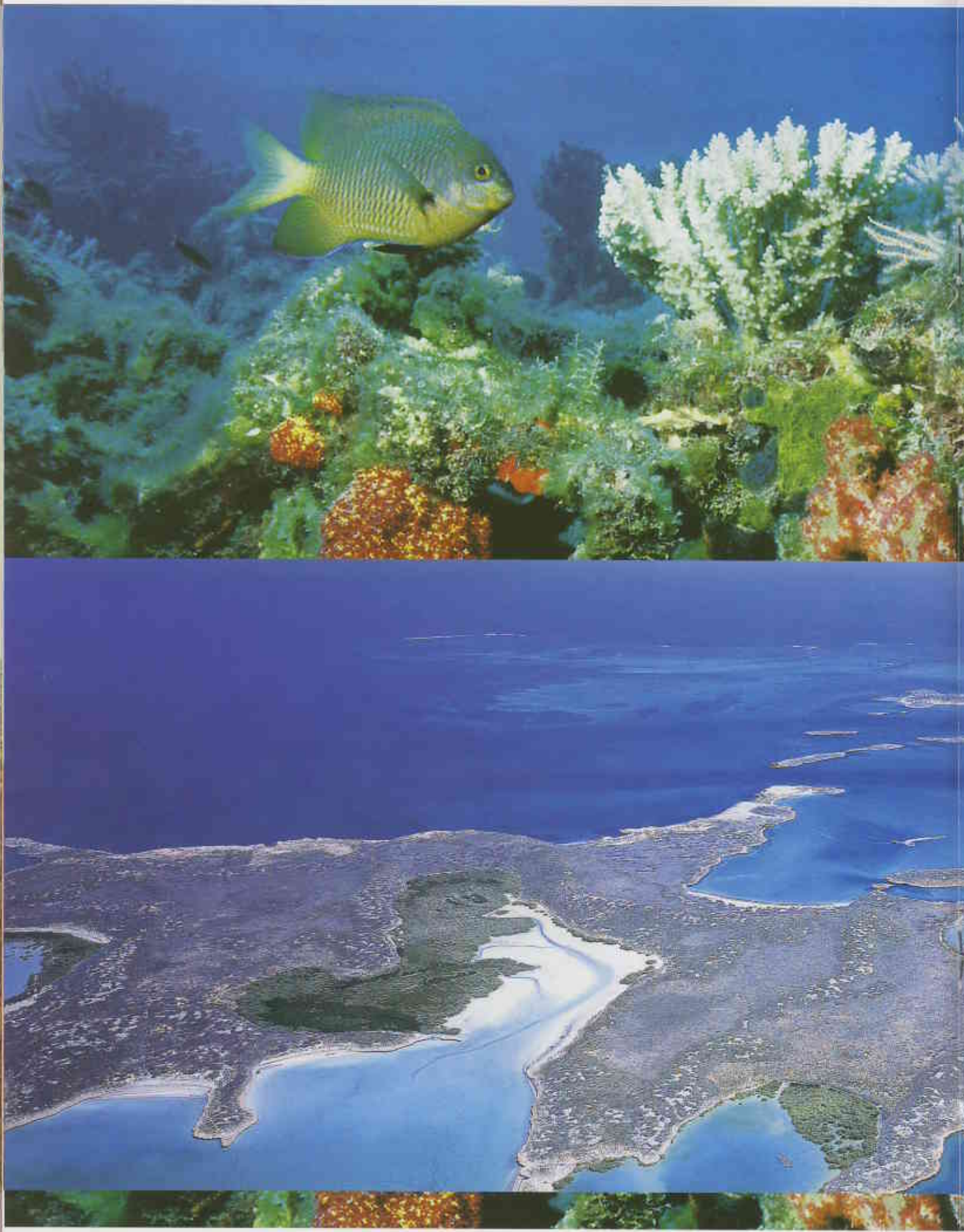
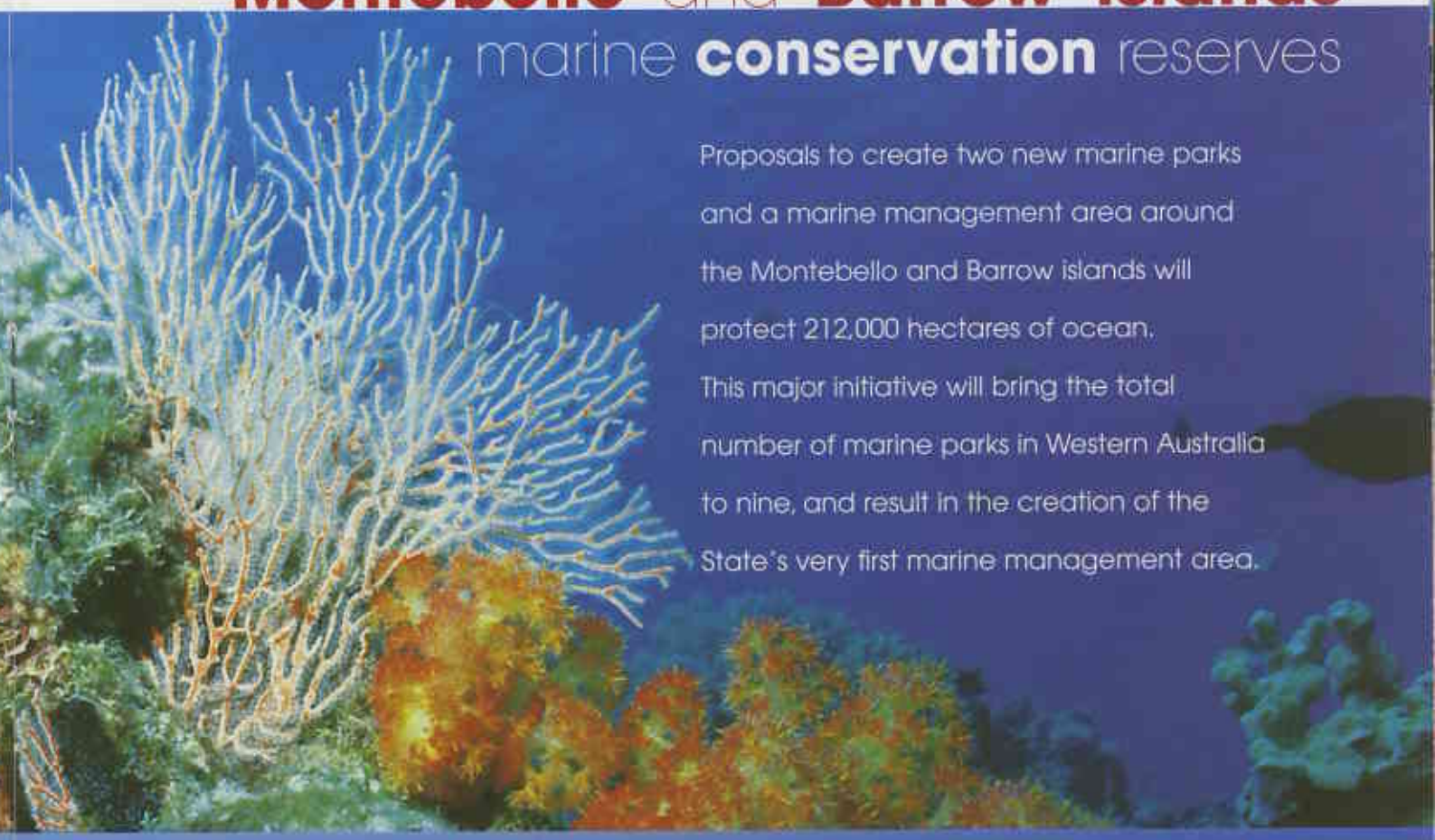


Montebello and Barrow islands marine conservation reserves



Proposals to create two new marine parks and a marine management area around the Montebello and Barrow islands will protect 212,000 hectares of ocean. This major initiative will bring the total number of marine parks in Western Australia to nine, and result in the creation of the State's very first marine management area.

by Andrew Hill and Carolyn Thomson-Dans

Picture islands with beautiful beaches, bays and lagoons fringed by mangroves in places, and surrounded by luxuriant gardens of corals and colourful tropical fish. The Montebello and Barrow islands are surrounded by one of the most beautiful and important marine environments anywhere along the Western Australian coast. Unique offshore mangroves and pristine coral reefs make the area nationally significant. The waters are a haven for large marine animals such as humpback whales, dugongs and several species of marine turtles, and the islands are important stopover areas for rare and protected migratory shorebirds. Barrow Island—the second largest island in WA and an operating oilfield worth millions to the WA economy—is one of the most important nature conservation areas in the State.

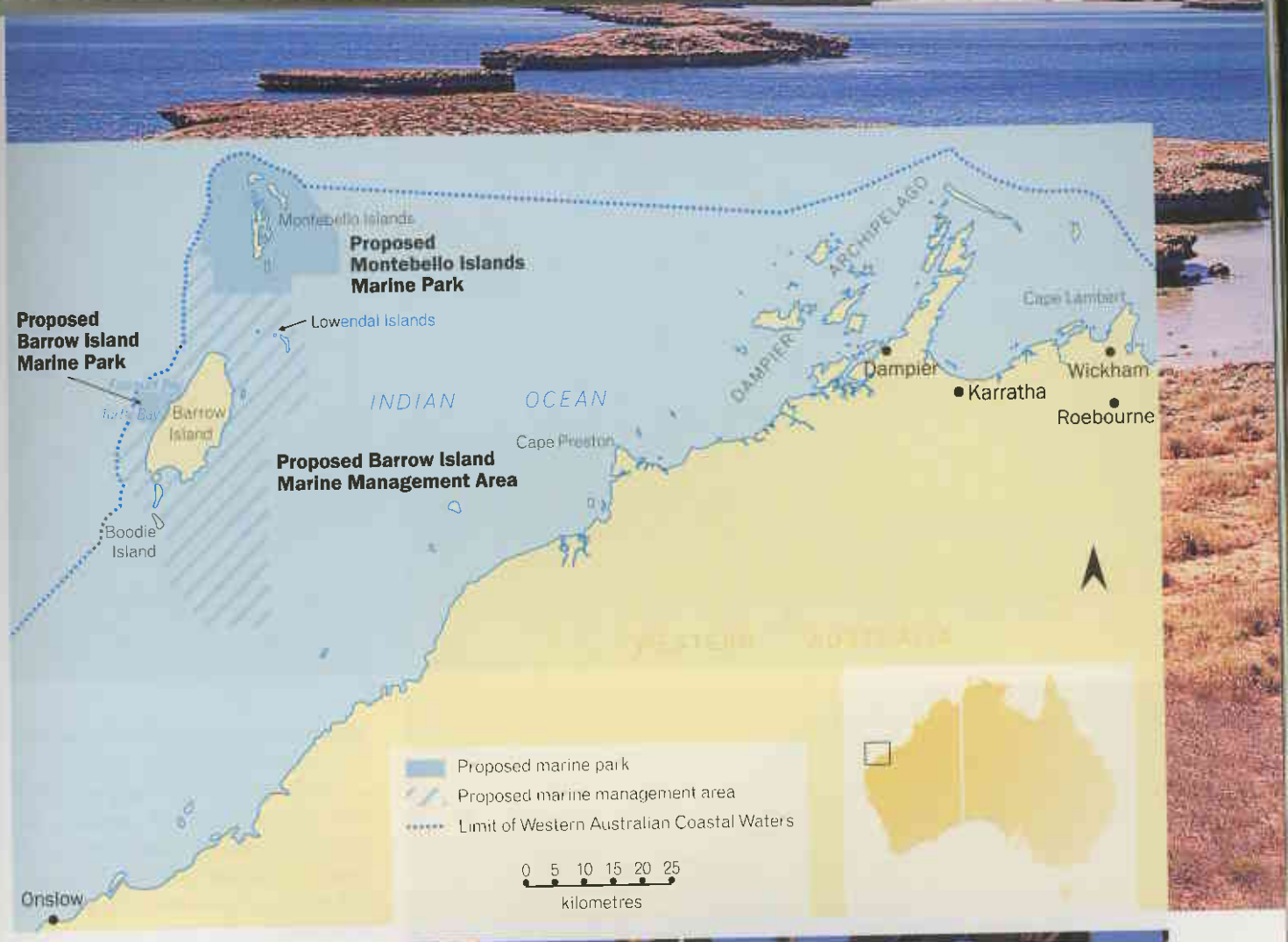
The waters surrounding the Montebello and Barrow islands are to be incorporated into three proposed marine conservation reserves. An indicative management plan for the proposed Montebello Islands and Barrow Island marine parks and the proposed Barrow Island Marine Management Area was released for public comment earlier this year. When the proposal goes ahead, management will aim to protect the area's high conservation values while providing for sustainable use in an area of intense commercial use and increasing recreational use.

The waters around the Montebello and Barrow islands are extremely important for gas and petroleum production and other activities, including nature-based tourism, pearling, recreational fishing and commercial fishing. The development of the indicative management plan for the proposed reserves relied on extensive involvement from stakeholders and the community. A crucial part of the proposal has been the involvement of a community-based advisory committee, which considered community issues and helped to develop the boundaries, purpose and zoning of the proposed reserves. The major interest groups, representing the gas and petroleum industry, commercial fishing, tourism, pearling, recreational fishing and conservation, participated via sector reference groups. A government and industry working group was also set up

Previous page
Top Hard, soft and gorgonian corals at Barrow Island.
Photo – Peter & Margy Nicholas/ Lochman Transparencies
Bottom Aerial view of Montebello Islands.
Photo – Col Roberts/Lochman Transparencies

Above A *LANDSCOPE* Expeditions research vessel passes an oil rig and tender.
Photo – Kevin Kenneally

Left Biodiversity in a lagoon at the Montebello Islands.
Photo – Eva Boogaard/Lochman Transparencies



specially to address regulatory issues concerning petroleum industry access and use, and to help set ecological management targets.

Explosive history

The Montebello Islands have a long history of European contact, which began with the wreck of an English East India Company vessel, the *Tryal*, on the Tryal Rocks (outside the proposed reserves) in 1622—one of Australia's first recorded shipwrecks. The 46 survivors from the wreck were the first recorded Europeans to land on the Montebello Islands.

The natural resources of the proposed reserves have been extracted for many years. American and British whalers are believed to have worked in the region in the late 1800s, while turtles were hunted from the late 1870s until 1973, when concern at the decline of the green turtle led to the licences being cancelled. Cultured pearl farming in the waters surrounding the Montebello Islands began in 1902 and continues today. Commercial fishing, although not extensive in the proposed reserves, also occurs in the area. Oil was discovered on Barrow Island in 1964, and the ChevronTexaco operation now accounts for 34 per cent of the State's oil production. The surrounding waters are also important, with the more recently developed Apache-operated fields near the Lowendal Islands now producing six per cent of the State's oil, and 25 per cent of the State's domestic gas.

Above View of the Montebello Islands seen through ruins of the control centre for nuclear bomb tests.
Photo – Kevin Coate

The Montebello Islands are infamous for the three British nuclear weapons tests that were carried out there in 1952 and 1956. The 1952 test, called Operation Hurricane, saw a 25-kiloton bomb exploded inside the hull of the HMS *Plym*, a frigate anchored in 12 metres of water, 366 metres off Trimouille Island. The explosion left a saucer-shaped crater—six metres deep and 305 metres across—on the sea floor. Testing carried out for Operation Mosaic in 1956 saw a 15-kiloton device exploded on Trimouille Island and a 98-kiloton bomb exploded on Alpha Island—the largest nuclear weapon ever tested on Australian soil. Remains of the associated military activities including scrap metal, disused roads and

the foundations of former British military operational headquarters can still be found on some islands.

Plants and animals

The pristine waters surrounding the Montebello and Barrow islands support a diverse range of marine habitats, including rocky shores, intertidal limestone platforms, beaches, intertidal mudflats, coral reefs, seaweed and seagrass meadows, and mangrove communities.

Six species of mangroves are found in the proposed reserves, usually in narrow fringing strips along bays. They are the white mangrove (*Avicennia marina*), ribbed-fruit orange mangrove (*Bruguiera exaristata*), yellow-leaf spurred mangrove (*Ceriops tagal*), red mangrove (*Rhizophora stylosa*), club mangrove (*Aegialitis annulata*) and river mangrove (*Aegiceras corniculatum*). The mangrove communities are scientifically very important, as it is unusual to find mangroves growing within lagoons on offshore islands.

High diversities of marine animals have been recorded within the Montebello/Barrow islands region. A total of 456 fish species from 75 families, 635 species of molluscs, 170 species of echinoderms (sea stars, sea cucumbers and sea urchins) and 150 species of corals were recorded from the area during a 1993 WA Museum survey. The diversity of fish and mollusc species is similar to the number of species recorded in the Ningaloo Marine Park, and the diversity of some faunal groups such as echinoderms is significantly higher than at Ningaloo. While most of the species have relatively wide distributions throughout the Indo-Pacific region, two of the pipefish species—the multibanded pipefish (*Doryrhamphus multiannulatis*) and Belcher's pipefish (*Phoxocampus belcheri*) —were new records for Australia. As the amount of research in the area increases,

Above left White mangrove (Avicennia marina) showing the pencil-like breathing roots (pneumatophores).

Above CALM researcher Kevin Kenneally and Daphne Edinger with seaweed collections from the Montebello Islands. *Photos – Kevin Kenneally*

Left Hermite Island in the Montebello Islands group.
Photo – David Bettini

it is likely that the number of species recorded will also increase.

The tropical waters of the Leeuwin Current flow south along the WA coast from the North West Shelf to the Great Australian Bight and transport larvae of tropical species to temperate latitudes. The waters adjacent to the Montebello and Barrow islands are considered to be the headwaters of the Leeuwin Current, and may be an important source of recruitment for tropical species down the west coast.

Turtles

Five of the six species of marine turtles found in WA inhabit the proposed reserves. Green, hawksbill and flatback turtles regularly use some of the sandy beaches for breeding, while loggerhead and leatherback turtles use the waters of the proposed reserves. WA's hawksbill turtle population is the only large population of the species remaining in the Indian Ocean, while flatback turtles only breed in Australia. A large population of green turtles nest in the proposed reserves, and the proposed reserves are at the northernmost breeding limit for loggerheads in WA.

Lights and flares from pearling and hydrocarbon industry operations have the potential to impact on turtle hatchlings in the proposed reserves during hatching times. Turtle hatchlings use the lighter horizon over the ocean to orientate themselves to head out to sea. Research by PhD student Kellie Pendoley has shown that lights and flares from industry may attract the hatchlings, disorientating them and making them vulnerable to attack from predators such as seagulls, which are also attracted to the lights (see 'Playing tag with turtles', *LANDSCOPE*, Summer 2003–04).

Top Turtle Bay on Barrow Island.
Photo – Marie Lochman

Above A female green turtle returns to the ocean after laying eggs.
Photo – Alex Steffe

This is being addressed by the pearling and petroleum industries by using special lights, and minimising the use of lights, particularly during peak hatching periods. The indicative management plan for the proposed reserves includes strategies to protect turtles.

Marine mammals

Whales and dolphins recorded in the waters of the Montebello and Barrow islands include the minke whale, Bryde's whale, humpback whale, sperm whale, short-finned pilot whale, killer whale, false killer whale, common dolphin, striped dolphin and bottlenose dolphin. Humpback whales pass through the proposed reserves during their annual migration north to the warm tropical waters off the Pilbara and Kimberley coasts in June and July to give birth and suckle their young. An area of sheltered water west of Trimouille Island, in the Montebello group, is used by female humpback whales and their young calves to rest during their southerly migration to summer feeding grounds in Antarctica.

The dugong is found throughout the tropical and subtropical Indo-West

Pacific, but has been reduced to relict populations separated by large areas in which it is extinct or close to extinction. Dugongs are frequently seen in the shallow, warm waters in the vicinity of the Montebello Islands, Lowendal Islands and Barrow Shoals, though not in the comparatively large concentrations seen further south in Exmouth Gulf or Shark Bay. Current knowledge of the size, distribution and migratory habits of dugong populations in the region is limited. A survey by Department of Conservation and Land Management researcher Bob Prince in 2001 estimated a Pilbara population of approximately 2,000 individuals. The seagrass beds around the Lowendal Islands are thought to provide a valuable food source for these animals and marine turtles.

Reserve proposals

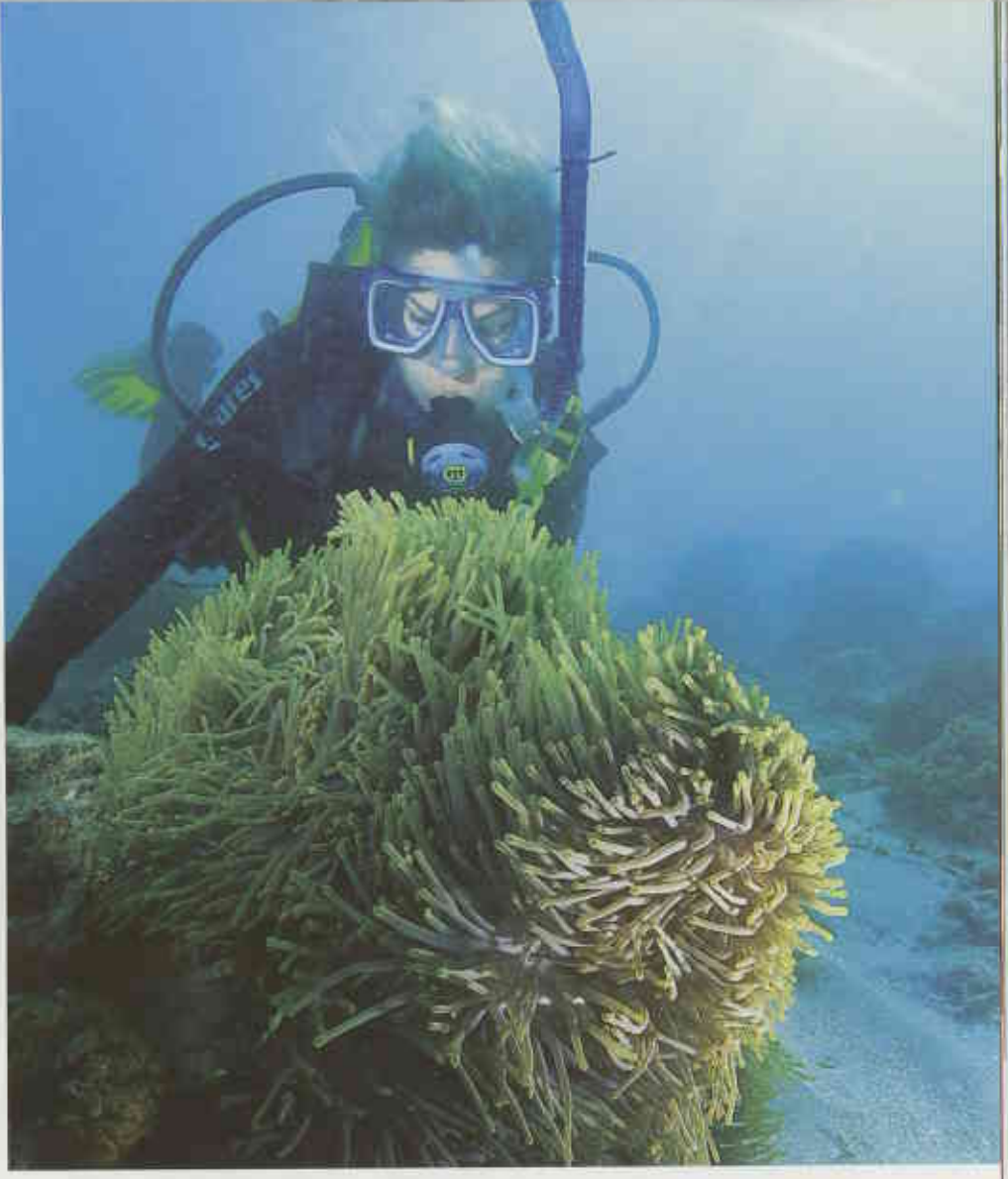
The Montebello Islands Marine Park has been proposed to protect 59,000 hectares of water surrounding the 265 distinct, low-lying islands and islets composed of limestone and cross-

Top Humpback whales.

Centre left Dugong mother and calf.
Photos – Geoff Taylor/Lochman Transparencies

Left A feather star on sponge at the Montebello Islands.
Photo – Peter & Margy Nicholas/ Lochman Transparencies

Above Recreational fishing at the Montebello Islands.
Photo – Kevin Coate



Right The Montebello Islands are becoming increasingly popular for diving.
Photo – Peter & Margy Nicholas/ Lochman Transparencies

bedded sandstone. The islands are generally very irregular, with convoluted coastlines, and are surrounded by lagoons, channels, intertidal embayments, barrier and fringing reefs, and shallow limestone platforms exposed to the open ocean. More than half of the marine park (52 per cent) is proposed to be in sanctuary zones.

The proposed Barrow Island Marine Park, covering Biggada Reef on the western side of the island adjacent to Turtle Bay and Flacourt Bay, will protect 4,500 hectares of water, of which about 94 per cent will be in sanctuary zones. Biggada Reef is one of two examples of significant fringing reef that occur in the proposed reserves. Turtle Bay is a significant nesting area for green turtles. Hawksbill and flatback turtles also occasionally nest in the bay.

The proposed Barrow Island Marine Management Area will cover 148,500 hectares of water surrounding Barrow Island and nine smaller islands. A marine management area is an area that has high conservation value, but where industry operations such as petroleum exploration and production are major uses. It is one of three marine reserve categories under the *Conservation and Land Management Act 1984*, along with marine park and marine nature reserve. The proposed marine management area will include a conservation area at Barrow Shoals, incorporating a large area of leeward coral reef communities. Similar to a sanctuary zone of a marine park, most extractive activities will be excluded from this conservation area. A smaller conservation area will also be located at Bandicoot Bay, which provides important feeding grounds for migratory birds. The majority of the marine management area will not be specifically zoned. This unzoned area (proposed to be 86 per cent of the overall area) will provide for recreational and commercial activities to occur, providing that they are compatible with the overall maintenance of the reserve's values.

The proposal to establish the three new marine reserves at the Montebello and Barrow islands is a significant step forward in the State Government's program to expand the existing system of marine parks and reserves in Western Australia (see 'Vision Splendid', *LANDSCOPE*, Winter 2003) and will form a milestone on the road to creating a world-class conservation reserve system in the State's marine environment.

Andrew Hill is Senior Marine Planning Officer for CALM's Marine Conservation Branch and is responsible for coordinating the planning and establishment of new marine conservation reserves.

Carolyn Thomson-Dans is a long-time writer and editor for *LANDSCOPE*, with a special interest in the marine environment.

The authors would like to acknowledge input by CALM Executive Director Keiran McNamara, Manager of CALM's Marine Conservation Branch Chris Simpson and the assistance of Russell Lagdon of ChevronTexaco and turtle researcher Kellie Pendoley.

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Regulars

Erratum

The photograph in the Autumn 2004 issue of *LANDSCOPE* (mid left, page 52) is the rare *Diuris purdiei* not *Diuris corymbosa* as stated in the caption.

The photograph in the Summer 2003-04 issue of a snail on p. 56 and p. 61 was incorrectly captioned. The photo is of the introduced predatory snail *Oxychilus* sp., which is thought to be at least partly responsible for the extinction of the Pemberton and Albany snails, and is a threat to many of our native terrestrial snails.

Publishing credits
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Phone (08) 9334 0481 or (08) 9334 0437
Prepress Advance Press
Printing Advance Press, Western Australia
© ISSN 0815-4465

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Published by the Department of Conservation and Land Management, 17 Dick Perry Avenue, Kensington, Western Australia.