on the skin and information on scars, sex and size help identify individual sharks. It is hoped photo-identification libraries will make it possible to identify whale sharks returning to the Ningaloo Reef.

g. Dugongs

The dugong is the only strictly herbivorous marine mammal. The dugong is one of only four members of the mammalian order “Sirenia”, also called sea cows.
Dugongs are similar in size and shape to a very fat dolphin, but are more closely related to the elephant, having evolved on land before moving into the oceans to feed on seagrasses. It is thought that because they found abundant suitable food in inshore waters or because they found it easier to avoid predators, the ancestors of the dugong left the land forever. Over time their grey-bronze bodies assumed a dolphin-like, but less streamlined shape. A heavy and blunt end with the mouth opening downwards for convenient grazing, and nostrils located on top of the head that close like a valve like mechanism to enable the animal to breath while most of its body is underwater. Usually they spend only seconds on the surface between dives.
Although considered slow swimmers, dugongs can reach 20km/hr over short distances and can cover long distances at slow speeds.
While dugongs live for more than 70 years and grow to about 3.3 metres and weigh up to 400 kilograms. An average size adult measures about 2.7 metres and weighs between 250 and 300 kilograms.
Females don’t calf until they are at least 10 years old and then they bare a single calf after a gestation of 13 months, every three to seven years. Calves are born a little over a metre long and weigh about 30 kilograms. They are suckled by their mother for up to 18 months although they start eating seagrass soon after birth. Mothers are attentive, and care for their young for up two years. They communicate with bird-like chirps and high pitched squeaks and squeals. Calves never venture far from their mothers and frequently ride on her back, particularly when danger threatens.
Dugongs are closely linked to the mermaid myth, the group’s scientific name, Sirenia, being Latin for siren. Legend has it that the Dugong was an enchantress, a sea siren or mermaid that lured sailors and their ships into dangerous waters with their songs. Being warm blooded, fleshy and quipped with the archetypal mermaid tail, seen from a distance the Dugong is said to have set a many a love-starved sailor’s heart pounding.

h. Manta Rays

Coral Bay is one the few places in the world where you can snorkel with Manta Rays in shallow waters. Although there is still little known about these magnificent animals, the biggest threat to them is considered to be in the form of activities or processes that impact on the water quality and disturb their habitat.

Manta Rays are filter feeders. They are known to feed on planktonic crustaceans, such as copepods and crab zoea, but also opportunistically on various larvae. When feeding their cephalic lobes become unfurled and spread, directing and sometimes scooping planktonic bearing water into their mouth. Manta Rays can often be seen feeding by swimming in slow vertical loops that are repeated over and over, also known as "barrel rolling".

Manta Rays are known to have 300 rows of tiny peg like teeth. The crown of each tooth has a blunt surface with three weak ridges. They are not used for feeding but are believed to play a role in Manta courtship and mating.

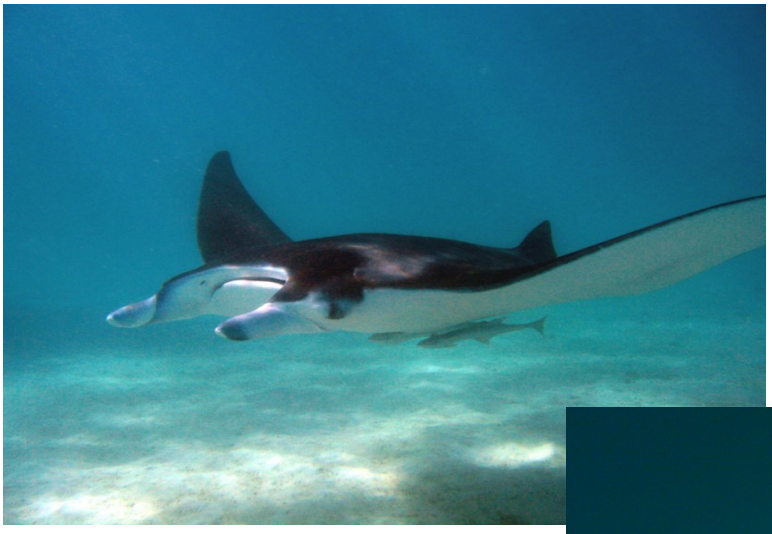
The average size of the Manta Rays we encounter within the waters around Coral Bay, average from approx 2 metres from wingtip to wingtip, up to approx 4 metres from wingtip to wingtip.

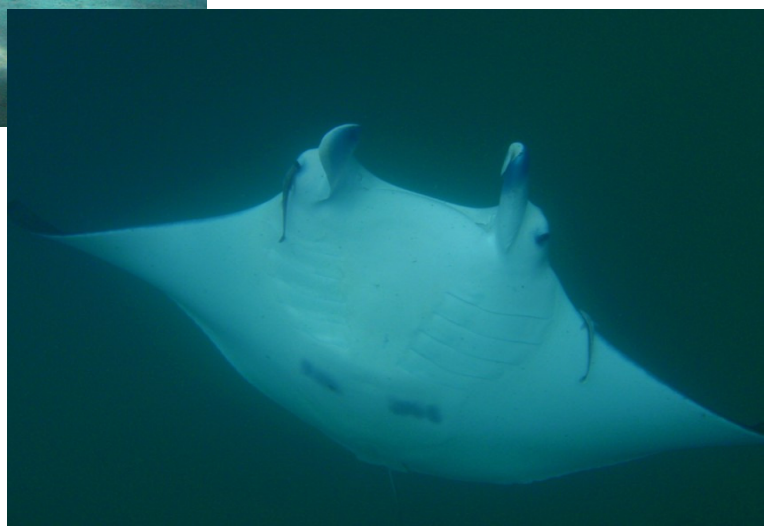
The average speed of a Manta Ray is around 15 mph (24km per hour).

Manta Rays are viviparous. They produce live young hatched from an egg. Pups are wrapped in a thin embryonic skin filled with nutritious uterine milk, which they feed on until they are fully developed and ready to be born.

Gestation takes between 12 to 14 months, with the later stages of pregnancy highly visible as the female's abdomen swells to accommodate the growing pup.

The size of a newborn Manta Ray ranges from 0.9 metres to 1.2 metres from wingtip to wingtip. Nothing is yet known about where Manta Rays give birth.





i. Sea Turtles

Marine Turtles are ancient mariners who have survived in the world's oceans for over 100 million years. They are well adapted reptiles which have a strong, protective shell known as a carapace and four paddle-like flippers that are used for swimming and crawling up the beach to lay eggs. Marine Turtles breathe air, have a strong sense of smell and well developed eyes, allowing them to see different colours.

Marine Turtles are long lived animals and reach maturity between 30 to 50 years of age. Throughout their lives they occupy different habitats, from the open ocean to coral reefs.

There are seven species of Turtles in the world, six species are found in Australia and four species are found on the Ningaloo Reef – Loggerhead Turtle, Green Turtle, Hawkesbill Turtle and the Flatback Turtle.
The high density of Turtles at Ningaloo Marine Park exceeds the numbers ever recorded in the Great Barrier Reef Marine Park, which has been attributed to the particularly clear waters of the area.