



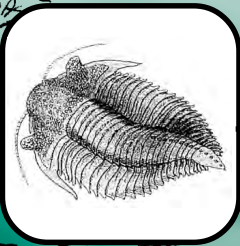
Junior Ranger

Review

Issue 1, 2001

Seaweed

A Special Edition

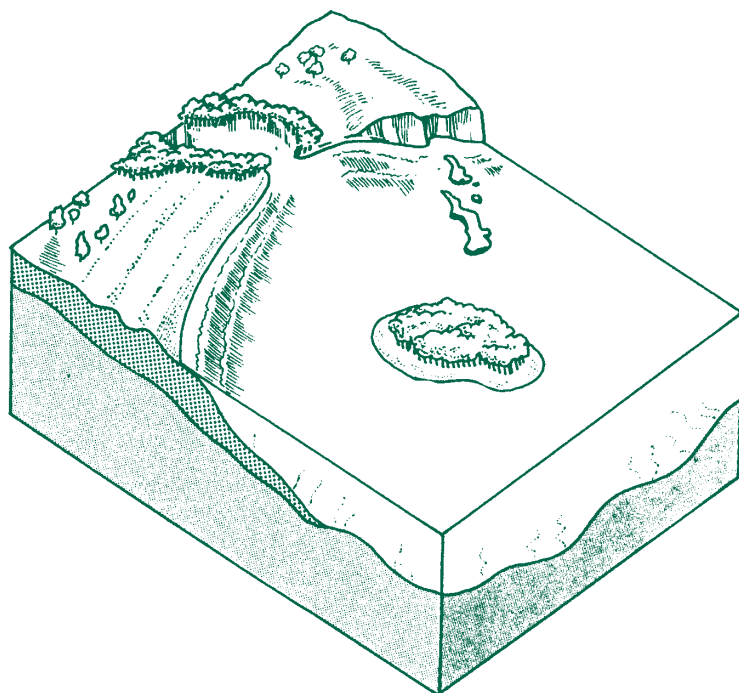


Creature Feature
Fossilised Creatures



On the Brink
The Dugong

11th - 18th March



Australia is the world's biggest island. The coastline is of great importance to us.

Australia has 36,735 km of coastline to look after. When our many islands are included, the coastal zone is over 50,000 km.

Most Australians live near the coast. 5 million live within 3 kilometres. Even those who don't live by the sea often head there for their holidays.

Lots of our garbage, chemicals and sewage ends up in the sea. The oceans are huge and for a long time people thought it didn't matter what we dumped into them.

But as the world's population races past the 6 billion mark, our seas are under threat as never before. The impacts of pollution, global warming, collapsing fisheries and the spread of pests must be faced.

A large variety of soft and hard corals grow on the shallow off-shore reefs and islands, away from the muddy waters of the river mouths which block out the sunlight that the coral needs.

Join the crew! Because we're all in the same boat.

Seaweek is an annual event organised by the Marine Education Society of Australasia: MESA.

MESA members include surf riders, fishermen,

young people, teachers, marine scientists and rangers. Seaweek is MESA's major national public awareness campaign. It was started in 1987 by Julie Swartz and Pauline Halpin at the Marine Discovery Centre in Queenscliff, Victoria.

The aim is to focus community awareness, provide information and encourage an awareness of the sea.

To find out more, you can visit the MESA website at <http://www.mesa.edu.au>



The Territory is diving into Seaweek with a big splash.

Roana O'Neill is the NT representative for MESA.

You can talk to her by ringing the Community

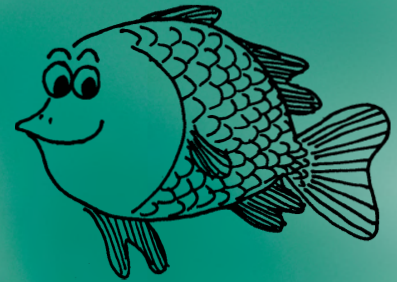
Education team in Darwin on 8999 4565. Her email is roana.oneill@nt.gov.au

Some great activities are planned and shed love to hear from you. There's also events happening in other parts of the Territory too.

In Katherine you can talk to Andrew Pickering on 8973 8865.

Alice Springs Junior Rangers can ring Kym Schwartzkopff on 8951 8242.

“If the world’s natural environments were people, then half the world’s shorelines would be in hospital.”



Managing and Conserving the Marine Environment

Surveys show there is widespread awareness in Australia of environmental issues. The big challenge now is to convert this into effective action and good management of the ocean's resources.

Conservation of the marine environment is not easy.

- The oceans are huge and they are fenceless environments.
- There are countless users of the oceans and so many vested interests.
- There is so much we have to learn about how the oceans work.
- Sometimes it is hard to see the damage we are doing.

Effective management requires:

- clear goals;
- a sound understanding of the environment;
- the ability to take action.

The Parks and Wildlife Commission of the Northern Territory has responsibility for managing a number of marine parks and coastal areas. Marine scientists are employed to do this work on behalf of the people of the Northern Territory.

What qualifications do you need to be a marine scientist? The minimum is a university degree in natural resource management, marine biology or marine ecology. However, the job involves regular work in isolated areas and so you may also need:

- a coxswain's certificate;
- a first aid certificate;
- training in search and rescue techniques.

What does the job involve?

- Doing research work so we can understand the environment better;
- Designing work programs to protect

marine life and prevent damage to the environment;

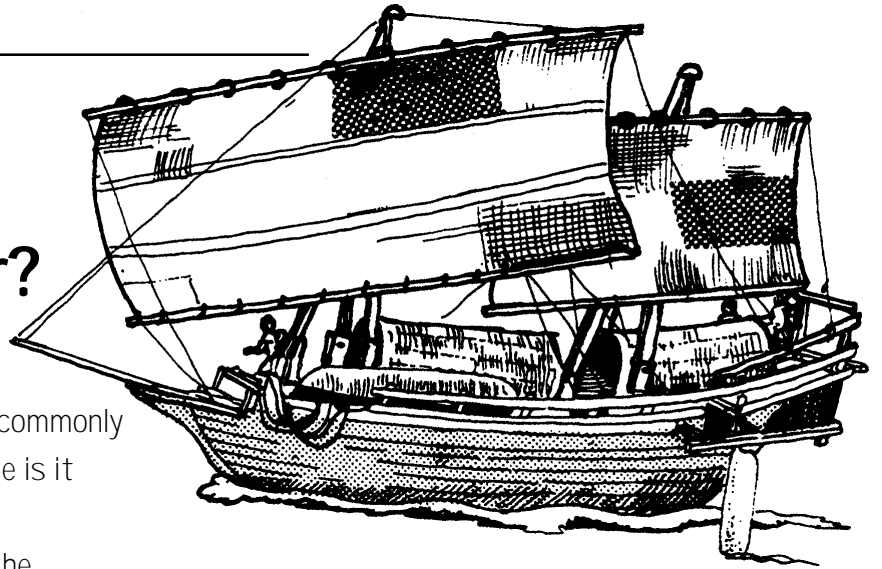
- Obtaining and managing the money needed to protect the environment;
- Talking with the people who use the area for work or recreation;
- Recording how Aboriginal people use and manage the environment both past and present;
- Educating the local community about environmental issues;
- Training other people to look after the environment;
- Making sure people obey the laws the Government has made to protect the marine environment.

Want more information? Ring the Community Education team in Darwin on 8999 4565. They have organised a special video for Seaweed in which a Conservation Management Officer is interviewed about the work they do.

Nature Quiz

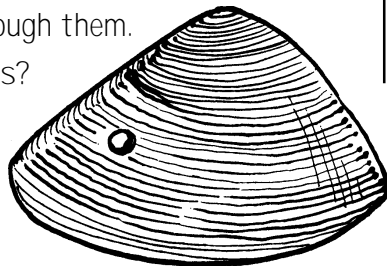
How many of these questions about the sea can you answer?

(You'll find the answers on page 11.)



1. The Portuguese Man-O-War is a creature commonly seen on Australian beaches. By what name is it better known?
2. True or False: Penguins are only found in the Southern Hemisphere.
3. Insects have 6 legs. Spiders have 8. What about prawns?
4. Frenchman Jacques Cousteau is renowned as an underwater explorer. But he first made his name because of something he invented. What was it?
5. You frequently find shells on Top End beaches with holes neatly drilled through them. What makes these holes?

drill hole



6. For 250 years until 1907, Macassan sailors visited the Top End in their praus each wet season. Why?
7. Of the world's 4 major oceans (Atlantic, Pacific, Indian and Arctic), which is the biggest? Which is the second biggest?
8. Soldier crabs can do something that no other crab can do. What is that?
9. What is the largest invertebrate in the sea?
10. The wreck of the Titanic lies at the bottom of the Atlantic, nearly 4 kilometres down. However, the deepest point on the ocean floor is in the Pacific. How deep is it?

What's my name?

I am a large seabird with pointed wings and tail.

I live in the tropics but I am a close relative of the gannets of southern Australia.

I enter bays and harbours in search of fish, but I am a strong flier and may travel hundreds of kilometres out to sea in search of food. To catch the fish, I plunge into the water with my big wings folded back like an arrowhead.

I like company at breeding time. Colonies of us breed on islands off the coast of northern Australia and the Great Barrier Reef.



To reveal my name, replace each letter with the one that comes after it in the alphabet.

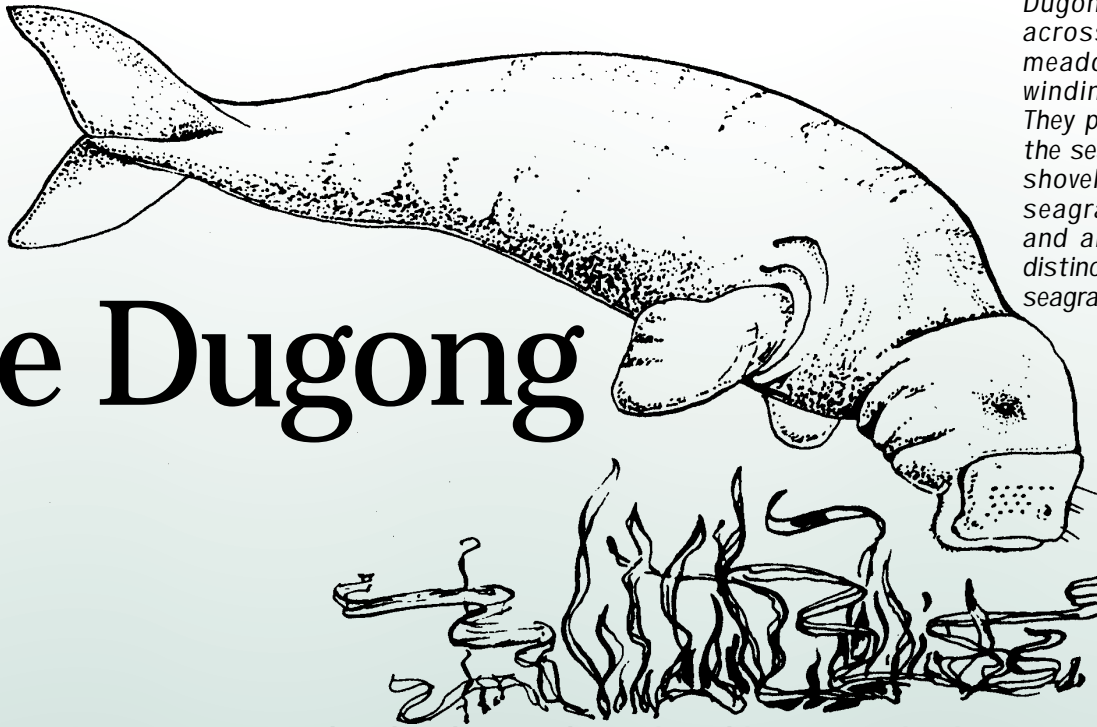
A Q N V M

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A N N A X

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On the Brink



Dugongs cruise across seagrass meadows in a winding pattern. They plow through the seagrass beds shovelling up the seagrass, roots and all, leaving a distinct trail in the seagrass beds.

The Dugong

Dugongs are not yet considered endangered or vulnerable in Australia, however, they are listed as vulnerable to extinct in the International Union for the Conservation of Nature (IUCN) Red Data Book of Threatened Species.

Adult dugongs have few natural enemies, apart from humans.

The dugong has an important cultural and food role for Aboriginal people, and are still hunted by coastal Aboriginal people in northern Australia today.

Thousands of dugongs were slaughtered in Queensland around 100 years ago to extract oil from their carcasses.

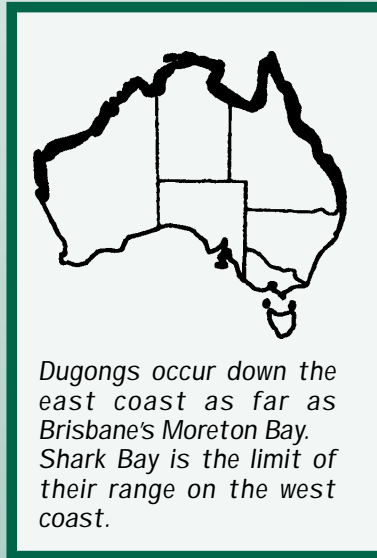
Shark nets set to protect swimmers on Queensland beaches killed many dugong in the early days of netting. They still kill a number of dugong each year.

A small number of dugong are also killed by powerboats, however, this is limited to a few specific locations.

The biggest threat to their survival today is the damage we are doing to their natural habitats.

Land clearing, farming, urban run-off and waste discharge have caused siltation or pollution of seagrass beds, destroying them or stunting their growth.

Since the 1970's, Australian researchers have been monitoring dugong numbers using aerial surveys. This technique gives reasonably good counts, although it



Dugongs occur down the east coast as far as Brisbane's Moreton Bay. Shark Bay is the limit of their range on the west coast.

doesn't take into account animals hidden by murky water.

Recent advances in technology have made satellite tracking possible. Researchers in small boats chase the dugong until they are able to slip a net over its head. The dugong is then held on an inflatable raft while a belt with a transmitter is attached to its tail and the dugong is then quickly released.

Tracking data indicates that most dugongs do not travel much and remain in the vicinity of inshore seagrass beds.

Some do undertake long journeys of up to hundreds of kilometres.

Survey data collected to date suggests that dugong numbers are reasonably stable in northern Australia and in the northern sections of the Great Barrier Reef.

However, between 1986 and 1994 numbers in the southern section of the reef and southeast Queensland declined by half.

Brisbane's Moreton Bay remains a significant place for dugongs but deaths now outnumber births there.

Dugong Fact File

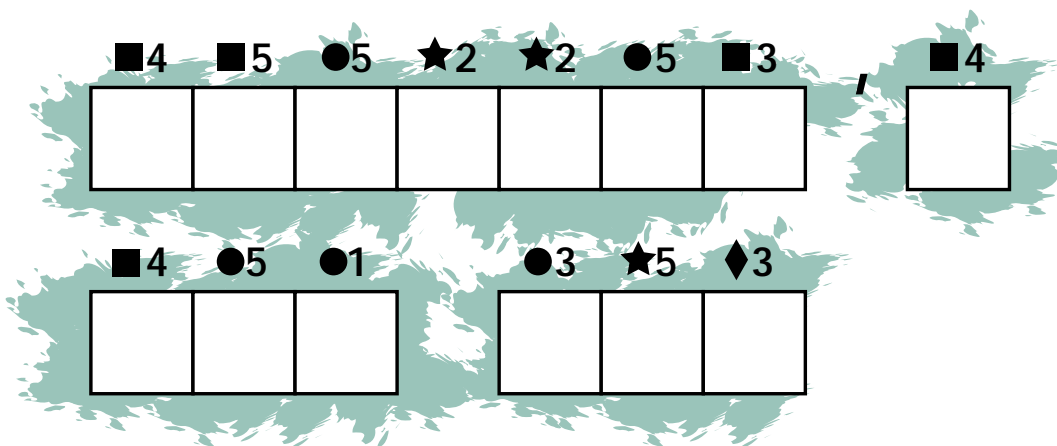
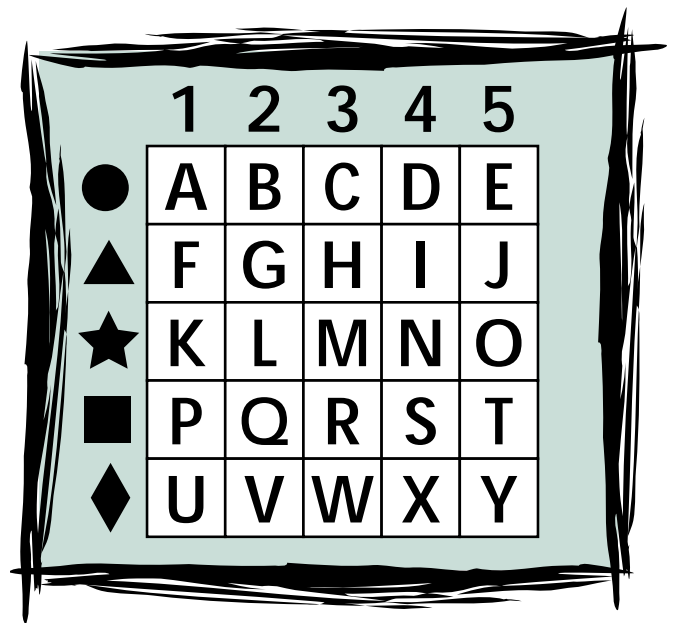
The Dugong and its close relative the Manatee, from the northern hemisphere, are the only herbivorous mammals that are completely aquatic. Descended from land mammals that browsed in shallow grassy swamps many millions of years ago, their closest modern relative is the elephant. Dugongs are exclusively marine, feeding on seagrasses in shallow coastal waters. Dugongs live for a long time, as much as seventy

years and reproduce only slowly. A female dugong has only a few calves during the course of her life. They can swim at speeds of 20 kilometres an hour, propelled by up and down beats of their horizontal tail. Nostrils on top of the snout enable them to obtain air by raising their head for just a second or two. Manatees live in rivers, estuaries and coastal waters of tropical west Africa and the West Indies. They are now rare.

Use this grid to decode its name.

Another relative of the Dugong became extinct in 1768 after being ruthlessly hunted by sealers for meat.

Unlike Dugongs and Manatees, it was a cold water creature, living in the northern Atlantic. It was longer than a Dugong, growing to 7 metres.

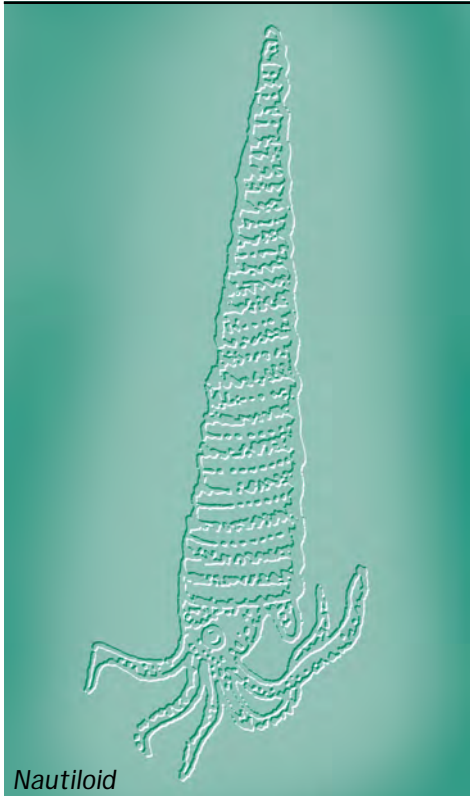


Mermaids

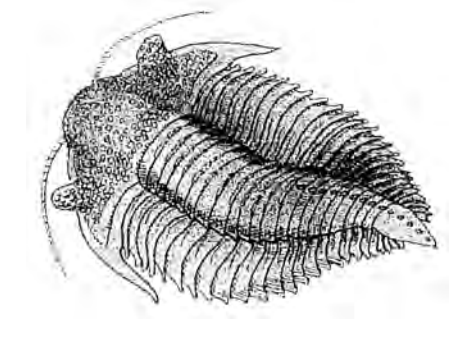
For thousands of years these shy creatures have been linked with myths about mermaids. Early sailors saw mums with babies and thought they were women with fish-like tails....or so the story goes.

Creature Feature

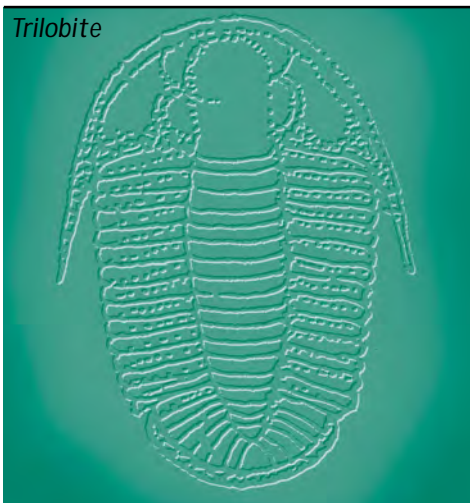
Fossilised Creatures of the Ancient Seas



Nautiloid



Trilobite



Arandaspis prionotolepis

In the Adelaide museum is a small piece of sandstone with the imprint of an ancient fish. It was collected at Mount Charlotte, near Maryvale, south of Alice Springs, in 1959 by scientist David Taylor.

It is no ordinary fish! At around 480 million years old, it is Australia's oldest backboned animal and one of the world's oldest fish.

The name it's been given is quite a mouthful: *Arandaspis prionotolepis*. The first part of the name honours the Aranda people of Central Australia. The second part comes from the Greek word *aspis* which means shield. It refers to the bony, protective plate which covered the creature's head.

It was not a very big fish: only 15 centimetres long. Unlike modern fish, it had no jaws or teeth, and no fins on the top, sides or bottom of its body. It certainly wasn't very good at fast turns or screeching halts, but it was the best model around at the time!

In those days much of Central Australia was covered by a shallow sea. The land was bare and lifeless, just like the Moon is today. Fish weren't the dominant creatures in the water, the seas belonged to the

invertebrates: animals like sponges, jellyfish, nautiloids and trilobites.

Nautiloids were relatives of squid and octopus. They had tough, protective shells, up to 4 metres long. With their sharp eyesight and powerful tentacles, they were fearsome predators.

Trilobites were abundant at the time. They were among the first animals to be equipped with hard body parts. (They were related to crabs and other crustaceans.) Most were only a few centimetres long, or less. The largest grew to half a metre in length.

More than 2,000 different trilobite species have so far been identified by palaeontologists. They were mainly bottom-dwellers but a few swam near the surface.

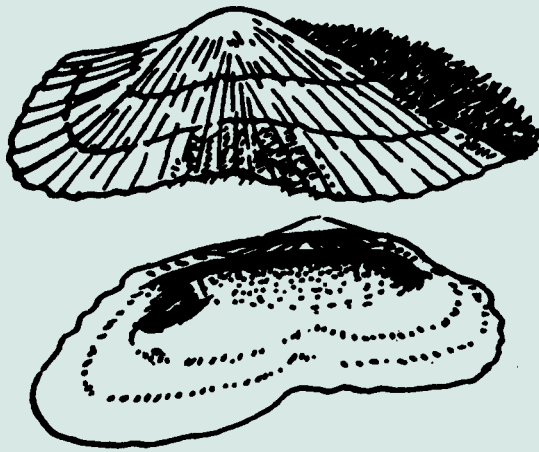
Some had spikes on the shells for protection. Others just curled into a ball when in danger.

The name trilobite means "three lobed" and refers to the 3-humped hard plates arranged in a row down its back.

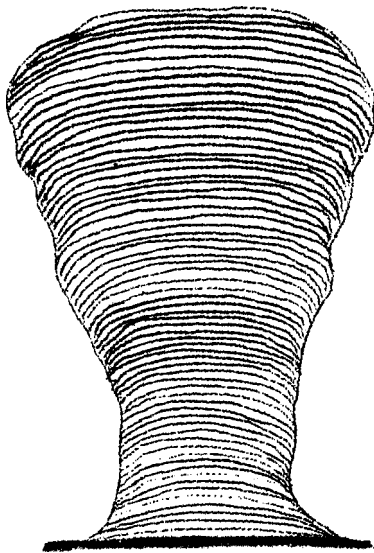
Trilobites inhabited the seas for a very long period of time but then gradually died out. Fossil trilobites are rare in rocks younger than 350 million years old.

Creature Feature

The Ancient Seas of Katherine



Noah's ark shell



Stromatolite

Preserved in the rocks of the Katherine region is abundant evidence that the area once lay beneath the sea.

Fossils of ancient jellyfish, shells, trilobites, fish and other marine life are preserved in the rocks. Near the Katherine hospital, for example, is a limestone-covered hill containing fossilised coral. Ancient forms of seaweed are preserved in a sedimentary rock called porncinalite which forms the hard caps of tabletop hills.

These ancient, ocean plants and animals lived in the Katherine area from 395 to 345 million years ago, in the periods of time known as the Devonian and Carboniferous eras. This was well before the dinosaurs roamed the earth in the Jurassic era.

In Limestone Gorge at Gregory National Park, near Timber Creek, are fossils of a much more ancient form of marine life: stromatolites. Stromatolites are large, mushroom-shaped columns, built in warm, shallow seawater by colonies of cyanobacteria (blue-green algae).

The only place on earth where stromatolites still grow today is at Shark Bay in W.A. The columns are a metre or so in diameter.

Fossil stromatolites have been found in Australia dating back to 3.5 billion years ago.

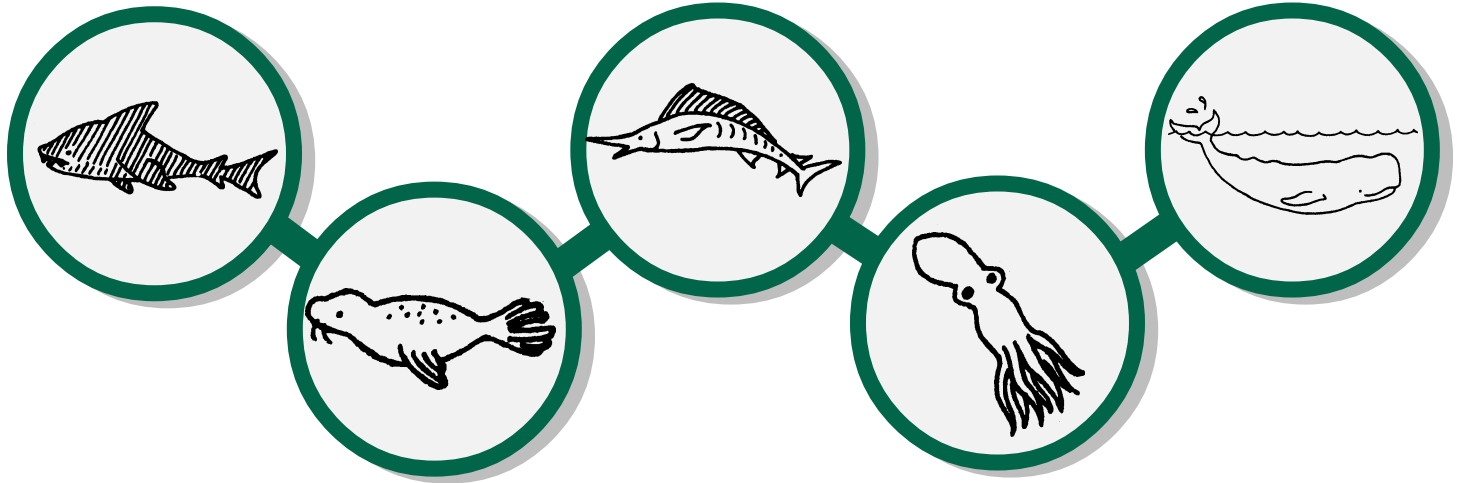
Things we see in the sea

You won't find any trilobites in the seas today. But here's a list of 33 things you may find.

- | | | |
|----------|------------|------------|
| barnacle | noah's ark | sandpiper |
| bream | oar | sea urchin |
| coral | osprey | shag |
| cray | oyster | shark |
| dugong | pearl | sponge |
| groper | pen | starfish |
| gull | pipefish | stinger |
| ice | pipi | trepan |
| kelp | porpita | whale |
| kite | prawn | whelk |
| mako | rockcod | |

P	S	P	L	L	U	G	N	O	G	U	D
L	T	N	I	H	C	R	U	A	E	S	L
E	A	O	O	P	P	O	R	P	I	T	A
K	R	A	H	S	I	P	R	A	W	N	R
L	F	H	G	A	P	E	B	C	S	B	O
E	I	S	N	N	E	R	R	R	P	A	C
H	S	A	A	D	F	E	E	A	R	O	K
W	H	R	P	P	I	G	A	Y	N	N	C
R	A	K	E	I	S	N	M	K	G	A	O
A	G	N	R	P	H	I	I	C	E	C	D
O	Y	S	T	E	R	T	W	H	A	L	E
O	K	A	M	R	E	S	L	R	A	E	P

Some great web sites to visit



Adopt a Cyber Crab
<http://www.geocities.com/RainForest/6296/adopt.html>
Just what the title says. A little bit of fun.

Dragon Search
<http://www.dragonsearch.asn.au>
A monitoring program to provide information about the unique sea dragon of southern Australia.

Environmental News Network
<http://www.enn.com>
Ocean-related news stories, breathtaking multimedia and an area for you to pledge your support to saving our oceans. Get into it!

Exotic species and ballast water
<http://massbay.mit.edu/exoticspecies/>
Interested in marine bio-invasiders, ballast water, aquaculture, etc? Then this is the place for you.

Nudibranches
<http://www.diveoz.com.au/>
Excellent information. The main Dive Oz site will also be of considerable interest to many.

Oceans Alive
<http://www.abc.net.au/oceans.htm>
Celebrating our marine diversity and exploring ways we can save our oceans. This web site is designed to grow over coming months. Includes whale dreams; jewels of the sea; cool wet facts; and sea rangers.

Plankton Net
<http://www.uoguelph.ca/zoology/ocean/index.htm>
Zooplankton scurry around the screen as you get caught in the plankton net. It's well worth a trip.

Savage Seas PBS
<http://pbs.org/wnet/savageseas/>
Companion site to the American TV series. Includes shipwrecks; ocean rescues; a deep sea section; cyclones; icebergs; and El Nino. Additional features include Ask the Expert and Facts from the Sea.

Sea Mammal Ecology Group
<http://www.zoo.latrobe.edu.au/sdg>
Describes research being undertaken on marine mammals in Australia.

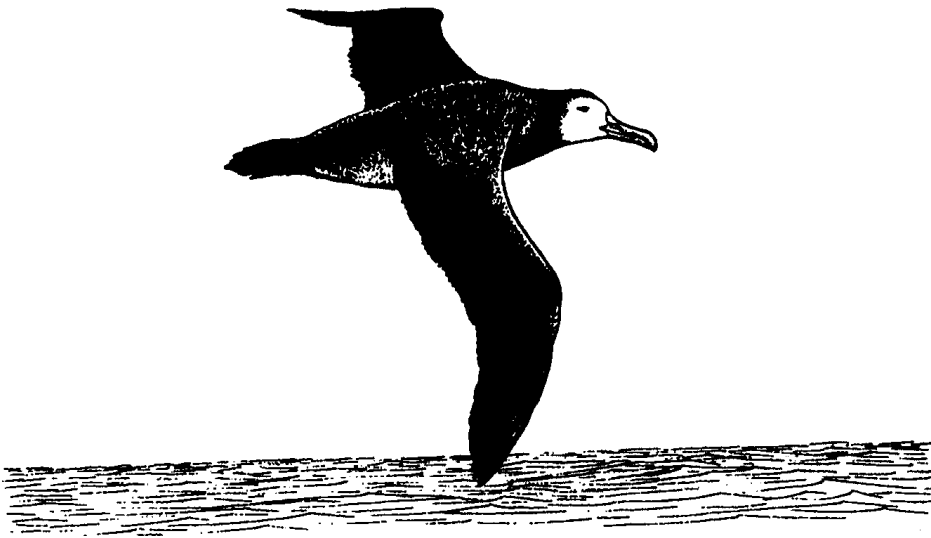
Sharks
<http://www.enchantedlearning.com/subjects/sharks/allabout/>
Lots of information and pictures.

Tidal Projections for Australian Ports
<http://www.ntf.flinders.edu.au/TEXT/TIDES/tides.html>
The tidal projections for yesterday, today and the next 5 days.

The Wading Pool
<http://www.cmc-ocean.org/wading/wading.php3>
The kids section of the Centre for Marine Conservation site with online games and activities to print out.

Whales: Oceania Project
<http://www.oceania.org.au>
A rich source of information on Humpbacks in Australian waters.

Whales: South Australian Whale Centre
<http://www.webmedia.com.au/whales/whcent.html>
The South Australian Whale Centre monitors the locations and activities of all whales sighted across South Australia and Victoria.



Longline Fishing

In the icy waters of the Southern Ocean high tech, steel-hulled fishing boats pursue the Southern Bluefin Tuna. The fish is highly prized on the Japanese market.

The boats operate 24 hours a day. Behind them, they lay out lengths of fishing line 150 kilometres long. Each longline carries over 3,000 baited hooks. Every 10 or 12 kilometres is a radio buoy, used to locate the line when the time comes to haul it in.

Thousands of albatrosses and petrels are being killed in the process. These birds are attracted by the fish and squid that are used on the longlines as bait.

The birds dive for the bait, swallow it hook and all, are pulled underwater and drown.

Frightening Fish Facts

- The quantity of fish in the oceans has dropped by one third.
- Nine of the world's seventeen major fishing grounds are seriously in decline.
- More than 60 million tonnes of fish are taken every year. Another 20 million tonnes of unwanted marine life are thrown overboard, dead.
- At least 44,000 albatrosses are killed each year as a result of longline fishing in the Southern Ocean.
- There are less than half the number of seabirds in the world in 2001 than there was in 1901.
- Of the world's 24 albatross species, 4 species are considered endangered and 18 are threatened. Longline fishing is the major cause. The birds' biology further complicates their plight. They do not reach breeding age until they are at least 10 years old. The birds pair for life and only raise one chick at a time. It is tended by both parents for 9 months or more. If one of the adults dies, it is likely the chick will perish.

PUZZLE ANSWERS

Nature Quiz (page 4)

1. Bluebottles
2. True
3. Prawns, crabs and lobsters are decapods. They have 10 limbs.
4. Together with French engineer Emile Gagnan, he invented scuba gear: self-contained underwater breathing apparatus.
5. Predatory Moon Snails drill through the hard shells and eat the flesh.
6. Macassar is now part of Indonesia. They sailed to Australia each year to collect animals called trepang, or sea cucumbers, which they sold to the Chinese.
7. The Pacific is biggest, followed by the Atlantic, Indian and Arctic.
8. They can walk forwards. The others can only crawl sideways.
9. Giant squid
10. It's called Challenger Deep and is

near the Philippines. In 1960, the 3-man bathyscaphe Trieste descended to this spot which is 10.8 kilometres beneath the surface.

What's my name? (page 4)

Brown Booby

Plant Profile (page 5)

The pollen grains are strong swimmers.

On the Brink (page 7)

Steller's Sea Cow

Around the Traps

Darwin

Life started in the oceans, and today the greatest variety of animals can be found living in the oceans. We take a look at some of these better known animals (dugongs) and some of the older life forms (trilobites) in this special marine edition of the Review.

Have you ever wondered where all the water in the oceans actually came from? Scientists have worked out that the Earth formed about 4 and a half billion (4,500,500,500) years ago as a molten ball. As the molten ball began to cool down the earth's crust was formed, and as you can probably imagine there was a lot of steam around while the cooling took place. The steam condensed and was released in massive thunderstorms, which would make the Top End's wet season look like a light sun shower! The water that was released then became our oceans.

But it doesn't stop there! How did life begin in our oceans and on land when oxygen was not present on earth all those billions of years ago? Well the atmosphere contained other gases (many that would be deadly to us today), and

these, combined with the environmental conditions of the time allowed many types of organic molecules to form by simple chemical reactions.

As the number and variety of these increased, some, called cyanobacteria developed an ability to use sunlight. They combined sunlight with water and carbon dioxide and were able to make sugar. This process is known as photosynthesis. Oxygen is also produced and released as part of this process. As oxygen began to build up in the atmosphere many of the organisms that had lived in an oxygen free world could not survive. Those that did survive are now the ancestors of our current life forms.

Amazingly we are still able to see the earliest evidence of life on earth today. In Shark Bay, Western Australia cyanobacteria have formed dome shaped structures called stromatolites which date back three and half billion years! Today oceans cover 71% of the surface of the earth and scientists are still discovering new life forms in our seas every year. Happy reading!

G'day from Ranger Bill

Welcome to the first edition for 2001! We hope you enjoy this special edition of the Junior Ranger Review where we take a closer look at our fascinating marine environment.

The Northern Territory currently has a single marine park called Garig Gunak Barlu National Park (formerly known as Cobourg Marine Park). The Commission also manages other coastal reserves and parks, which border and includes elements of marine habitats. Such estate includes Casuarina Coastal Reserve, Charles Darwin National Park, Channel Island Conservation Reserve and Barranyi (North Island) National Park.

Cobourg Peninsula became the Territory's first reserve for the preservation of flora and fauna in the north of Australia in 1924. In July 1983 the waters surrounding the Park were declared a marine park under the Territory Parks and Wildlife Conservation Act 1977 - 1985.

To help us to better manage the marine park the Parks and Wildlife Commission recently ran a training camp for Commission staff to

increase their marine survey skills and collect valuable information at the same time.

Rangers were involved in analysing satellite and aerial images of the marine park to identify areas of different marine habitat.

Staff were also introduced to acoustic (sound) surveys. In these surveys a special depth finder is used. It is more or less the same as a sounder that you would use when you go fishing and want to find where your fish are. A computer records the data that comes from the depth sounder. Scientists have a look at the data and then produce maps, which show what the bottom of the sea floor consists of, whether it was sand, rock, mud, coral or rocky reef.

Rangers then dived along specially marked lines to make sure that the results from the acoustic surveys were correct. This involved underwater videoing and taking actual samples. Rangers also identified habitats and life forms while diving.

This information will provide a clearer picture of what is out there and will help in managing the park.

Katherine

Happy New Year to all the Katherine Junior Rangers from Ranger Andrew, and I hope you've all had great holidays with lots of experiences and stories to tell.

The 2001 'wet' season has finally turned it on (it was a very slow start here) with some very good rainfalls being recorded. The Katherine River has risen and fallen a few times indicating that large rainfalls have occurred well up in the catchment areas above Katherine Gorge in Nitmiluk National Park.

Lots of water creates great frog breeding conditions. Frog Watch will be run on each Wednesday in the month of March on the 7th, 14th, 21st and 28th, so get ready to get your feet wet, and your ears and eyes tuned in to the sound and rare sightings of our fantastic native frogs.

Frog Watch will change forever this wet season with the addition of another amphibian. Yes, the infamous 'Cane Toad' has arrived in Katherine. They are already sitting around the house lights at night and they are very large.

Whilst Junior Rangers will record cane toads on our frog watch surveys, we will not be capturing them. There is a good reason for this, and it is because there are simply too many of them. Any amount of killing and removing them from areas has no effect, simply because other toads will quickly move in. As cane toads also secrete a toxin, to avoid the risks Junior Rangers will not be catching cane toads at Frog Watch. However, wait for it, Junior Rangers will be shown ingenious methods of ridding your house yard from toads so that your native frog species can be saved. This will be held as a special activity during the start of the 2001 Junior Ranger Program. Cane toad numbers eventually drop naturally, however this will take time, and we have to let nature do its work.

Here is a brief story. Ranger Andrew ran Junior Rangers for the School of the Air for an end of year activity. We had just about finished in the pouring rain when we came across an Acacia tree full of Goliath stick insects, there were about a dozen frantically feeding on fresh growth on the Acacia. For a few amazing minutes Frog Watch turned into Giant stick insect watch, it was a real thrill. Hope to see you all at Frog Watch.

Bye from Ranger Andrew

The Junior Ranger Review is produced 4 times a year by the Parks and Wildlife Commission of the Northern Territory. This edition was written by Stuart Traynor and design and layout are by Big Picture Graphic Art. The cover was drawn by Robbie Henderson. Illustrations in this edition are mostly by Bob Whiteford.

**Contributions are welcome
and should be sent to:
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