A secret world of weird and wonderful animals, many previously unknown to science, is only just beginning to be discovered beneath the surface of the waters of the Dampier Archipelago. This unique area is being considered for reservation as a marine conservation reserve.

by Diana S Jones

Dampier Archipelago down under

The Dampier Archipelago lies within a 45-kilometre radius of the town of Dampier. Situated at the eastern end of an extensive chain of small coastal islands between Exmouth and Dampier, it is one of the major physical features of the Pilbara coast.

The 42 islands, islets and rocks within the archipelago became remnant dry land when sea levels fell 6,000 to 8,000 years ago. The small outer islands, such as Millers Rock and Nelson Rock, and the larger islands in the north of the archipelago, such as Kendrew, Brigadier, Legendre and Delambre, are composed of limestone—formed in the last million years during the Pleistocene or Holocene epochs—with fringing intertidal platforms and coral reefs. These islands, around the seaward margin of the archipelago, are consolidated remnants of coastal dune systems from times of lower sea levels.

The inner islands and the Burrup Peninsula consist of ancient Archaean and Proterozoic igneous rocks, overlain in places by more recent sandy limestones, together with varying thicknesses of sand and/or gravel and mud. Amazingly, many of the present-day coral reefs of the Dampier Archipelago consist of a living veneer of corals on relic Pleistocene reefs. These inner islands resemble the hills of the adjacent mainland. Most are steep, rugged and sparsely vegetated, with coastal cliffs and steep piles of rocks separated by valleys, beaches and coastal sandplains.

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Main Burrup Peninsula and Nickol Bay.
Photo – David Bettini
Insets from left A spectacular feather star secures a foothold on coral; measuring and recording Western Australia's marine biodiversity.
Photos – Clay Bryce/WA Museum

Left Pearl and pearl crab (*Pinnotheres* sp.) inside an oyster shell.
Photo – Jiri Lochman

Below left Dolphin Island.
Photo – David Bettini

Use of the area

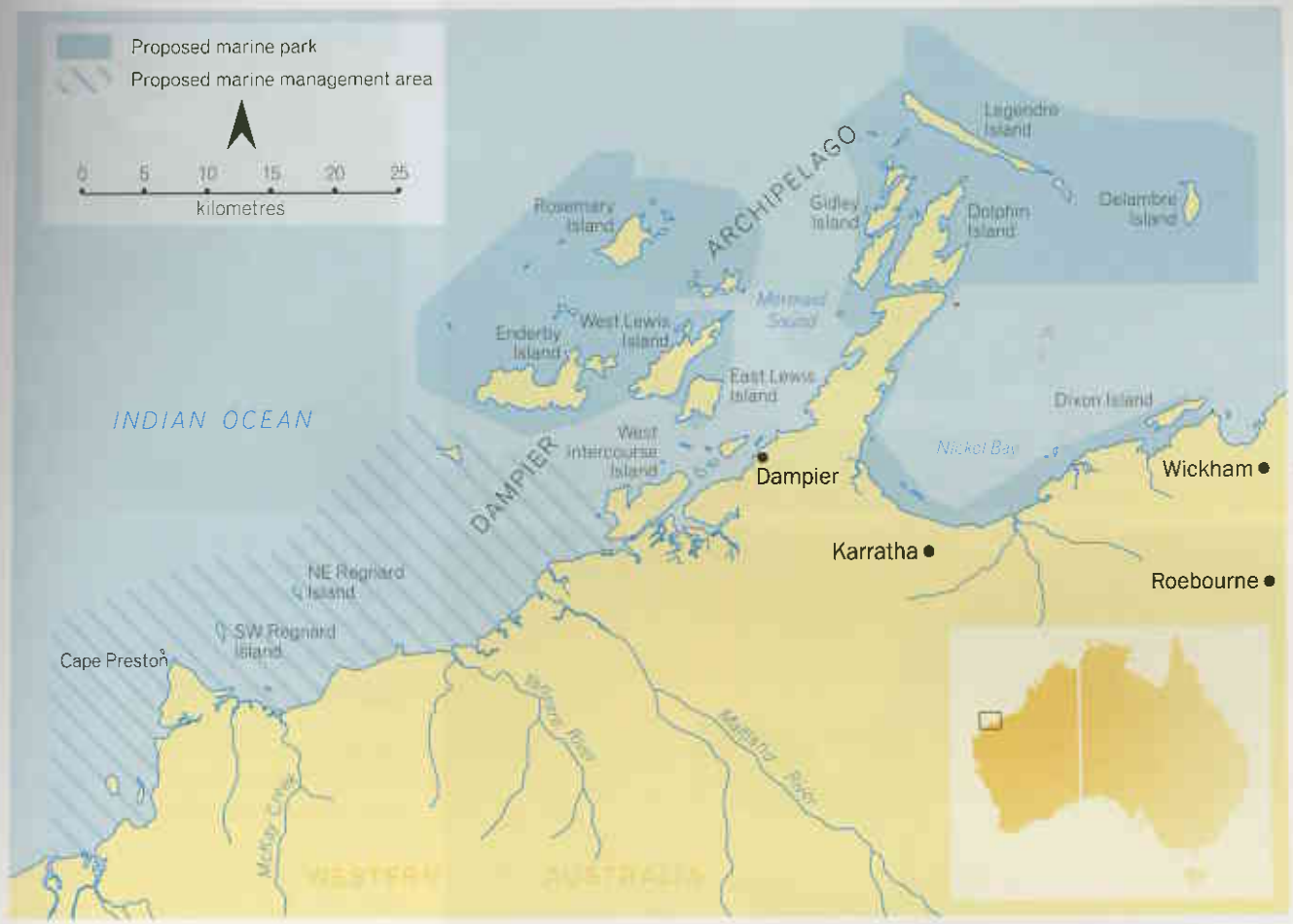
Shell middens, stone 'factory' sites and rock art throughout the islands show that they have been used extensively by Aboriginal people, long before rising sea levels isolated coastal plains and hills to create the present-day archipelago. Together with the Burrup Peninsula, the archipelago is one of the richest sites for prehistoric rock engravings in the world, with more than 10,000 Aboriginal engravings in more than 500 recorded sites. Local Aboriginal communities continue to hunt and fish in the region.

An intriguing Dutch East India Company chart of 1628 shows the Dampier Archipelago, but Englishman William Dampier made the first recorded European visit aboard the *Cygnet* in 1688. He returned in 1699 on the *Roebuck*, anchoring off Enderby Island on 31 August. On 1 September, Dampier landed on an island that he named 'Rosemary' due to the presence of a plant that reminded him of that herb.

French navigator St Allouarn noted 'Rosemary Island' while sailing from North West Cape to Timor in 1722, but did not land. In 1801, Nicolas Baudin's expedition on the *Géographe* named the group of islands Dampier's Archipelago and named a number of the islands after renowned French scientists and academics (such as Malus, Legendre and Delambre). Baudin's navigator assigned Dampier's name of 'Rosemary' to an island a few kilometres north-west of Malus Island. However, research has shown that Dampier's 'Rosemary' was almost certainly East Lewis Island.

In 1818, Lieutenant Philip Parker King on the *Mermaid* made a more detailed survey of the archipelago, naming Enderby, Gidley, Lewis and the Intercourse islands and Nickol Bay. In 1851, Lieutenant Helpman noted "Numerous fresh native footmarks on the beach" and three graves, believed to be of early whalers, on Enderby Island.

The first Europeans to explore the inland Pilbara arrived on the *Dolphin*, under the leadership of Surveyor F T Gregory in 1861. They landed at



Right Salt loading at Mistaken Island.
Photo – David Bettini

Hearson Cove on the Burrup Peninsula in May 1861, and named Dolphin Island after their ship.

From an industrial point of view, the Burrup Peninsula is one of the most strategically important pieces of land in Australia. Salt, iron-ore and liquefied natural gas shipping facilities, salt evaporators and associated plant centred on Mermaid Sound and the lower Burrup Peninsula are of major economic importance. The area is also rich in offshore oil and gas and, for the past 30 to 40 years, exploration and production activities have been conducted around the Dampier Archipelago.

Dampier lies on what was once an island, separated from the mainland by mangroves and high tidal salt flats, and is now joined to the mainland by a causeway. Mistaken, East Mid Intercourse and East Intercourse islands have also been joined by a causeway to the mainland. Dampier—Australia's largest tonnage port, responsible for 20 per cent of the State's annual export revenue—is the port for the inland iron-ore mining operations at Tom Price and Paraburdoo. Nearby Karratha is a thriving business centre and has gained even more momentum through the development of the immense offshore gas reserves by Woodside Energy's North West Shelf Gas Project. Further major expansions worth billions of dollars are planned in the Dampier-Burrup-Karratha area, and additional shipping channels and berth access will be needed for these projects.

The Dampier Archipelago and its adjacent waters have been commercially fished since the late 1800s for pearlshells, turtles, tuna and whales. In 1861, Gregory noted that pearlshells were abundant in the Dampier Archipelago. Flying Foam Passage was the major pearling area in the north-west between 1870 and 1900. From 1870 to 1872, a whaling station was established on Malus Island to process humpback whales taken by longboats operating around the

Above Grey mangroves with air-breathing roots exposed during low tide.
Photo – Marie Lochman

Above left Nesting brown booby.

Left A female green turtle returns to the ocean after egg laying.
Photos – Alex Steffe/Lochman Transparencies

Dampier Archipelago. Today, norwest snapper, sea perch, threadfin bream and groper are commercially fished here. One of WA's smaller prawn trawl fisheries, for the banana prawn, is based in Nickol Bay, and a cultured pearling industry now flourishes in the area.

Conservation values

The Dampier Archipelago is an area of exceptional natural beauty, abundant natural diversity and significant Aboriginal and European cultural values. There are extensive local recreational fishing, diving and shell collecting activities. Charter boats cater for visitors and the archipelago could potentially attract increasing numbers of tourists. Significant Aboriginal rock art sites occur on many of the rock-pile islands, as well as on the Burrup Peninsula. Some islands support the only remaining populations of plants and animals that have disappeared from the mainland and, thus, have very high conservation values. Several of the beaches are important nesting sites for hawksbill, flatback and green turtles. More than 40 species of shorebirds and migratory waders use the saltmarshes, mangroves, extensive mudflats and intertidal reefs, and some of the small, outer islands and rocks support large seabird colonies.

There are about 70 species of whales and dolphins in the world's oceans, and 36 are known to visit Western Australia's subtropical and tropical waters. Of these, four baleen and eight toothed whale (including five dolphin) species have been recorded within the archipelago, but it is likely that all 36 Indian Ocean species occasionally visit the area.

The archipelago's diverse geology, geomorphology, tidal regime (large tides of up to 6.3 metres bathe the islands) and exposure to currents and waves supports a large number of different marine habitats. These habitats support numerous marine organisms such as fish, shellfish, crustaceans, corals, sponges, sea stars, sea urchins and other invertebrates.

The Dampier Archipelago Islands Management Plan (1990) contained a recommendation that the waters of the archipelago should be considered for reservation as a marine park. In 1994, the Marine Parks and Reserves Selection Working Group Report recommended that the waters of the Dampier Archipelago, excluding the inner portion of Mermaid Sound and the functional area of the port, should be considered as a reserve. Currently, the Cape Preston to Dampier Archipelago region has been identified for proposed marine reserve status and the proposed Dampier Archipelago-Cape Preston marine conservation reserve will hopefully be established by 2005.

New research

The Dampier Archipelago is a key component of the nearshore marine ecosystems of the North West Shelf. While they were known to be diverse, the marine plants and animals of the archipelago had never been documented in detail. In 1998, Woodside Energy and the Western

Australian Museum came together in an ambitious, multi-year partnership to explore the marine environment of this area. An innovative, multi-partner approach resulted in more than 60 scientists from 15 countries cooperating with nine scientists from the WA Museum and staff from Woodside's environmental teams. Four Australian and four international museums, 23 Australian universities, research institutions and schools, 27 international universities and research institutions and 19 local and Australian companies, including the Department of Conservation and Land Management and other government departments, the local Shire, marine research institutions and other resource companies in the Dampier area, have participated in the project.

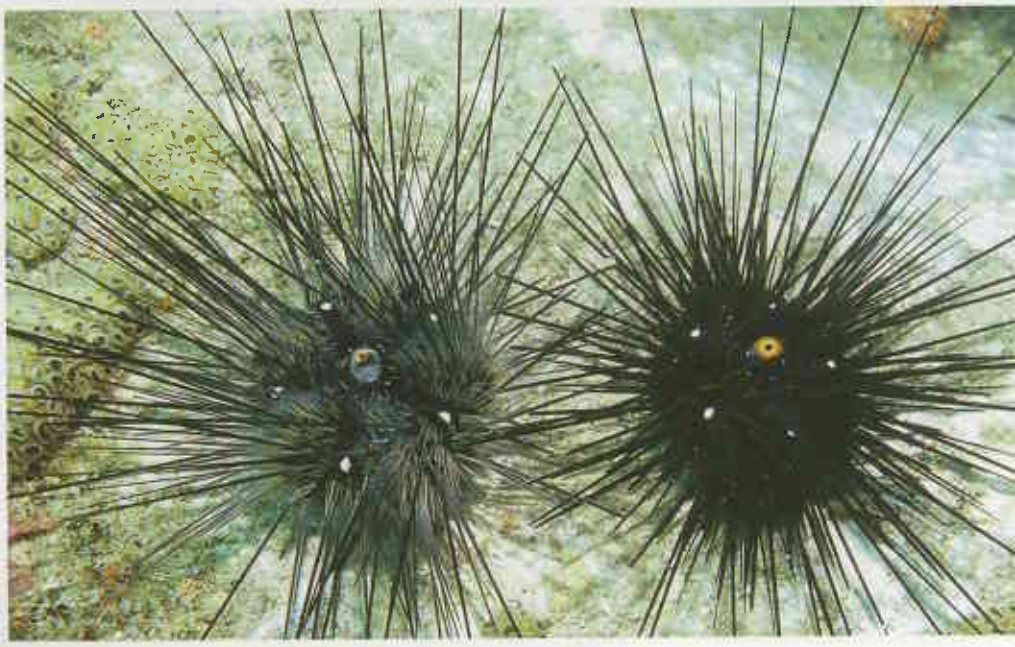
The partnership presented an unprecedented opportunity to create 'The Woodside Collection', a perpetual record of the biodiversity of the area. Two diving expeditions, a dredging and trawling expedition and the first international marine biological workshop to be held on the north coast of Western Australia collected reference specimens. The information generated will be made readily accessible to a worldwide audience through an interactive website.

Currently, The Woodside Collection houses specimens representative of more than 3,200 species—182 species of marine algae, 275 species of sponges, 229 coral species, 498 different crustaceans, 286 species of echinoderms (sea stars, urchins and sea cucumbers), 1,227 molluscs and 650 species of fish. This makes the Dampier Archipelago the richest area of marine biodiversity known in WA, with a biodiversity comparable with that of northern Queensland. For example, 438 crustacean species were collected during the diving and dredging expeditions, bringing the total known from the area to 543. Of these, 120 species are new records for the archipelago, 82 are new records for WA, five are new records for Australia and six are new species to science.

With a total of 229 hard coral species, the archipelago is now placed second only to Ashmore Reef in terms of the number of hard coral species for a WA region. Thirty-nine new records were recorded in the archipelago.

Sea stars and sponges

Remarkable numbers of echinoderms occur in the Dampier Archipelago. There are 286 species, the highest number recorded from any part of WA. This rich fauna is a reflection of the diversity of habitats and the range of exposure to wave action, turbidity and currents related to the complex topography of the archipelago. There are major habitat differences between the eastern and western parts of the archipelago, with more areas of soft sea floors in the western part. This is reflected in the considerable differences in the echinoderm fauna, with more species recorded in the western (139 species) than the eastern (115 species) parts of the archipelago. There are strong currents in the channels between islands, and areas such as off the south-west corner of Enderby Island are particularly rich. The richest dredge



Top right Reference specimens for 'The Woodside Collection' collected during the diving expeditions were carefully sorted, documented and preserved by scientists.
Photo – Clay Bryce/WA Museum

Right The needle-spined urchin (*Diadema setosum*).
Photo – Clay Bryce/Lochman Transparencies

Left The beautiful and diverse sponge gardens of the waters of the Dampier Archipelago

Below left A translucent prawn is well camouflaged from its predators.
Photos – Clay Bryce/WA Museum

sites were north of Legendre and Delambre islands.

The first significant collection of sponges ever made from the archipelago increased the number known there from 14 to 275 species, many of which were new. Sponges were recorded in large numbers from channels and straits and off islands in areas where there was good current flow. Throughout the archipelago, a fine-scale mosaic of species-rich and species-poor areas is apparent. Wonderfully rich sponge gardens in these waters act as 'hotels' for a wide variety of other animals. A great diversity of molluscs occurs in the archipelago, including the largest marine snail, the giant conch (*Syrinx aruanus*), and one of the rarest bivalve molluscs in the world, the watering pot shell (*Brechites vaginiferus australis*).

Exhibitions and more

Exhibitions have been opened at the WA Museum in Perth and at the Woodside Visitors' Centre on Burrup Peninsula. An educational video, *Our Backyard*, was produced with the support of the Department of Education, the Curriculum Council of Western Australia and the two high schools in the region. The documentary, *Life on the Edge – Down Under*—so far distributed to eight countries and viewed by more than 40 million people—was screened recently on television throughout regional WA.

A dedicated website, radio interviews, articles in magazines and newspapers, and talks and lectures by scientists have also publicised the project widely. The WA Museum has recently produced a major scientific report on the findings and a further two reports will be published in 2004.

In 2001, the achievements of the WA Museum-Woodside Energy partnership were recognised through the award of a Golden Gecko for environmental excellence. The awards, coordinated by the Department of Mineral and Petroleum Resources, promote and encourage advances in environmental management and rehabilitation in the mining and petroleum industries. In August 2003, the partnership also won the prestigious City of Sydney Open Award in the Australian Business Arts Partnership (AbaF) Awards, which honours exceptional partnerships between business and arts organisations that have demonstrated vision, leadership and commitment to developing alliances between the arts and business.

But, more importantly, the Woodside-WA Museum partnership is providing unique baseline information on the marine biodiversity of the Dampier Archipelago that will facilitate sound environmental management to maintain this biodiversity for future generations.

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Our Backyard and *Life on the Edge – Down Under* are available through the Western Australian Museum Bookshop. Email: bookshop@museum.wa.gov.au

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