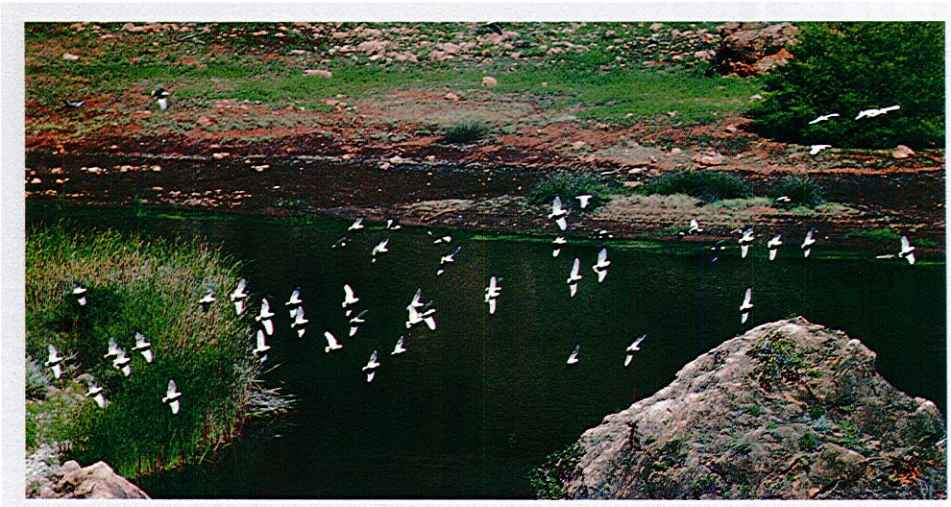
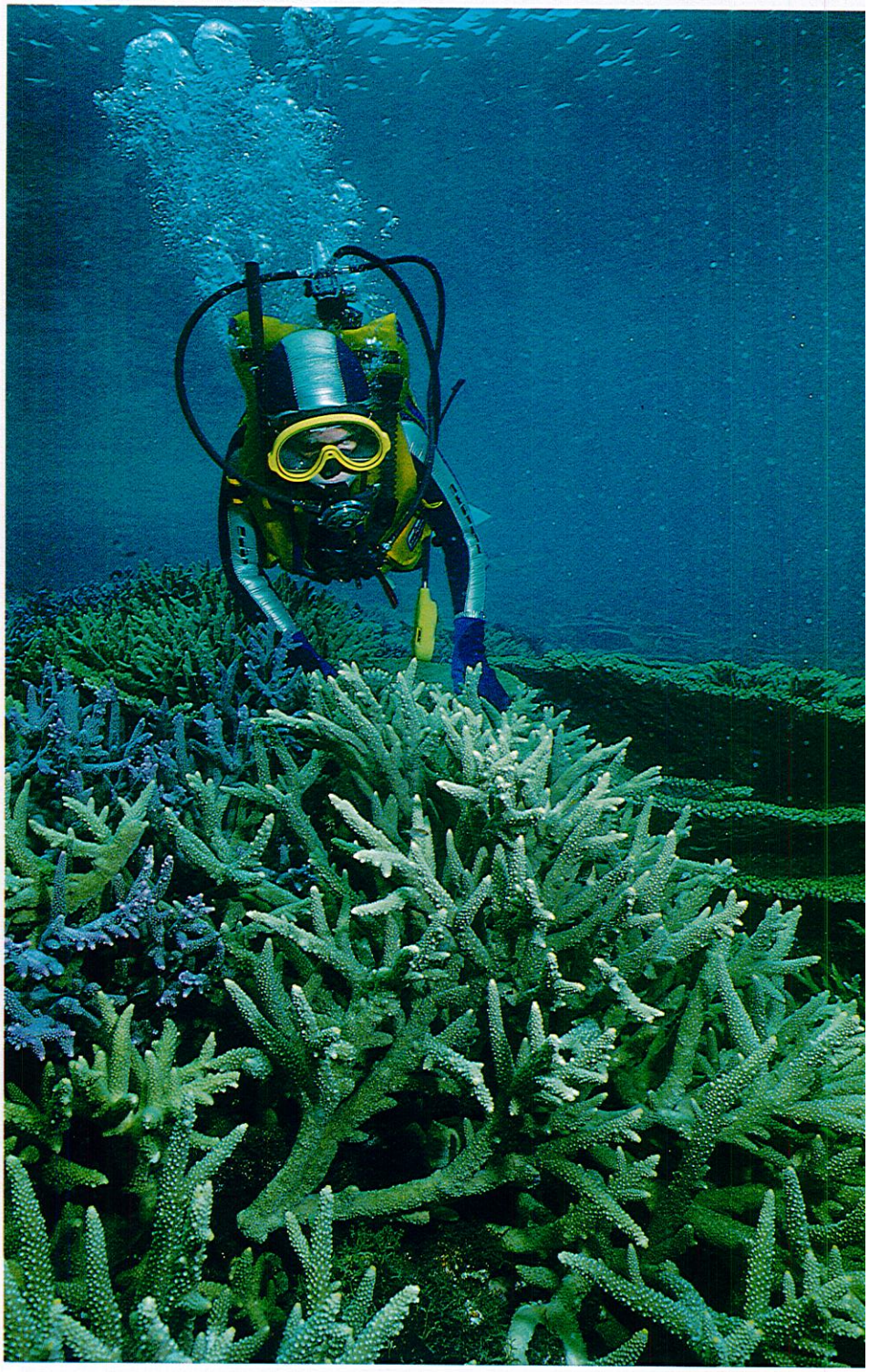
RANGE TO REEF

DISCOVER CAPE RANGE NATIONAL PARK AND NINGALOO MARINE PARK



DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT



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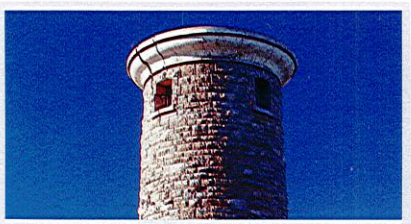
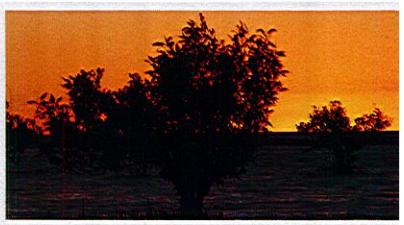


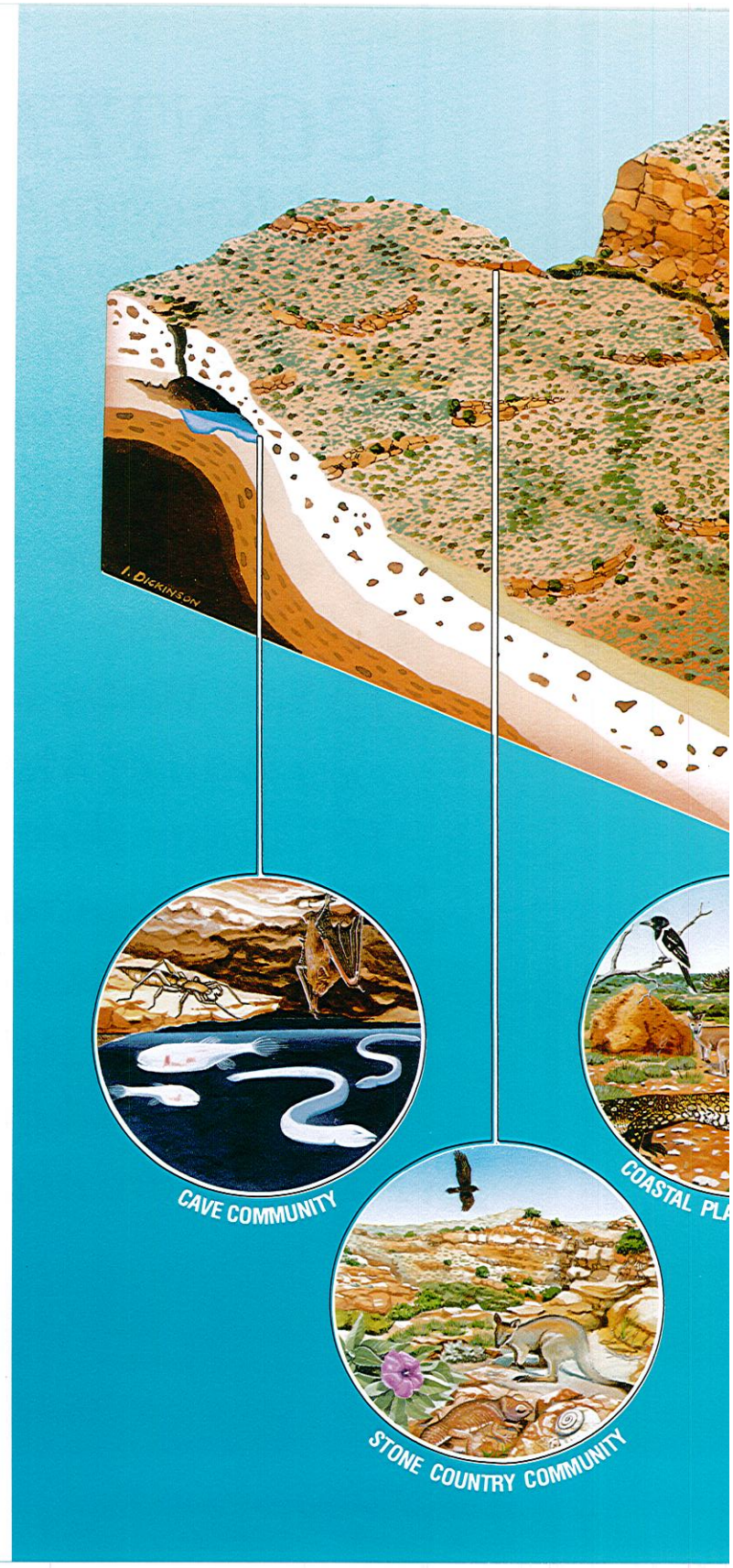


Range to Reef

In the vicinity of the Cape Range Peninsula it is possible to pass from high plateau shrubland to deep ocean within a distance of only a few kilometres. Hike through eucalypt woodlands or climb down deep rocky gorges and enjoy breathtaking scenery. Walk over a flat spinifex plain and a succession of ancient fossil reefs, climb coastal dunes down to sandy beaches and laze in the sun. If fishing or snorkelling are your interests, dive into an emerald lagoon and swim over a coral reef, or take a boat through the reef passages, beyond thunderous surf to the open ocean.

As you enjoy these activities you will pass through the habitats, or dwelling places, of many creatures: some as exotic as fish-eating cone shells and some as familiar as the red kangaroo; some as tiny as coral polyps and some as thrilling in their size as the whale shark and great whales.

We invite you to explore these natural beauties and observe the inhabitants of a virtually undisturbed world. This book will provide you with memories, or make a gift for someone with whom you would like to share your north-west trip.

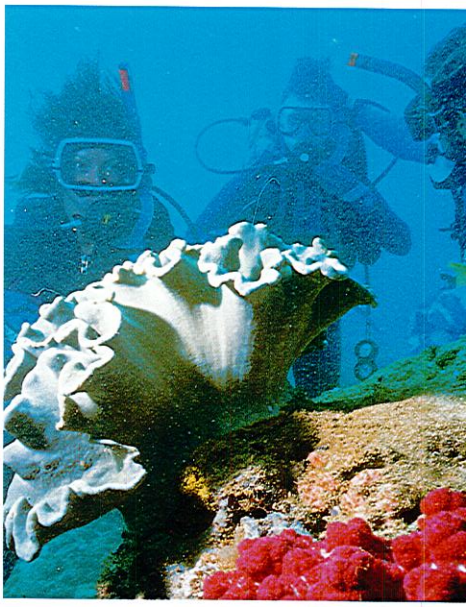



COMMUNITY
LAGOON COMMUNITY
CORAL COMMUNITY
OCEAN COMMUNITY

Parks of the Peninsula

Ningaloo Reef is Western Australia's largest coral reef. To protect this natural wonder the State and Commonwealth Governments jointly declared the Ningaloo Marine Park in 1987. A portion of Cape Range Peninsula was earlier declared National Park, and together the two parks offer a variety of scenery, wildlife and recreational opportunities rarely equalled in one locale.

The primary objective of park management is to provide for as much public enjoyment of this wild and wonderful place as is consistent with its maintenance and protection for all time.



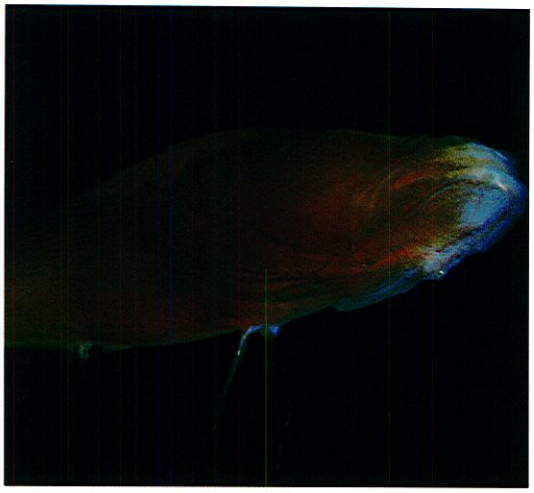
Above:Euro at Osprey Bay, with a coral reef in the background.

Above Right:Soft-corals interest three divers on a deep rock ledge beyond the reef.

Right:The beach at Vlaming Head, North West Cape, is a popular recreational spot for the people of Exmouth.

Opposite page: Craggy limestone hills ,Shothole Canyon

Range of Wildlife



Right: The Blind Gudgeon *(Milyeringa veritas)* is a troglodyte, living in the water of caves and rock strata beneath Cape Range and its coastal plains.

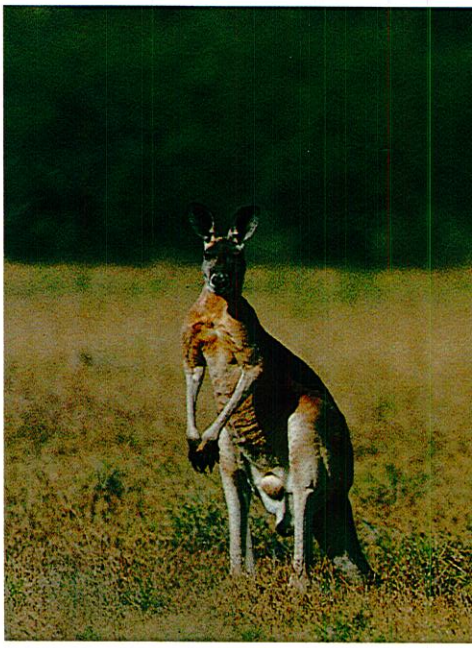
Below right:Red Kangaroo *(Macropus rufus)*. Both Reds and Euros have become tame and abundant in Cape Range National Park.

Below:A male Spotted Bower-bird has succeeded in attracting a mate to his bower with its decoration of stones.

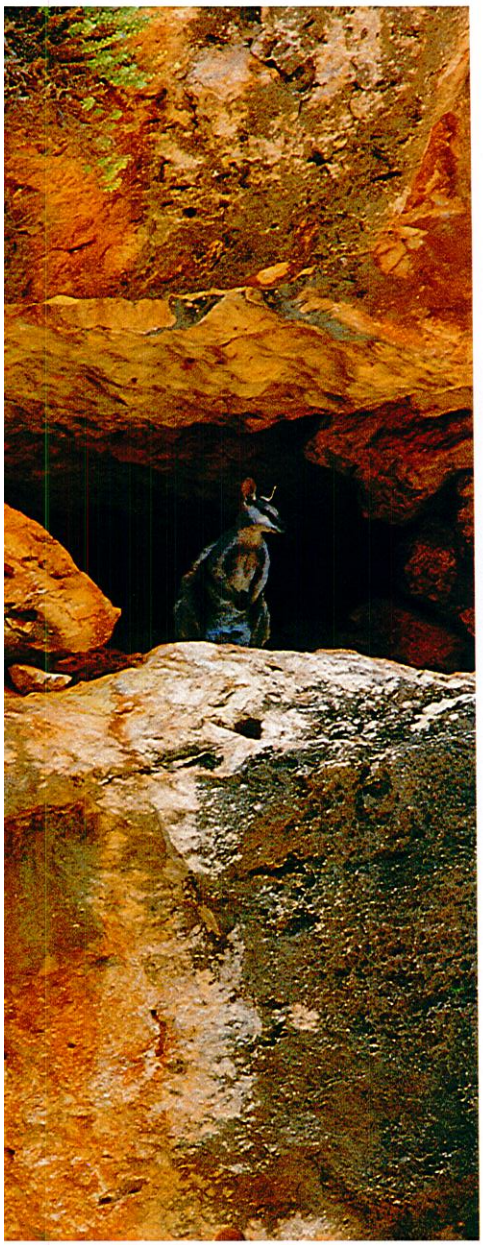
The nature trails in Cape Range National Park are sited so that vi have a good chance of seeing many animal species at close quarters. Enc at the Milyering Bicentennial Visitor Centre for information and guidanc

Late in the 19th century some of the coastal plains below Cape Range, an the lower, flatter coastal lands furthe south, were taken up as pastoral lea However, since 1964 no sheep have grazed, and no hunting has been permitted in the northern national p areas, so wildlife has prospered.

The abundant fauna of the Cape Rar Peninsula is typical of the arid Pilba Region, but due to its relative isolati and geological history it has some peculiarities. Some species have evo distinctive forms, while others now unique to Cape Range were once mo widespread in northern Australia. L and irregular rainfall and limited occurrence of fresh surface water me that the permanently resident anima are adapted to living in harsh condi



ıt 100 kinds of land birds have been ·ded from Cape Range, though some ese are temporary immigrants after There are also many species of e birds, including some annual ants from the northern hemisphere, h feed along the Marine Park :line.



Left: Big goannas *(Varanus panoptes rubidus)* are commonly seen in Cape Range National Park and may be approached with care.

Far left: A rock-wallaby *(Petrogale penicillata)* sits on the cliff-face at Yardie Creek, waiting for the evening when he can safely feed.

Below:Ospreys *(Pandion haliaetus)* nest along the shore of the marine park. They feed mainly on fish which they pluck from the surface waters of the lagoon.

Range of Vegetation

Although these hot, dry lands cannot boast a wealth of wildflowers like the plains of southern Western Australia, the amateur botanist will find plants of interest, and the novice may be surprised and charmed to discover the occasional delicate flower growing in the hard, hot stony earth.

Because of the geological history of the Cape Range Peninsula, the flora is an unusual mixture of Pilbara, south-west. and northern species. Winter rains allow the existence of south-west species such as Banksia, Hibbertia and Thryptomene, and about ten species of plants are found only on this peninsula.

Below:The Cape Range form of Sturt Pea *(Clianthus formosus)* lacks the black centre typical of this plant elsewhere.

Right:Ranji Bush *(Acacia pyrifolia)*- A harsh, straggling, prickly shrub with usually pear-shaped, blue-green phyllodes and large showy bright golden flowers.

Left:Rock Morning Glory *(Ipomoea costata)*- A climber or woody shrub which is common in the Cape Range area.

Below left:Slender Petalostylis *(Petalostylis labicheoides)*- A slender shrub, the stems and leaves often covered in a waxy bloom, which is widely distributed along watercourses or open plains.

Below: Ashby's Banksia *(Banksia ashbyi)*- A showy, spreading shrub which grows on sandheaths and is the only species of *Banksia* growing on North West Cape.

Terraces of Time

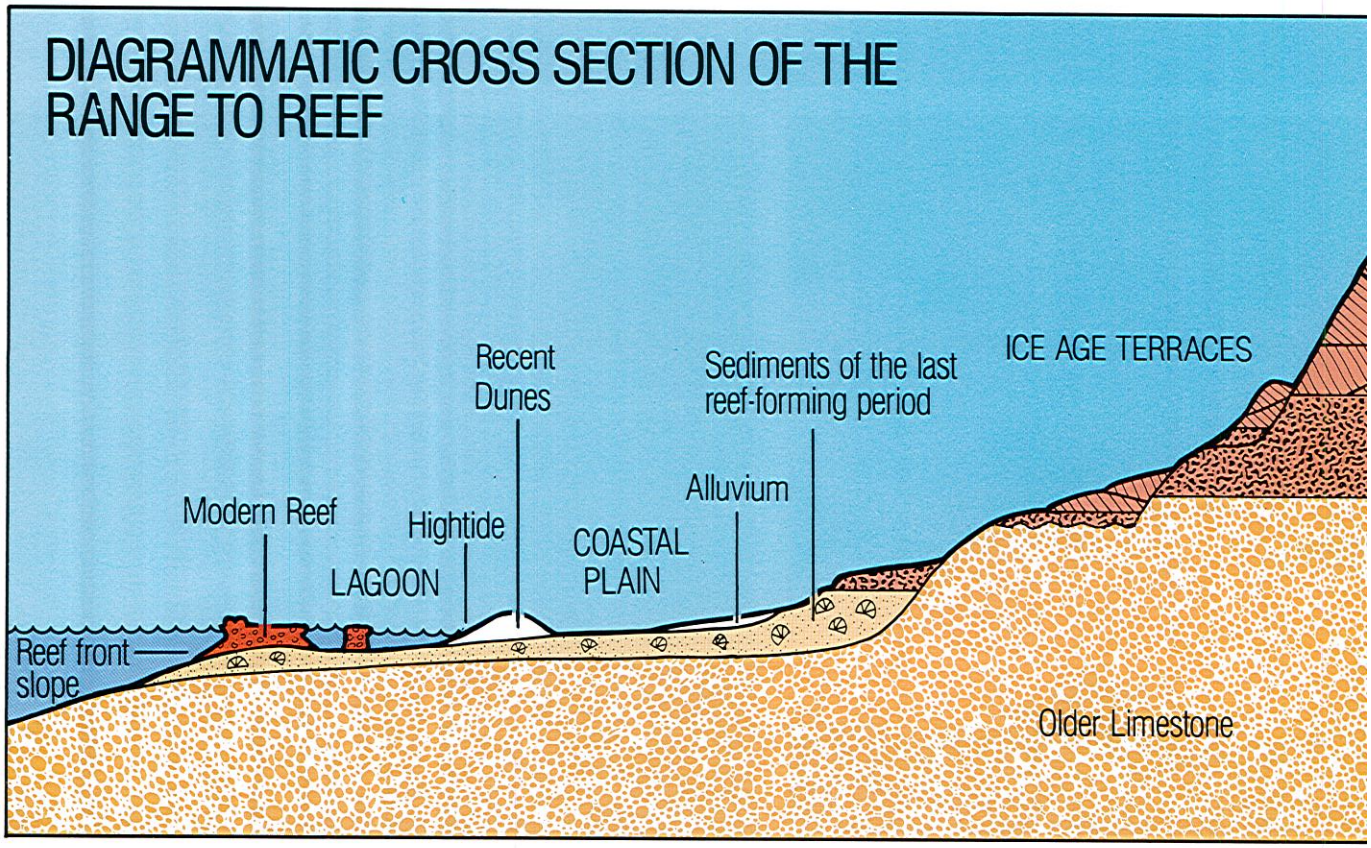
Ten million years ago, the north west corner of Australia was covered by a warm, shallow sea. Later the crust of the earth crumpled and a huge anticline rose to form Cape Range Peninsula. The back bone of the range is hard fossil-bearing limestones, laid down on the sea-floor in those earlier times.

The western side of the peninsula exhibits four distinct limestone terraces cut into the side of the range, reflecting changing sea levels, when ice-ages alternated with warm periods. There are deposits of marine sediments left by the sea on each terrace. Some of these include fossil coral reefs which grew along these shores in those periods, just as the modern reef grows lower dow along the present coastline.

The present day coastal plain is built marine sediments deposited about 4 000 years ago during the last of the h sea-level periods. The fossil species present on the plain are much the sa as the living species on the modern r and very different to those of the ran

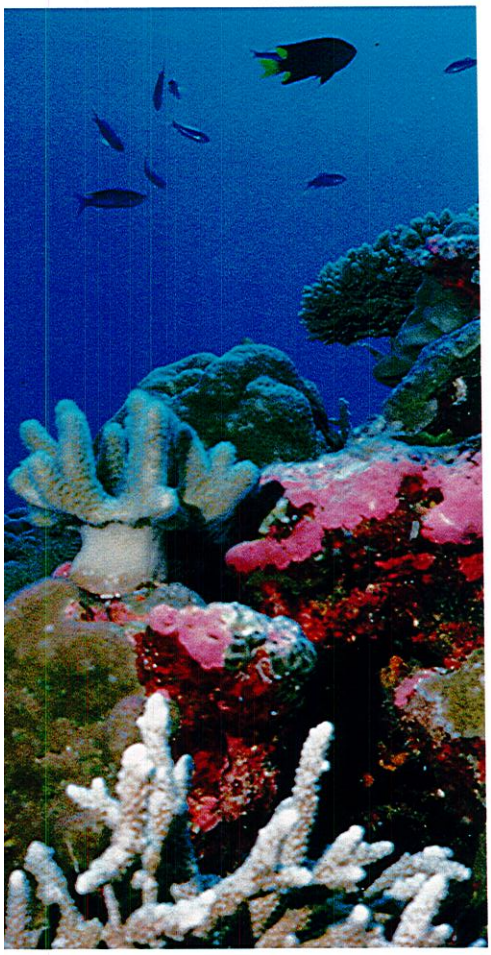
In places below the escarpment fans alluvial stones and sands, carried do from the range by creeks, have sprea over the marine sediments of the pla Along the shore fringe, the modern s and wind have thrown up dunes of sea-sand, some of which have been stabilized by vegetation while others still mobile.

Please remember that collecting fossi the park is not permitted.



ingaloo Reef forms a ragged line of coral, winding down the coast on the ern side of the Cape Range nsula, and running southwards to nerst Point. For much of its 260 km th it is a barrier reef protecting a low sandy lagoon.

r a period of low sea-level during ast of the Pleistocene ice ages, the ose to its present level about 6 000 s ago. We can assume that pioneer ls quickly settled on off-shore stone ridges, grew, perished and e replaced in time. With help from r organisms with limey skeletons, cessive generations built the massive dern reef which we see today.



Nature's Tiny Architects

The living coral forms a crust on accumulated remains of the earlier generations. About 220 species of reef-building corals, belonging to at least 54 genera, have been recorded from Ningaloo Reef.

The majority of coral species, and the associated fish, molluscs, crustaceans and other creatures living on Ningaloo Reef are widespread throughout the tropical Indian and Western Pacific Oceans. For the most part, the animals and plants to be seen at Ningaloo are the same as those on the Great Barrier Reef. There are not quite so many species at Ningaloo, probably because the structure of the reef is relatively simple and there is less habitat diversity.

Left: Corals and other living creatures with skeletons of lime build the structure of the reef and provide habitat for a variety of reef-dwellers.

Below:An *Acropora* bombie at Coral Bay provides home for many fish which became very tame after regular feeding by divers.

Shoreline - Shorelife

Long white sandy beaches backed by vegetated dunes characterize the shore of Ningaloo Marine Park. Except for a few places where there are large gaps in the protective outer reef, the beaches are quiet and safe for swimming.

In some areas, such as Osprey Bay, there is no beach and low limestone cliffs fringe the shore. The cliffs are undercut by the action of waves and burrowing animals and they are often fronted by intertidal rock platforms.

There is much to see along the shore. Turtles nest on the beaches during summer. Ghost crabs burrow in the sand and provide great entertainment when they quickly scuttle away. Flotsam and jetsam from far away are deposited on these beaches by ocean currents, and the remains of shells and other casualties of the reef and lagoon ecosystem provide fascinating pickings for the beachcomber.

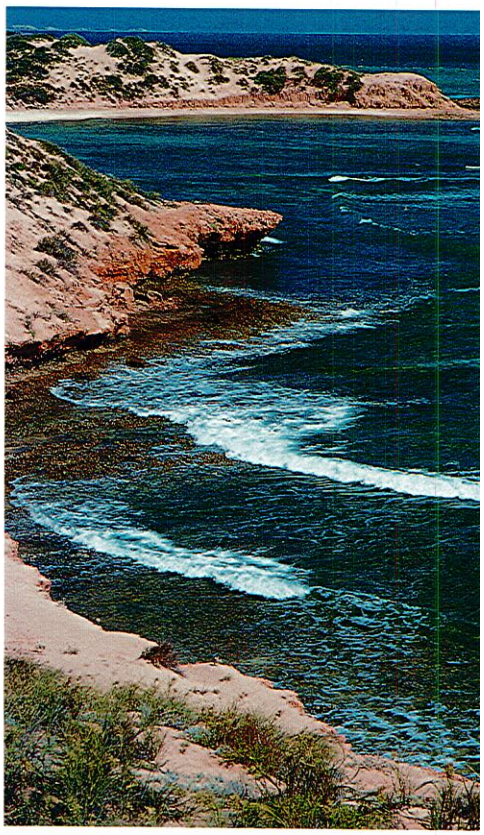
At low tide, sand flats become expos and there you may see a variety of burrowing molluscs, crustaceans an other creatures. Look for their tracks burrows.

On the stony intertidal reef platform there is a great variety of creatures. H and soft corals may be seen in tide p and a small species of 'giant clam', *Tridacna maxima*, is common, attache the rock by its hairy byssus. Under t stones and rock slabs is a host of crustaceans and molluscs, with man shells occupied by hermit crabs.

Shore fossicking is always a great delight. But remember not to tread d the corals, leave stones overturned, o otherwise damage the shore creature their habitat. The park is for their protection as well as your enjoyment

Right:The shore is characterized by long, sandy beaches or low limestone cliffs. Here in the southern part of the marine park, there are undercut limestone cliffs and an intertidal rock platform rich in invertebrate life.

Below:Ghost crabs *(Ocypode convexa)*, inhabitants of the long beaches, scavenge along the water's edge in the evening.



Salt Water Forests

ngrove forests, or mangals, are a
eature of the muddy northern
alian coast. They form a dark-green
along vast areas of shore. They
lt-tolerant, but grow best where
is some freshwater seepage.

in recent years has the ecological
icance of these forests been
ally acknowledged. They are the
e of huge amounts of organic
ial which enter coastal waters and
de a large proportion of the energy
drives the coastal ecosystem. They
reate a muddy habitat for a large
er of specialized animals, and
ry areas for many coastal water fish.

are extensive mangals in Exmouth
on the eastern side of the Cape
e Peninsula. On the open ocean
in Ningaloo Marine Park, the environment is not generally suitable for growth of mangroves. Nevertheless, small but important mangals occur at Mangrove Bay and in Yardie Creek, and there are scattered mangrove trees elsewhere along the shore.Three kinds of mangrove tree are present in the park, *Avicennia marina, Rhizophora stylosa* and *Bruguiera exaristata*.

The Mangrove Bay mangal is the best developed example. It is flushed by a tidal channel and provides visitors with an excellent opportunity to study this peculiar ecosystem. A timber boardwalk and a birdhide have been constructed to assist observation.

Above:A fiddler-crab *(Uca flammula)* sits in the mud near the entrance to its burrow at the edge of the mangrove forest in Mangrove Bay.

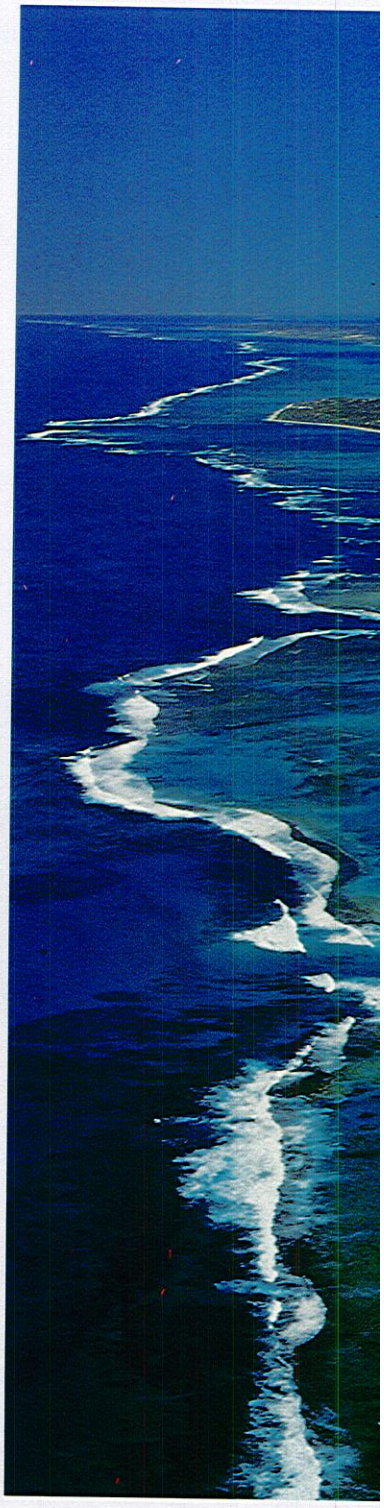
Left:In the brackish waters of Yardie Creek there is a small mangrove forest. *Rhizophora* is characterised by its strange prop-roots.

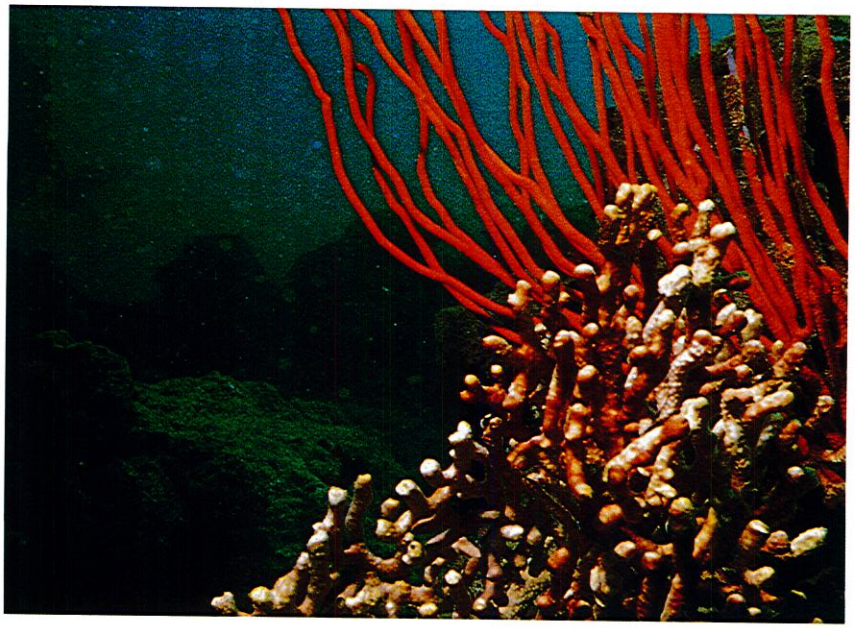
Wall of Mouths

The edge of the continental shelf is unusually close to land in this region, located only a few kilometres from the front edge of the reef. Mighty ocean swells spend their force on the reef edge before spreading in foaming sheets over the shallow reef-flat and pouring into the lagoon behind.

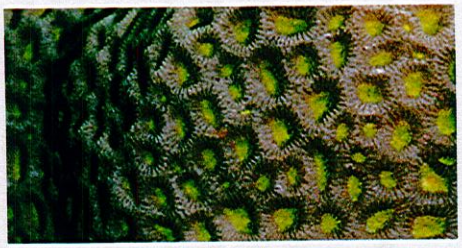
The coral reef owes its existence to this constant flow of clear, warm oceanic water which contains countless numbers of tiny planktonic plants and animals produced in the sunlit surface waters of the open ocean.

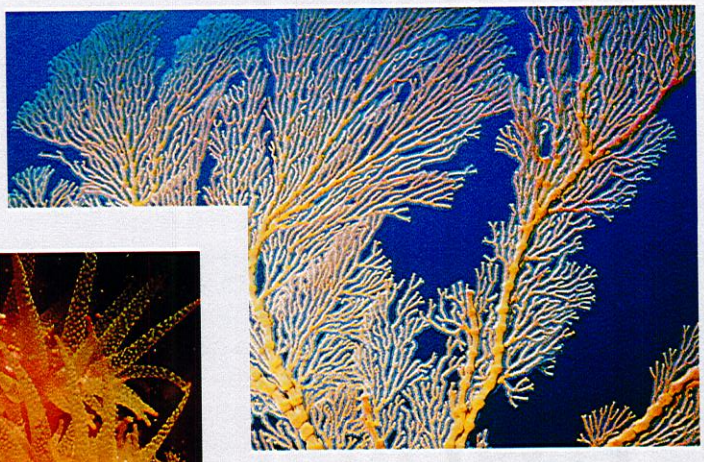
Corals and many other coral-reef animals are primarily "suspension feeders". As the water flows over them, they capture the plankton with an endless variety of filters, mucous traps and sticky tentacles. This 'wall of mouths' concentrates energy from the surface water of the eastern Indian Ocean to support the complex coral-reef ecosystem.

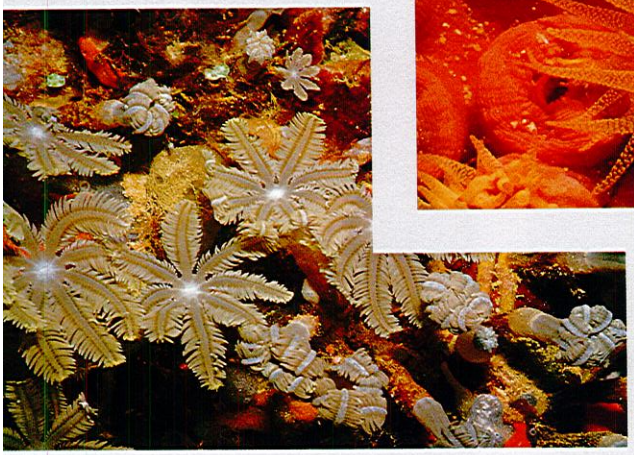




Through the looking glass: A captivating collage of texture and colour await visitors to the underwater world of the Ningaloo Reef.







Cordon Bleu Coral

The fleshy tissues and mucous secretions of living corals are the natural food of many coral-reef animals.

For example, the families of Butterfly-fish, Parrot-fish and Wrasses have many coral-predator species. Butterfly fish have elongated snouts and they delicately nip off protruding polyps from the coral colonies. Coral-eating Parrot-fish and Wrasses, however, bite off and ingest chunks of hard coral, and have powerful grinding plates in their throats which reduce the limy skeleton to rubble. The indigestible skeletal material is then excreted as fine pulverized powder. These fish contribute a great deal to the redistribution of coral matter and to the sedimentation of coral-reefs.

The Crown of Thorns Starfish and several species of marine snail feed on living corals. The purple-mouthed snail *Coralliophilla violacea* lives and feeds on the massive coral *Porites*, and the muricid snail *Drupella cornus* feeds on a greater variety of corals but seems t prefer the staghorns and their relati *Acropora*. All of these coral-eaters oc in the Ningaloo Marine Park.

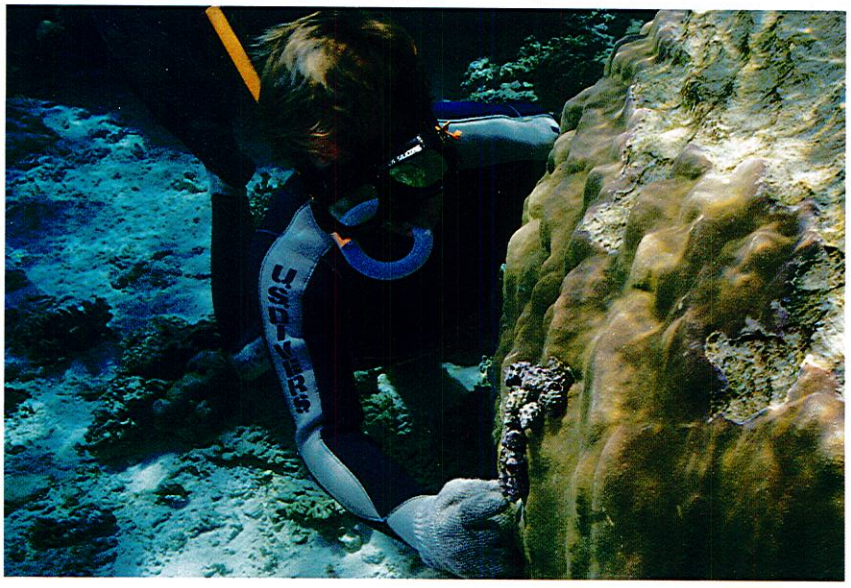
Generally, polyps eaten by predator quickly replaced by asexual buddin within the colony and a balance is maintained in the predator-prey relationship. But sometimes ecologi upsets occur and outbreaks of pred extensively damage coral reefs.

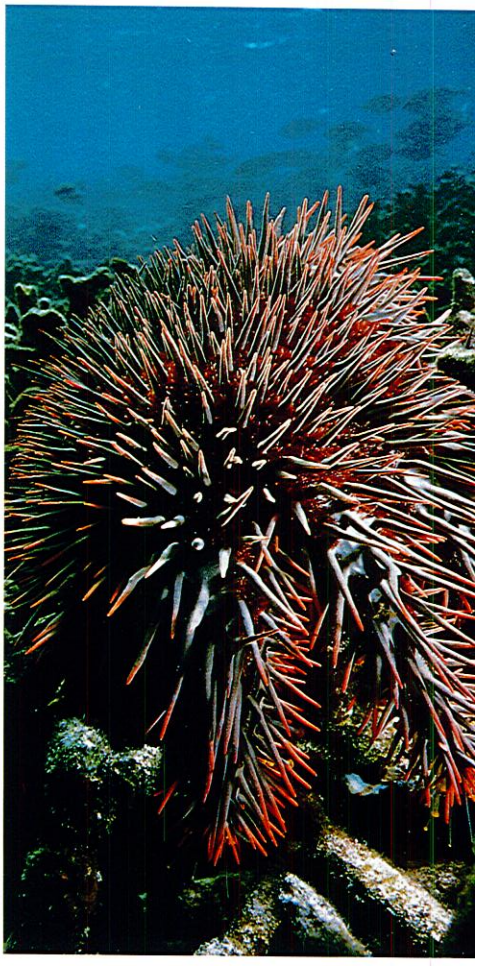
Crown of Thorns is uncommon on Ningaloo Reef. However, *Drupella c* is present in vast numbers in some p of Ningaloo Reef, and has caused extensive damage.

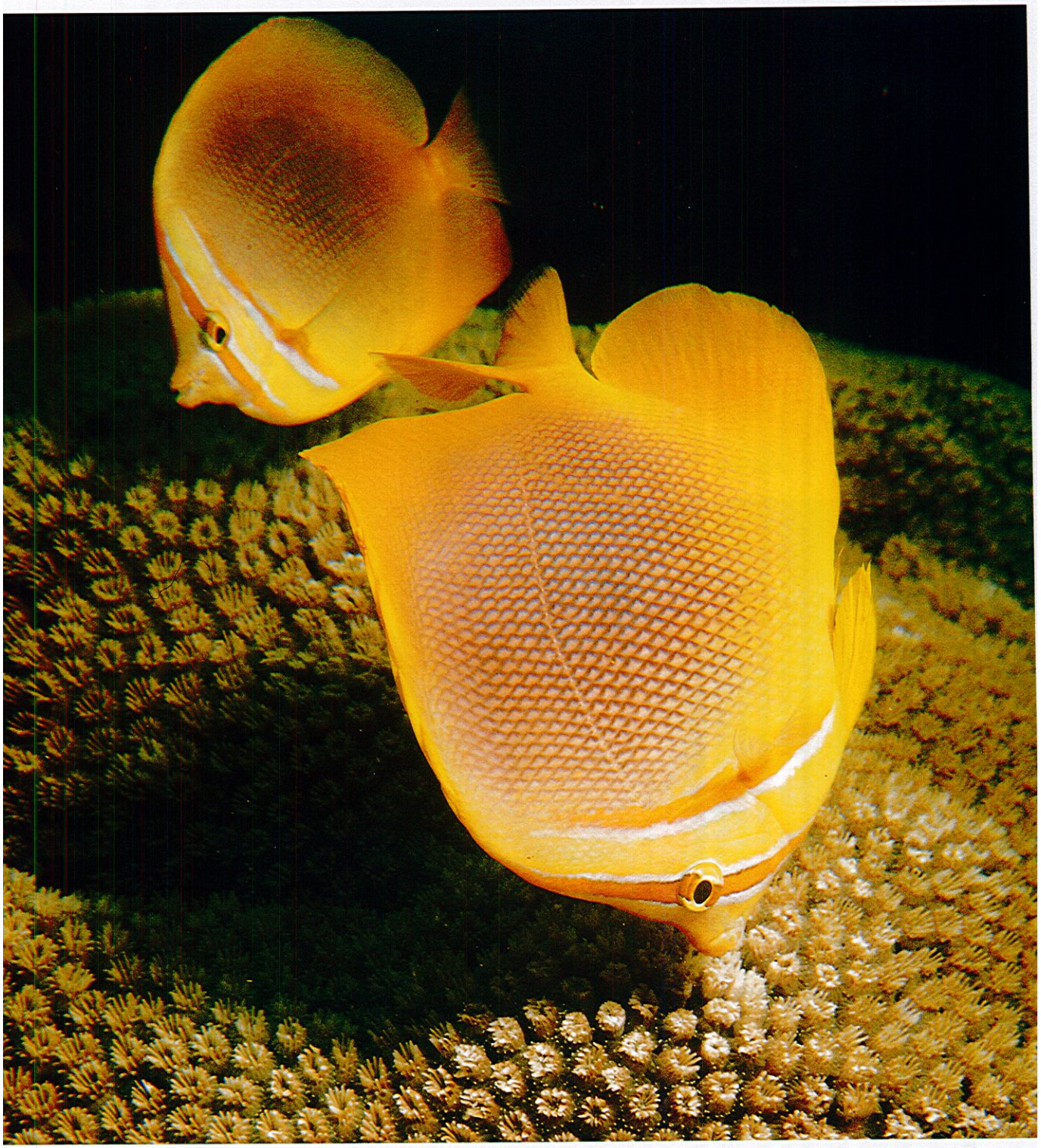
Opposite page: The long snout of a Butterfly -fish *(Chaetodon aureofasciatus)* is a useful tool for pecking at polyps of coral prey.

Right:A large adult Crown of Thorns spreads its spiny arms around its coral prey.

Below:A marine biologist examines a small group of the marine snail *Drupella cornus* feeding on a *Porites* colony.







Coral Condominiums

Right:There are many species of cowry shell in the marine park. This one is *Cypraea eglantina.*In life the thin mantle spreads over the shell and keeps it polished.

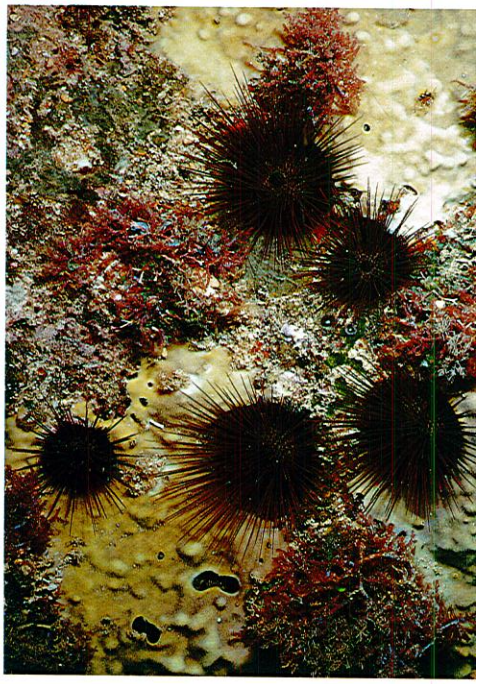
Below:Fan-worms *(Spiro branchus)* live in burrows in massive corals and feed by means of colourful crown tentacles which catch plankton.

Below right:These small, long-spined sea-urchins *(Echinostrephus molaris)* burrow into dead coral rock and help break it down into calcareous silt and sand.

As well as being food for many specialised coral-eating creature living coral provides a habitat for a of reef creatures.

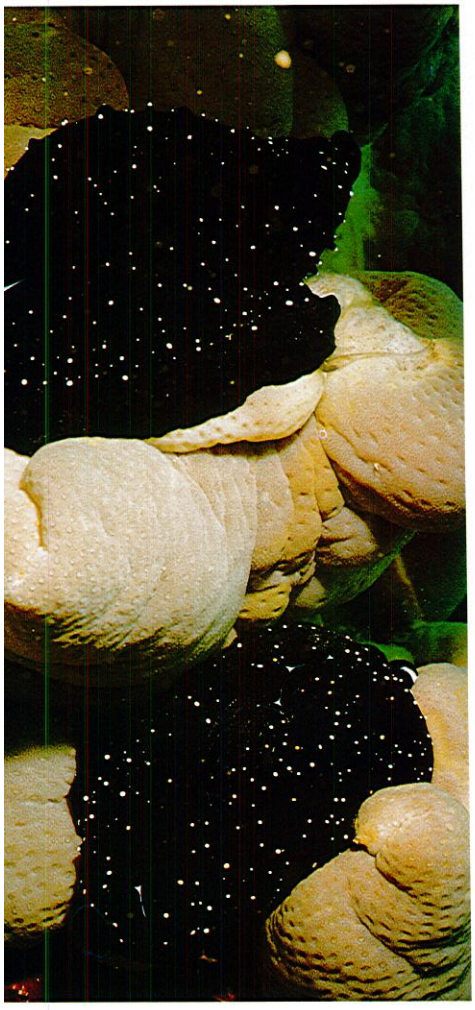
Examples of close association betwe particular kinds of coral and particu species of invertebrates are legion ir coral reef communities. The fan wor are conspicuous burrowers in massi corals like *Porites*. Small crabs of the genus *Trapezia* live among fronds of coral *Pocillopora*. The basis of such ti host-specific associations is not understood.

Several kinds of fish known as Pulle genus *Dascyllus,* live in schools close branching coral colony, which provi their home. They swim in a tight sch within metres of the coral, foraging floating fragments of sea-weed, but when threatened they dart into the shelter of the coral fronds. These colourful little fish are one of the mo charming and conspicuous features the Ningaloo lagoon.



s and crannies among living and corals provide hiding places for kinds of mollusc, worm, oderm, and crustacean. For ple, herbivorous and omnivorous es hide under slabs and ledges g the day and come out at night to e for food.

nis host of colourful and varied ures inhabiting coral reefs which s them such fascinating places for rious visitor or the dedicated eur naturalist. But remember that ting living shells is not permitted in ark.

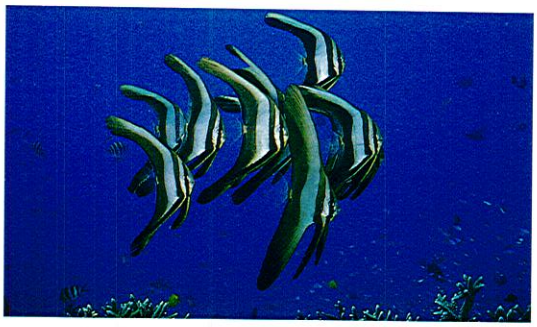


Left:The Ornate Spiny-lobster *(Panulirus ornatus)* is one of the tropical species of this genus. They may be caught by visitors in the marine park, but only by hand.

Far left: Egg Cowries *(Ovula ovum)* feed on the tissues of soft corals. Although the shell is milk-white, the mantle of this animal is jet-black.

Below:Hermit crabs are often vividly coloured. This *Trizopagurns strigatus* has commandeered a dead cone-shell for its home.

Fish Fashion

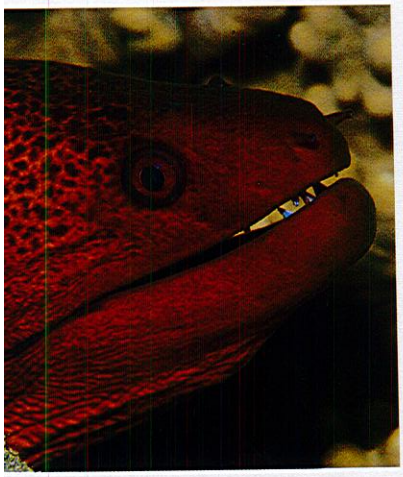


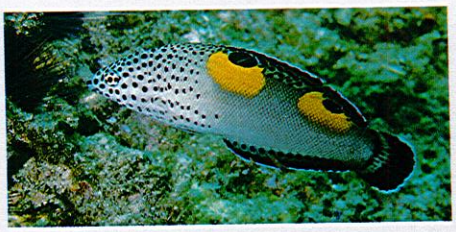
Dashing dandies of the sea: Flirting through the coral fronds, the fish at Ningaloo sport some of nature's most adventurous colours and designs.

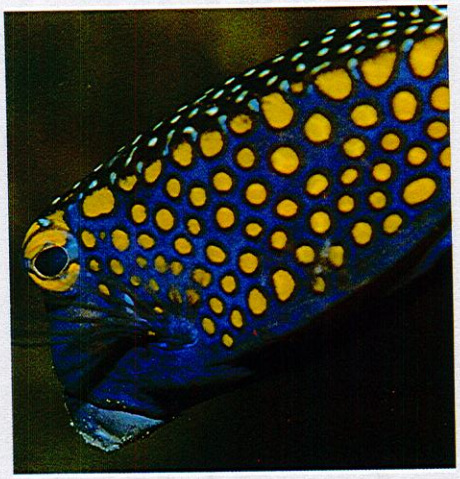
Some coral-reef fish are among the most colourful and beautifully patterned of all living creatures. The variety of size, form and colour is al beyond belief. Striking differences c in colour and pattern between male females, and between juveniles and adult fish of the same species.

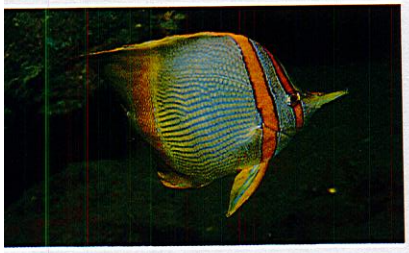
Some fish are fierce, streamlined occ predators capable of swimming at g speed. Others are festooned with camouflaging fronds and fins and m spend their days quietly hiding amc coral and other growths on the sea f

Fish-watching is becoming a popula natural history activity and there is better place for it than Ningaloo Ma Park. Even the novice snorkeller car swim in the lagoon shallows and wi an amazing spectacle of fish variety. far, no less than 500 species have bee recorded by scientists in the park, ar doubt many more remain to be discovered.









Blue Water Behemoths

Beyond the reef the sea-bottom slopes rather steeply and it isn't far out to the very edge of the continental shelf. This is the habitat of ocean monsters.Every year, towards the end of summer, whale sharks appear off the reef. These gigantic fish may be up to 10m long, yet they are slow-moving gentle creatures which feed on plankton. Their annual appearance correlates roughly with the annual mass-spawning of the reef corals, when the sea surface is a virtual soup of eggs and larvae of corals and other creatures. The lucky diver who encounters one of these ocean monsters may safely swim along with them as they quietly go about their business at the surface of the sea.

Another giant ocean plankton feeder is the Manta Ray. These are common off the reef front, and it is sometimes possible to swim with them as well, although they are usually nervous a may not stay for long.

And finally, the ocean waters just beyond the reef are part of the migr route of the mighty Humpback Wh on their way between their Antarcti feeding grounds and their breeding on the North-West Shelf. Every yea early winter the herds appear on th way north, and in early summer the appear heading south again. Noted their haunting songs, these creature often pass within sight and sound c reef.

For some years Humpbacks were ca off Point Cloates and their great boc rendered down for oil, meat and fertilizer at a whaling station at Norwegian Bay. The population declined to dangerously low levels before whaling ceased in 1959. Now after nearly 30 years they are recove and the herds are once again becom spectacle as they pass through the Marine Park.

Below:A Humpback Whale *(Megaptera novaeangli)* breaks its long journey from Antarctica with spectacular games off the reef in the marine park.

ıny marine animals use venoms and oxins for catching prey or .ding themselves. Some of these :ause mild stings or rashes if ct is made with human skin. Only a pecies have venoms and toxins ıt enough to cause serious harm to ıns.

ngaloo Marine Park several erous venomous animals are ınt, although they are secretive and / encountered. The most harmful ıe Blue Ringed Octopus and several :ating cone-shell. These creatures ıeir prey with a potent toxin :ed with their bite, and they are /n to have killed people in other of Australia.

y coelenterates may sting. A few cause serious injury to humans. e are several kinds of large Saucer ish which sting, some of them quite ely. They generally float in the open eyond the reef, but sometimes ar in the lagoon.

very dissimilar stinging hydroids ɔmmon on Ningaloo Reef. Fireweed nbles a feathery fern, but it is not a :, and Fire Coral forms large stony ıies. Both are colonial coelenterates se polyps carry stinging cells which cause a painful rash if divers brush tive areas of skin against them.

y kinds of echinoderm can cause y with their sharp spines, and a few .es have venom associated with the es. The Crown of Thorns Starfish is ɔf these. It has venom glands in the skin covering its razor-sharp spines :an cause painful wounds and ea.

ırchins have sharp spines covering spherical bodies and may cause y. People generally avoid handling e spiny creatures, but accidental ies are not uncommon.

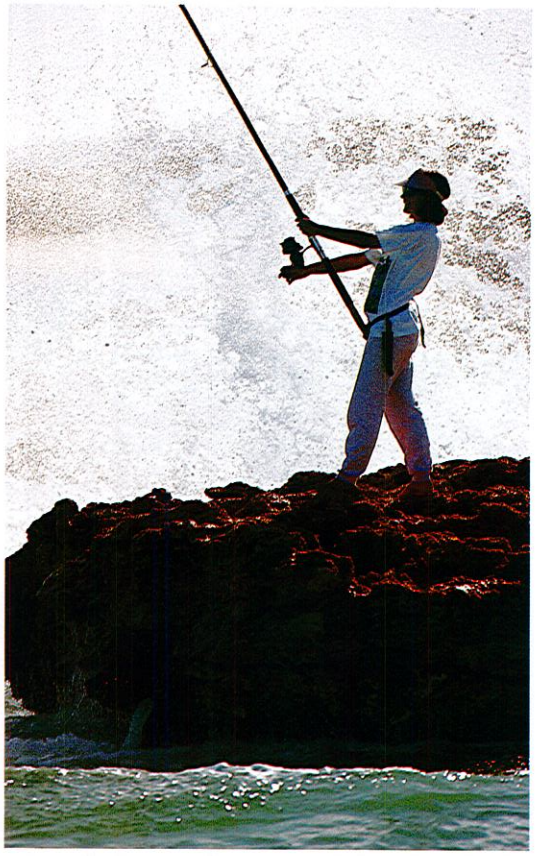
Pretty and Painful

Certain fish have venomous spines. Catfish, or 'cobblers', and Sting-rays are commonly responsible for very painful injuries and there are species of these venomous fishes in Ningaloo Marine Park. The family of Scorpion Fish is particularly notable for venomous spines, the most dangerous of which is the unlovable Stone-fish.

Further details, including treatment in the event of injuries from marine invertebrates, can be found in *Sea Stingers*, by L.M. Marsh and S.M. Slack-Smith, W.A. Museum, 1986.

Below: The Lion-fish *(Pterois volitans)* is a member of the family *Scorpaenidae* and has venomous spines which can cause very painful wounds.

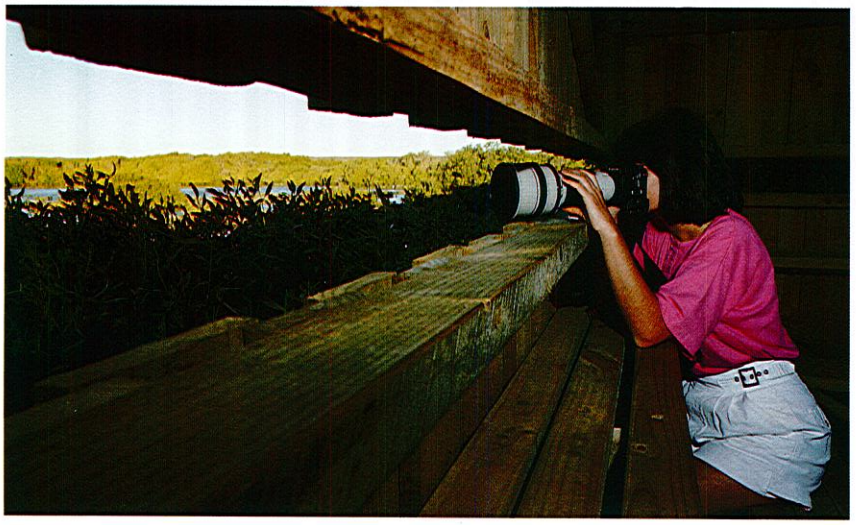
Park Leisure and Pleasure



Right:Fishing from the shore is a fun way of providing a camp meal. Visitors are encouraged to take only as much fish as they can eat.

Below:At Mangrove Bay there is a boardwalk and birdhide where visitors may explore the mangrove habitat and watch shore-birds in comfort.

Below right:Paddling a canoe up the Yardie Creek Gorge is a wonderful way to see wildlife and enjoy the scenery.

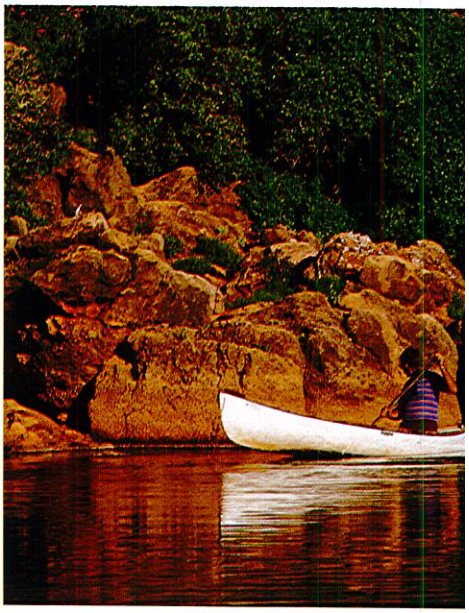


From the rugged range to the cora parks of the coral coast encompa variety of landscapes and wildlife guaranteed to delight the explorer, naturalist and artist alike.

The Visitor Centre at Milyering hou an extensive display which introdu visitors to the natural environment facilities within the parks; for exam geological developments, wildlife communities and the history of hun habitation. The displays are designe whet the appetite and direct visitors towards activities which provide fir hand experiences in the natural surrounds of the parks.

On the side of Cape Range, two dirt roads wend their way into the stone country. For the more energetic, wa trails at Mandu Mandu Gorge, Yard Creek and between the Shothole an Charles Knife roads provide opportunities for closer inspection c undisturbed bush and wildlife amo the cliffs and canyons of Cape Rang

At Mangrove Bay, a short walk amo mangrove trees leads to a hide whic

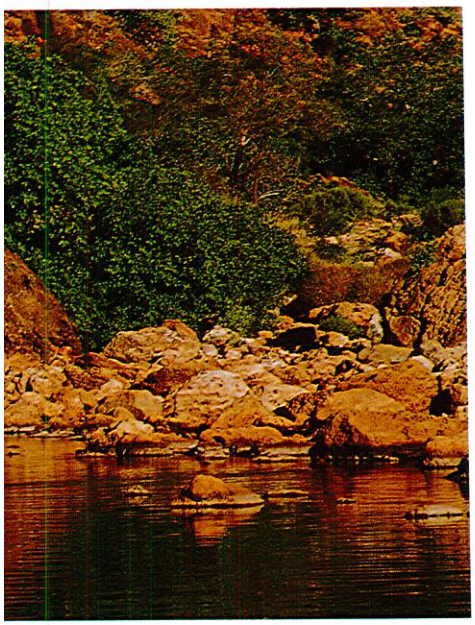


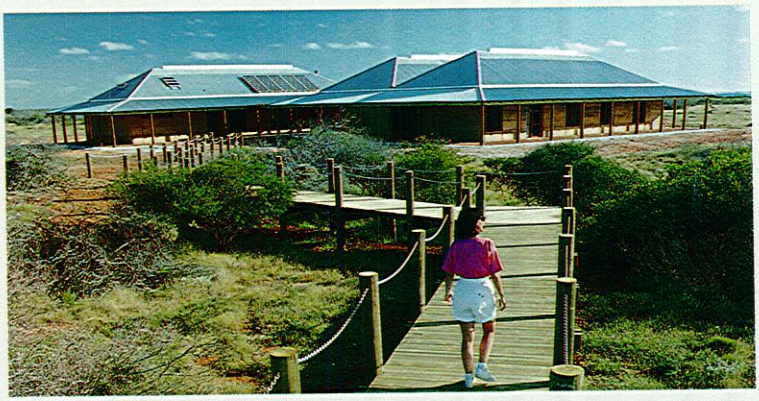
ɔoks a shallow lagoon. Shore birds
in the lagoon at high tide, and,
g the summer months, migratory
can be observed from the hide.

l by the turqoise waters of
aloo Reef, a world of colourful fish
oral gardens opens up to those
snorkelling or SCUBA gear.
ɔment hire and diving excursions
e arranged in Coral Bay or
ɔuth. For those who prefer dry feet ,
bottomed boats operate out of
l Bay and at Bundegi Reef near to
ɔuth.

nost popular, passive pursuit in the
is fishing. Angling from the beach
ore rocks is usually productive, but
enthusiastic fishers in the park use
l boats launched from the shore.

ɛational fishing in the park is subject
ɛ Amateur Fishing Regulations and
: are bag and size limits which
ld be followed. Also, check the
ions of Sanctuary Zones, where
ng is not permitted.





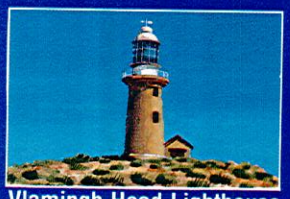
Well Designed - Naturally

For park visitors seeking to learn more about the land and marine environments, and the plants and animals living there, an information centre has been built at Milyering in Cape Range National Park. It is called the Bicentennial Visitor Centre in recognition of the funding received from the Australian Bicentennial Authority.

The Visitor Centre serves as a focus for a wide range of interesting activity programmes. There you can find information about the parks and their wildlife, and directions for the nature trails developed throughout the parks.

The building is designed and constructed to provide comfortable living and working conditions in the arid environment and harsh climate of the north-west. A policy of energy conservation was adopted in constructing the centre and many features have been incorporated to ensure there is minimal impact on the environment from the building and occupants.

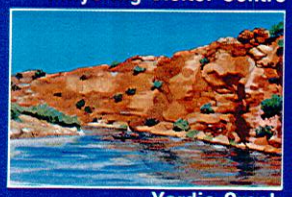
Natural lighting and ventilation are used wherever possible, and solar panels and storage batteries provide power. The thick, rammed earth walls reduce the fluctuations between night and day temperatures in the building, and the deep verandahs ensure shade even at midday. Water is a precious commodity in the north, so composting toilets mean no flushing. The toilets also provide a safe rich fertiliser for the garden, which is watered by runoff from bitumised areas at the centre. Truly a house of the future.



Vlamingh Head Lighthouse

Mangrove Bay Bird Hide

Milyering Visitor Centre

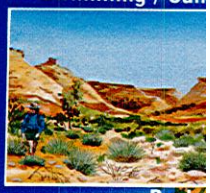


Yardie Creek

Boat Fishing

Scuba / Snorkel Diving

Swimming / Sun



Bushw

Coral V

Exmouth

Mangrove Bay

Milyering

CAPE RANGE NATIONAL PARK

Learmonth

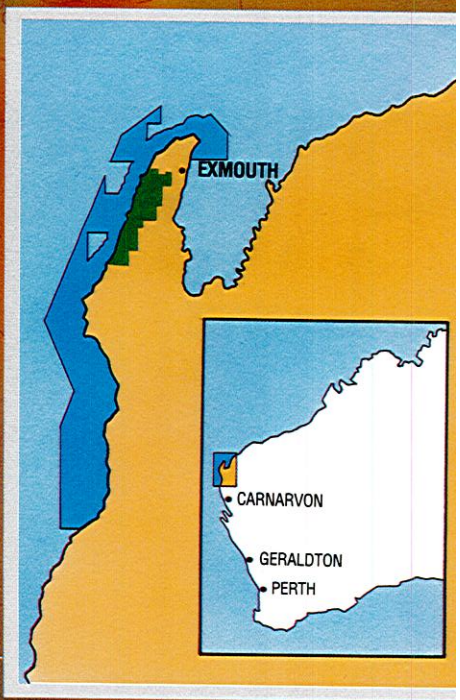
Yardie Creek

INDIAN OCEAN

NINGALOO MARINE PARK

Coral Bay

Tropic of Capricorn



Parks of the North West Cape