

Marine Conservation Matters

A Newsletter about Marine Conservation in The Department of Conservation and Land Management

November 2001

FOOD FOR THOUGHT

MARINE PROTECTED AREAS —A LONG-TERM VIEW

At a recent workshop, the Chairman of the Marine Parks and Reserves Authority, Dr Barry Wilson, outlined the history of the program to create a statewide system of marine protected areas (MPAs) in Western Australia. In the 1960s, Dr Wilson and other prominent marine scientists, such as Dr Graham Chittleborough and the late Dr Ernest Hodgkin, identified a number of areas around Western Australia they considered worthy of marine reservation. These areas were subsequently recommended for marine reservation by the Australian Marine Sciences Association (AMSA) in Western Australia.

The AMSA recommendations of the 1960s were adopted by the Conservation Through Reserves Committee (CTRC) report in the early 1970s. Although aquatic reserves could only be created under existing fisheries legislation during this period, none was established. By the early 1980s it was clear that new 'conservation' legislation was needed if the goal of creating a statewide system of marine reserves was to be achieved. The Conservation and Land Management Act came into effect in 1985 and contained the necessary marine reserve provisions. Between 1985 and 1990, seven marine conservation reserves were established covering more than one million hectares of the State's coastal waters. These were based largely on the original AMSA recommendations.

In the early 1990s, some sectors increased concerns about the establishment of MPAs. As a result no further marine reserves have been created in Western Australia since 1990. Following the release of the report of the Marine Parks and Reserves Selection Working Group in 1994, it became clear that changes in Government policy and to the marine reserve provisions of the Conservation and Land Management Act were needed to help overcome these concerns. Appropriate legislative changes came into effect in August 1997 and included the creation of the Marine Parks and Reserves Authority and the Marine Parks and Reserves Scientific Advisory Committee (see previous issues of Marine Conservation Matters for their roles). The Marine Conservation Branch was established in the Department of Conservation and Land Management in May 1996. Since these changes, the MPA program in Western Australia has been gathering momentum and marine reserve declarations are expected to increase significantly over the next few years.

Dr Wilson's remarks are a timely reminder that the MPA 'program' in Western Australia is not a modern 'fad' as some suggest, but a long-term program, to protect Western Australia's rich marine biodiversity dating back to the 1960s. It also reminds those of us who are currently involved to keep the 'vision' of those early conservationists clearly in view, to acknowledge the considerable progress that has been made and not to get too impatient over the rate of progress or discouraged by the difficulties and obstacles that continue to appear 40 years on.

MARINE RESERVE IMPLEMENTATION

Jurien Bay Marine Park

Proposal in the Spotlight

Following the review of public submissions and associated amendments to the *Indicative Management Plan*, final approvals are now being sought to gazette the proposed Jurien Bay Marine Park. This requires the support of the Minister for the Environment and Heritage as well as

that of both the Minister for State Development and the Minister for Fisheries. When the necessary approvals are obtained the marine park will be gazetted.

While the essential process of Government consideration and approval proceeds, the *Jurien Bay Marine Park Indicative Management Plan* has also recently been reviewed at an international level.

Continued on page 2

IMPORTANT NEWS IN THIS ISSUE

- | | | | |
|--|------|----------------------------|-------|
| • Montebello/Barrow Reserve | p. 2 | • Shark Bay Marine Park | p. 7 |
| • Dampier/Cape Preston Marine Conservation Reserve | p. 4 | • Rowley Shoals monitoring | p. 8 |
| • Ningaloo Marine Park | p. 5 | • Eighty Mile Beach survey | p. 12 |
| | | • Turtle Harvesting survey | p. 13 |

MARINE RESERVE IMPLEMENTATION

Jurien Bay Marine Park

Continued from page 1

The Minister for the Environment and Heritage received a letter from the World Conservation Union, or IUCN, which is an international conservation organisation of high renown. The letter explained that staff from the National Commission for Wildlife Conservation and Development and the IUCN have just completed a review of marine protected area management plans from around the world. This was undertaken to identify an optimum model to assist with the establishment of a network of marine protected areas along the Saudi Arabian Red Sea coastline. The *Indicative Management Plan for the Proposed Jurien Bay Marine Park* was unanimously chosen "... as the most logically structured and workable model". Therefore, not only has the structure of the plan been internationally recognised and highly commended by the world's premier conservation organisation, it is also of practical assistance to other countries in developing their own marine protected area programs.

Contact: Andrew Hill, Senior Marine Planner, Marine Conservation Branch.
E-mail: andrewhi@calm.wa.gov.au



The waters of Jurien Bay support valuable commercial and recreational activities.

Proposed Montebello/Barrow Islands Marine Conservation Reserve

The Advisory Committee for the Proposed Montebello/Barrow Islands Marine Conservation Reserve has now met four times. At their meeting in March 2001, the Committee developed zoning options for the proposed marine conservation reserve. Marine Conservation Branch staff subsequently consulted with sector reference groups to facilitate community involvement regarding these zoning options. At their last meeting in August, the Committee considered the feedback and made amendments to the zoning scheme where appropriate.

Proposed Dampier Archipelago/Cape Preston Marine Conservation Reserve

The Advisory Committee for the Proposed Dampier Archipelago/Cape Preston Marine Conservation Reserve has now met five times. At their last two meetings, the Committee considered management targets and pressures on, or threats to, the main ecological values of the area. Management objectives and strategies to address these pressures were also discussed. In addition, the Committee was briefed by staff from the Department of Fisheries regarding the Pilbara Regional Recreational Fishing Strategy and by staff from the Western Australian Museum regarding the results of marine biodiversity surveys undertaken in the Archipelago in 1999 and 2000.

The next major step is the consideration of reserve category(s) and possible zoning options that are most appropriate for the area. The Committee had planned to meet during August. However, this meeting had to be cancelled and will probably be rescheduled in November. Following this meeting, community feedback will be sought from sector reference groups on the proposed zoning options.

This project is partly funded by the Commonwealth Government's Natural Heritage Trust Marine Protected Areas Program.

Contacts:

Andrew Hill, Senior Marine Planner, Marine Conservation Branch.

E-mail: andrewhi@calm.wa.gov.au

Fran Stanley, Reserves Management Officer, Pilbara Region, Karratha.

E-mail: frans@calm.wa.gov.au



Aerial photo of the Burrup Peninsula and islands of the Dampier Archipelago.

Proposed Montebello/Barrow Islands Marine Conservation Reserve

The Advisory Committee for the Proposed Montebello/Barrow Islands Marine Conservation Reserve has now met four times. At their meeting in March 2001, the Committee developed zoning options for the proposed marine conservation reserve. Marine Conservation Branch staff subsequently consulted with sector reference groups to facilitate community involvement regarding these zoning options. At their last meeting in August, the Committee considered the feedback and made amendments to the zoning scheme where appropriate.

The Committee also considered the issue of what reserve category (i.e. marine park, marine nature reserve or marine management area), or combination of categories, would be most appropriate given the balance of ecological and social values and the proposed management approach. Several options were discussed at length and will be considered further following consultation with the Marine Parks and Reserves Authority, key government agencies and sector reference groups. A decision will be finalized at the next meeting in December 2001. At this meeting members will consider the complete reserve proposal in the form of a first draft of the *Indicative Management Plan* for the area.

This project is partly funded by the Commonwealth Government's Natural Heritage Trust Marine Protected Areas Program.

Contacts:

Liesl Jonker, Marine Planning Officer, Marine Conservation Branch.

E-mail: lieslj@calm.wa.gov.au

Contact: Fran Stanley, Reserves Management Officer, Pilbara Region, Karratha.

E-mail: frans@calm.wa.gov.au



Coral communities of the proposed Montebello/Barrow Islands marine conservation reserve.

Review of the Ningaloo Marine Park Management Plan

The management plan for the Ningaloo Marine Park (State Waters) is now more than 10 years old and is being reviewed. The resource assessment, or acquisition of information about the wide range of ecological and social values of the park, and preliminary consultation phases of the planning process are nearing completion. In 1999 a preliminary public consultation program entitled 'Have Your Say' was undertaken to provide the community with the opportunity to comment on the management issues in both the Commonwealth and State areas of the park. The submissions have been analysed to provide an initial summary of the key management issues in the State waters of the park. Background documents outlining current patterns and trends in human usage, the ecological status of the park, marine wildlife distributions and major marine habitats of the area form the basis for the development of a new management plan.

An options paper is being developed which will outline the objectives and strategies addressing the key management issues in the park over the next ten years. The options paper will also include a revised zoning scheme (based on recent habitat mapping) that will ensure the full range of benthic habitats found within the park is adequately represented within sanctuary zones. The options paper will also include consideration of the areas to the north and south of the existing marine park. The study area to the north includes the Muiron Islands and Sunday Island and the area to the south includes the State waters south of the existing park boundary down to Red Bluff. The options paper will be provided to the MPRA for their initial consideration. Following MPRA consideration the options paper will be provided to the Coral Coast Parks Advisory Committee (CCPAC) for their comment and then ultimately to key stakeholder groups. Once the draft plan is finalised it will be released for a three-month public submission period.

Contact: Mat Cork, Marine Planning Officer, Marine Conservation Branch.

E-mail: mathewc@calm.wa.gov.au



A wide range of species are targeted by recreational fishers within Ningaloo Marine Park. Photo courtesy of Sue Osborne



Geographe Bay/ Leeuwin-Naturaliste /Hardy Inlet

Marine Conservation Reserve Proposal

The resource assessment phase of the planning process for a proposed marine conservation reserve in the Geographe Bay/Leeuwin-Naturaliste/Hardy Inlet region is in its final stages. Information gathered from community members and Government agencies in January has been digitized to produce human usage maps of the area. Final verification of this information is currently being sought from key user groups. Local knowledge is also being used to help develop a better understanding of the distribution of marine wildlife in the area as well as the location of key breeding, feeding and resting sites. Department of Conservation and Land Management staff would like to thank everyone who has contributed to this project to date and to encourage members of the community to provide further information to help refine these resource maps.

A call for interested persons to nominate for a community-based planning advisory committee is proposed for early 2002. The advisory committee will have an independent chair and will operate in a non-sectoral manner to seek a planning outcome which benefits all Western Australians (i.e. members will be appointed for their knowledge and expertise and not to represent the interests of particular sectors of the community or stakeholder groups). The advisory committee will assist the Department of Conservation and Land Management in the preparation of an indicative management plan by making recommendations in relation to the type of marine reserve, appropriate boundaries and management strategies including preferred zoning options.

This project is partly funded by the Commonwealth Government's Natural Heritage Trust Marine Protected Areas Program.

Contact: Andrew Hill, Senior Marine Planner, Marine Conservation Branch.

E-mail: andrewhi@calm.wa.gov.au



The proposed Geographe Bay/Leeuwin-Naturaliste/Hardy Inlet marine conservation reserve has high recreational values. Photo courtesy of Bob Rickmans

Public participation

Public participation programs (PPP) in marine conservation reserves requires planning to target audiences with clear messages, and the provision of effective appropriate communication. The PPP for the proposed Geographe Bay/ Leeuwin-Naturaliste /Hardy Inlet marine conservation reserve is designed in stages so that each stage has specific objectives and planned outcomes.

Community Liaison Officer, Neil Taylor, has been busy in the Busselton to Augusta community contacting over 300 people during the last five months. This initial stage of the PPP has targeted community leaders and those most likely to have an interest in a marine conservation reserve proposal in this area. This has included local members of Parliament, local government representatives and staff, local tourist bureau managers, commercial fishers, Aboriginal leaders and local members of the press.

During this initial stage, Neil has primarily used face-to-face discussions to deliver information about the proposed reserve and planning process and to identify the aspirations and concerns of the community.

The next stages of the Geographe Bay/Leeuwin-Naturaliste /Hardy Inlet PPP will involve:

- A survey to help develop a profile of the local community in regard to its:
 - visions and aspirations in relation to marine conservation and management,
 - attitudes towards the marine reserve proposal,
 - levels of knowledge and understanding of the marine reserve concept, planning process and roles of both Government and the community in developing a marine conservation reserve in this area,
 - issues of concern to stakeholder and interest groups, and
 - relationships between and within sectors of the community;
- implementing a broad community education program to assist the local community in understanding how to provide input into the planning of a marine conservation reserve in this area; and
- the establishment of communication links between the planning advisory committee and the community.

Contacts:

Dr Sue Osborne, Community Liaison Officer, Marine Conservation Branch.

E-mail: sueo@calm.wa.gov.au

Neil Taylor, Community Liaison Officer, Blackwood District, Busselton.

E-mail: neilta@calm.wa.gov.au

MARINE RESERVE MANAGEMENT

Current status

Monitoring and survey data from Government and private organisations, human usage patterns and trends as well as anecdotal information have been utilised to determine the current status of the Ningaloo Marine Park on the Gascoyne coast. This information is being summarised in a report titled *Status of the Ningaloo Marine Park*. The aim of the report is to assist in the review of the Ningaloo Marine Park management plan. Apart from a few localised areas, the ecological values of the marine park are generally in excellent condition.

The Gascoyne coast is under significant pressure from increasing uncontrolled vehicle access resulting in localised degradation to coastal dunes in the adjoining pastoral leases and in the coastal portion of the marine park. The water quality and benthic communities of the park, such as corals, mangroves and macroalgae, are generally in excellent condition with minimal impacts from human activities. The intense recreational and commercial activity in the Coral Bay area has resulted in localised impacts to the coral communities and conflict between user groups. Marine mammals such as whales and dugongs are not being disturbed by human activities. However, turtle populations, particularly on the western coastline of North West Cape close to Exmouth, are being disturbed by human activities at nesting beaches. Litter is relatively common on both the land and in the water at popular recreation and commercial usage sites. Marine nature-based tourism activities, such as whale shark interactions, are being managed through licence conditions to ensure the park values are being maintained.

Contact: Jennie Cary, Senior Marine Ecologist, Marine Conservation Branch.

E-mail: jenniec@calm.wa.gov.au



The establishment and surveying of monitoring sites in Ningaloo Marine Park and the proposed southern park extension will assist with the long-term protection of the coral reefs.

Wildlife distribution map

The Marine Conservation Branch has recently compiled existing information on the distribution of marine wildlife in the Ningaloo Marine Park and surrounding area, from the Murion Islands in the north to Point Quobba in the south.

Existing scientific records, monitoring data and observational information from scientists and commercial tour operators were used to identify important nesting, nursery, breeding and feeding areas. Migratory paths and seasonal distributions for whalesharks, manta rays, sharks, whales, dugongs, dolphins, seabirds and turtles have also been compiled on the Branch's Geographic Information System.

Knowledge of the marine wildlife distributions will assist in the management of Ningaloo Marine Park, the current review of the Ningaloo Marine Park Management Plan and the planning process for the extensions to the marine conservation reserve system immediately to the north and south of the existing marine park boundaries.

Local communities on the Gascoyne coast are encouraged to provide any further marine wildlife information to help improve these datasets. If you are able to contribute, please contact the Department's Exmouth or Carnarvon District office, or the contact below.

Contact: Kevin Bancroft, Marine Ecologist, Marine Conservation Branch.

E-mail: kevinb@calm.wa.gov.au

Marine Information System

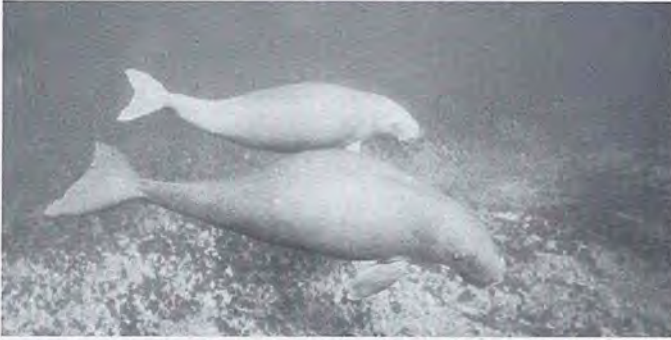
Spatial scientists and technologists have used sophisticated geographic information technology for many years. The complexity of geographic information has necessitated the involvement of specialist operators to acquire, analyse, process, query and present the data. However, in relation to marine conservation, there is a need for detailed geographic information to support reserve management decisions at a local level as well as a capacity for field staff to modify and upgrade this information. The development of a capacity to service these regional informational needs has commenced with a project to deliver a marine information system for the Ningaloo Marine Park.

The Ningaloo Marine Park Marine Information System will provide regional staff with a user-friendly information framework for easy storage, retrieval and updating facilities for a range of biophysical and social data relevant to marine management.

It is expected that the Ningaloo Marine Park Marine Information System will serve as a model for the development of similar information systems for the other marine conservation reserves in Western Australia.

Contact: Ray Lawrie, GIS Co-ordinator, Marine Conservation Branch.

E-mail: rayl@calm.wa.gov.au



Shark Bay is a nationally and internationally significant habitat for dugongs. (c) Doug Perrine

Shark Bay Marine Park

Tracking Dugongs

The Department of Conservation and Land Management, in conjunction with the Shark Bay Yadgalah Aboriginal Corporation Inc., Edith Cowan University in Perth and James Cook University in Townsville, has been investigating the movements and patterns of habitat usage by dugongs within Shark Bay Marine Park. Initiated in 1999, the project aims to provide more detailed information on dugong ecology to facilitate more effective conservation of one of the largest and healthiest remaining intact dugong populations in the world.

Combining state of the art technology with local knowledge, a total of 11 dugongs have been caught and tags attached to them so that their movements can be tracked. Catching a 300 kg animal in the water is no easy process but members of Yadgalah have a high success rate of catching and attaching tags around the animals' tails. The tags are shaped like a torpedo and float behind the dugong on a three metre tether. While the animals are restrained, a DNA sample and both length and girth measurements are taken in a process that takes less than 11 minutes from the time the animal is spotted and caught until it is released.

The tags either log or transmit the dugong's position and have an in-built release mechanism enabling tag retrieval without having to recapture the animal. Results to date have confirmed that dugongs in Shark Bay Marine Park undertake a seasonal migration in response to changes in water temperature and seagrass availability. Although this movement has been identified previously from aerial surveys, this project provides finer scale information in relation to the specific areas being used by individual dugongs. The current focus of the project is to determine which species of seagrasses are important to the dugongs during the different seasons of the year.

Aside from gaining important information about dugong ecology, the project has developed a unique relationship with the local Yadgalah community whose involvement has been essential for the successful implementation of the project.

A more detailed description of the project can be viewed at www.sharkbay.org

Contact: David Holley, Marine Fauna Zoologist, Department of Conservation and Land Management, Wildlife Conservation Section.

E-mail: davidho@calm.wa.gov.au



'Fishball' in Shark Bay Marine Park - a sight to see!

Fishball

Visitors to Turtle Bay, at the northern end of Dirk Hartog Island were treated to a spectacular demonstration of the ocean food web in action recently. An aggregation of baitfish in the shallow waters of the bay grew to a size of several hectares and attracted the interest of many of the large predators in the area. These included long-nosed grey sharks, which patrolled the edges of the aggregations in their hundreds, with individual sharks darting through for a quick feed. Bryde's whales also appeared and made the most of the bountiful supply of food. At the same time a large number of manta rays were observed schooling in the shallows along the northern end of Dirk Hartog Island.

The sequence of events which cause the fish to aggregate in this way is uncertain. Nutrient enrichment resulting from local upwelling may be the catalyst by fueling an increase in phytoplankton which could then stimulate an increase in zooplankton which, in turn, attract the small fish. The small fish would attract species further up the food chain and their resulting predator/prey interactions may result in the smaller fish aggregating in an attempt to avoid the predators.

Fishballs occur regularly along the Gascoyne coast in autumn/early winter. A large aggregation of baitfish near Cape Cuvier attracted enormous media attention in 1993. However, local fishers and charter boat operators report never before having seen such a large and spectacular event within the Shark Bay Marine Park. The Shark Bay aggregation started during the last week in May, persisting throughout June and, although it began to decrease in size during July, was still present at the end of August.

Contact: Richard Hall, Marine Reserves Officer, Department of Conservation and Land Management, Shark Bay.

E-mail: richardh@calm-denham.wa.gov.au

Shark Bay Marine Park



Richard Patty (left), Mike Purslow, and Dom Condo (right) from the Gascoyne Development Commission, enjoy the new Monkey Mia Visitor Centre.

Monkey Mia Visitor Centre opens

The new Monkey Mia Visitor Centre opened with a bang in June. Designed to increase community awareness, the new visitor centre is located on the foreshore at Monkey Mia, adjacent to the dolphin interaction area. The centre contains information and displays, a fish preparation facility for dolphin feeds and an amphitheatre for talks and slide shows.

On 19 June, the Minister for the Environment and Heritage, Dr Judy Edwards, formally opened the centre. The festivities included children's activities and a party for all ages which, thanks to the excellent music of Perth band Reel To Reel lasted well into the night. The festivities provided an opportunity for Shark Bay residents to celebrate their partnership with the Department of Conservation and Land Management and their achievements in acquiring the new state-of-the-art visitor facility.

Contact: Richard Hall, Marine Reserves Officer, Department of Conservation and Land Management, Shark Bay.
E-mail: richardh@calm-denham.wa.gov.au



Monkey Mia Visitor Centre opening day, 19 June 2001. Left to right: Dave Charles (Monkey Mia Reserve Ranger), Judy Edwards (Minister for the Environment and Heritage) and David Rose (District Manager).

Spreading the news

Management information relating to Shark Bay Marine Park is now available on the Shark Bay World Heritage Area website at: www.sharkbay.org The site allows visitors and residents to be better informed of what this unique area has to offer. The information covers the do's and don'ts as well as the location, including latitude and longitude, of management zone boundaries. The new website is part of a wider World Heritage-funded project to implement the Shark Bay Marine Reserves Management Plan.

The Monkey Mia dolphins have taken centre stage on the Department of Conservation and Land Management's website, Naturebase, with the establishment of an on-site camera at Monkey Mia. Website visitors can now view the dolphins by logging on to the website at: www.naturebase.net Additional information for Naturebase about Shark Bay Marine Park and other marine conservation reserves is being developed by the Marine Conservation Branch and a link will be established to the Shark Bay World Heritage Area website.

A newsletter has also been developed by staff in the Department's Denham office. Entitled *Monkey Mia News*, the newsletter is published on a quarterly basis and can be obtained by contacting the Department of Conservation and Land Management office at Monkey Mia Reserve, c/o 67 Knight Terrace, Denham 6537.

Contact: Richard Hall, Marine Reserves Officer, Department of Conservation and Land Management, Shark Bay.
E-mail: richardh@calm-denham.wa.gov.au



Monkey Mia News

Issue 3 Summer 2001
 Conservation
 Department of
 Environment and
 Heritage
 67 KNIGHT TERRACE
 DENHAM WA 6537

Welcome to the third issue of Monkey Mia News. This newsletter is produced twice a year, giving an update on what's happening in this important reserve, the Shark Bay World Heritage Area. Monkey Mia News is a free guide to the park and provides an understanding of the happenings at Monkey Mia, including the important research undertaken at Shark Bay. We'll just assume a Monkey Mia dolphin. Please read and receive regular newsletters and please contact us for more information.



A NEW VISITOR CENTRE FOR MONKEY MIA

The new 200 m² Visitor Centre has been built on the site of the old building. The new building is a modern, single-storey structure with a large glass frontage. It will be used for information, displays, and as a base for the visitor centre. The new building is a modern, single-storey structure with a large glass frontage. It will be used for information, displays, and as a base for the visitor centre.

The new building will be used for information, displays, and as a base for the visitor centre. The new building is a modern, single-storey structure with a large glass frontage. It will be used for information, displays, and as a base for the visitor centre.



New Patrol Vessel

Shark Bay district has recently taken possession of a new, purpose-built LeisureCat Gamefisher 7000 as a patrol vessel for operations in the Shark Bay marine reserves. The vessel has been named *Sirenia II*, which is the taxonomic name for the dugong family. With the reserves covering over 8,800 square kilometres the new vessel will allow for a greater range of operations and will lift the profile of the Department's operational management in the area. The vessel provides an improved surveillance & enforcement and research & monitoring capacity as well as enabling Departmental staff to access remote parts of the Shark Bay marine reserves. Under an interagency agreement, *Sirenia II* will also be available to assist the Department of Fisheries, Department for Planning and Infrastructure and Western Australian Police Service when required.

The vessel was officially 'launched' during the Shark Bay Fishing Fiesta in a special blessing ceremony prior to the annual blessing of the Shark Bay fishing fleet in August 2001.

Contact: Richard Hall, Marine Reserves Officer, Department of Conservation and Land Management, Shark Bay.
E-mail: richardh@calm-denham.wa.gov.au



The Sirenia II.

Rowley Shoals Marine Park Monitoring Program

A field trip to the Rowley Shoals Marine Park and the Mermaid Reef Marine National Nature Reserve is being planned for October 2001. The project is a collaborative effort between the Department of Conservation and Land Management (Marine Conservation Branch and staff of the Department's Broome District office) and Environment Australia with assistance from the Department of Fisheries. The project aims to establish and video representative, long-term permanent monitoring sites to facilitate routine assessment of the status of key benthic communities in these reserves.

A field team of eight will establish sites within proposed sanctuary, recreation and general use zones. Sites will also be established in areas used by tourism operators in order to assess the impacts of current and future use of these reserves. The Department's Broome office is preparing a report on human usage in the Rowley Shoals Marine Park to assist in selecting the locations of monitoring sites.

This project follows on from similar projects undertaken in Shark Bay Marine Park (1996 and 1997) and Ningaloo Marine Park (1998, 1999, 2000 and 2001) and continues the program of establishing a comprehensive suite of permanent monitoring sites in all marine conservation reserves in Western Australia.

Contact: Jennie Cary, Senior Marine Ecologist, Marine Conservation Branch.
E-mail: jenniec@calm.wa.gov.au



Divers use transects as a tool to monitor coral reefs.





Penguin Island in the Shoalwater Islands Marine Park supports a large proportion of Western Australia's population of little penguins. Photo courtesy of Terry Goodlich

The status of little penguins in WA

Dr Belinda Cannell from the University of Western Australia recently completed a report entitled *The Status of Little Penguins* (*Eudyptula minor*) in Western Australia. The status of little penguins in Western Australia was determined to provide a statewide context for the population in the Shoalwater Islands Marine Park. Only three islands in Western Australia were reported to have colonies of more than 200 penguins. Of these, only the colony on Penguin Island in the Shoalwater Islands Marine Park, has a population greater than 500 penguins making it the most important colony of penguins in Western Australia. The fact that this population exists so close to a large population centre suggests that it is also likely to be the most threatened and, as such, in need of particular attention to ensure the colony survives over the long-term.

Available biological information in relation to the Penguin Island colony was reviewed and summarised and existing and potential human and natural influences, both onshore and offshore, were identified. The threatening processes were ranked, strategies to address these threats were developed and performance measures were suggested.

This report was commissioned by the Marine Conservation Branch to assist in developing operational guidelines for the Shoalwater Islands Marine Park Management Plan.

Contact: Kevin Bancroft, Marine Ecologist, Marine Conservation Branch.
E-mail: kevinb@calm.wa.gov.au

Federal funds for moorings in marine conservation reserves

In April 2000, the Federal Minister for the Environment and Heritage, Robert Hill, awarded the Department of Conservation and Land Management a total of \$256,000 under the Natural Heritage Trust's National Moorings Program. These funds are for the purchase and installation of moorings in existing Western Australian marine conservation reserves to protect sensitive biological communities, such as corals and seagrasses, from being damaged by uncontrolled mooring and anchoring.

A Departmental 'Moorings Implementation Group' has been formed to develop site selection and installation priorities in the six existing marine parks. The Marine Parks and Reserves Authority/Department of Conservation and Land Management Draft Mooring Policy will provide the overall framework for the implementation of this project.

Contact: Nick D'Adamo, Senior Oceanographer, Marine Conservation Branch.
E-mail: nickd@calm.wa.gov.au



National Moorings funding announcement, Cottesloe Beach, 27 April 2001. From left to right: Nick D'Adamo (Marine Conservation Branch), Robert Hill (Minister for the Environment and Heritage), Peter Millington (Department of Fisheries), Julie Bishop MP (Federal Member for Curtin). Photo courtesy of Julie Bishop MP



MARINE AND COASTAL MANAGEMENT

Facilitation of marine research

Effective management of Western Australia's marine conservation reserves requires adequate understanding of their main physical, biological, geological, chemical and social characteristics to ensure that the existing and potential impacts of human activities can be properly assessed and managed. The Department's effort in facilitating marine research has centred around strategic and collaborative coordination of external research effort and, to a lesser extent, through limited tactical marine research conducted by the Department. The existing marine research capacity in Western Australia is mainly found in local universities, State and Western Australian-based Federal marine research agencies and private organisations. Collectively these groups have significant expertise and capacity that is relevant to marine biodiversity conservation and the management of human usage of the marine environment. In the past, marine research relevant to marine conservation has largely been undertaken on an opportunistic basis and has been reliant on the goodwill of the researchers and institutions involved. To complement this existing research effort, the Marine Conservation Branch (MCB) has initiated a small annual marine research funding program to help address the tactical research needs of the Department's marine conservation 'program'.

Directed primarily at local universities this initiative will provide seed-funding for priority projects. Direct financial support will generally be limited to funding for projects at honours level and to supplementary funding of masters or doctoral projects. The MCB will also facilitate operational and logistical support for these projects from the Department's regional offices.

Scientists interested in this initiative should contact Nick D'Adamo at the Marine Conservation Branch.

Contact Nick D'Adamo, Senior Oceanographer, Marine Conservation Branch

Email: nick@calm.wa.gov.au

South Coast staff training

Effective community involvement in marine reserve planning requires participants to have knowledge and understanding of the marine and coastal environment, marine conservation reserve concepts and the planning process.

To assist regional staff in this area, staff from the Marine Conservation Branch held a three-day training workshop for the Department's South Coast officers. Twenty-five staff from Busselton to Esperance attended a two-and-a-half day course in Albany to learn more about the natural, cultural, historical, recreational and commercial values of our marine and coastal environments. Presentation topics included an overview of Western Australian oceanography, marine wildlife and wildlife rescue procedures, tourism, fish and fishing, pollution, shipping and a thorough overview of marine reserve legislation, concepts and planning procedures.

A range of guest speakers provided presentations either in person or through the use of video. The Marine Conservation Branch would like to thank all those who generously gave their time and expertise to be involved in the delivery of this course.

South coast staff are now in a better position to undertake a low level of community liaison as part of their existing duties. By commencing a community liaison program well in advance of reserve planning processes, the public will be better informed and ready to participate effectively when reserve planning commences.

Contact: Dr Sue Osborne, Community Liaison Officer, Marine Conservation Branch.

E-mail: sueo@calm.wa.gov.au



Department of Conservation and Land Management staff enjoyed an excursion to the Great Southern Marine Hatcheries in Albany, as part of the South Coast Training Course.

A clear view and good luck

Aerial photography has been a major source of management information over land and coastal waters for decades. Even with the advent of high resolution airborne and satellite sensors, aerial photography remains a valuable tool. However, the acquisition of high quality aerial photos of the coastal environment still relies on having an expensive specialist aircraft in the air during those rare windows of opportunity when all the conditions are 'just right'. A good example of these difficulties is demonstrated in a recent attempt to obtain aerial photographic data of the Dampier Archipelago to Cape Preston area. The conditions considered necessary to ensure high quality photographs were as follows: no cloud—for obvious reasons, little or no wind and swell for 2 to 3 days beforehand, neap tide, low tide and no terrestrial runoff for maximum water clarity and all this occurring between 8.00 am to 10.30 am to minimise the effects of reflected glare off the water. By comparison, the conditions for comparative terrestrial aerial surveys are simply to have no cloud.

An April 2001 time slot was selected for the above Pilbara project. When the time came the required conditions were met and the 'go ahead' was given. Unfortunately all efforts were thwarted, this time by aircraft engine problems. Now its back to the drawing board to identify another of those rare windows of opportunity.

Contact: Ray Lawrie, GIS Coordinator, Marine Conservation Branch.

E-mail: rayl@calm.wa.gov.au



Aerial photography of the shallow reefs in Ningaloo Marine Park shows the variety and distribution of the habitats. Photo courtesy of Defence Topographic Agency, Canberra.

Base coastal data – a priority

While marine and coastal resources contribute significantly to the State's economic and social wellbeing, the acquisition of information needed to manage the impact of human activities on these resources is often prohibitively expensive. The acquisition and analysis of aerial photography and satellite imagery are good examples.

To overcome these inherent difficulties Government agencies in Western Australia with an interest in marine and coastal management, are adopting a coordinated approach to acquiring primary marine datasets. The Western Australian Land Information System (WALIS), an interagency group, has established a marine subcommittee to review data requirements and make recommendations to WALIS in relation to marine and coastal data acquisition priorities.

WALIS is currently considering a proposal from the marine subcommittee for gathering base data to map the Western Australian coastal zone. The proposal focuses on two areas of data capture and delivery. The first is for high resolution colour digital geo-referenced orthophotos (aerial photos with real world geographic information system coordinates) of the shallow water areas of the Western Australian coastal zone at a scale of 1:50000. The second proposal is for the capacity of water depth data over those areas of the coastal zone where the existing information is not adequate to produce a high resolution Digital Elevation Model (i.e. a computer model of the seabed). These two data sets will allow very accurate marine and coastal mapping and assist in marine planning and management for a range of Government programs in the marine environment of Western Australia.

Contact: Ray Lawrie, GIS Coordinator, Marine Conservation Branch.

E-mail: rayl@calm.wa.gov.au



Recherche Archipelago

Oceanography Review

A review of the oceanography of the Recherche Archipelago has been completed, with funding from the Marine Protected Areas Program of the Natural Heritage Trust. The Recherche Archipelago has been identified by the Marine Parks and Reserves Authority as a high priority for consideration as a marine conservation reserve under the *Conservation and Land Management Act*. The review was initiated to provide essential background information on the climate and circulation patterns of the area. An improved understanding of these characteristics will assist in assessing existing and potential threats to the ecological and social values of the area and, when the area is considered for marine reservation, will contribute to the reserve planning process.

The review was conducted by Mr Jonathan van Hazel, as a summer vacation project through the University of Western Australia's (UWA) Environmental Engineering department, under the joint supervision of Associate Professor Charitha Pattiaratchi from UWA and Nick D'Adamo of the Marine Conservation Branch. Dr George Cresswell of the Commonwealth Scientific and Industrial Research Organisation (CSIRO) Marine Research was also involved in the review. Mr van Hazel will build on this study through the preparation of an Honours thesis on the oceanography of the region. The thesis will include the application of a predictive numerical oceanographic computer model to the waters of the Recherche Archipelago and is due for completion in November 2001.

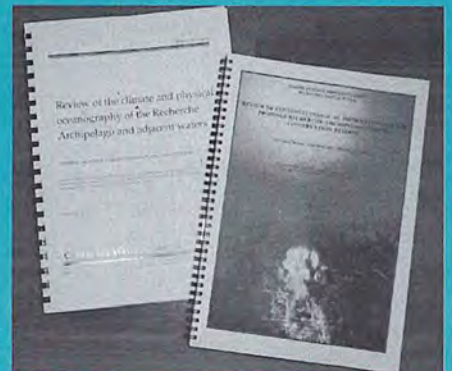
Contact: Nick D'Adamo, Senior Oceanographer, Marine Conservation Branch.
E-mail: nickd@calm.wa.gov.au

Review of existing ecological information

A literature review entitled *Review of existing ecological information for the proposed Recherche Archipelago marine conservation reserve* was completed by Sam Lee (University of Western Australia) and Kevin Bancroft (Marine Conservation Branch) in May 2001. The review contains a summary of existing ecological information, including major marine benthic habitats, marine and coastal fauna as well as information about the estuaries and coastal wetlands. Current recreational and commercial fishing were also summarised. The review also contains a comprehensive bibliography of literature relevant to the Recherche Archipelago region. The review will assist in the identification of key information gaps that will be needed when the planning processes for a marine conservation reserve in the Recherche Archipelago commences.

This report was partially funded by the Natural Heritage Trust's Coast and Clean Seas Marine Protected Areas Program.

Contact: Kevin Bancroft, Marine Ecologist, Marine Conservation Branch.



Reviews of available physical and ecological information relevant to the Recherche Archipelago region.

Eighty Mile Beach benthic survey

The inter-tidal foreshore of Eighty Mile Beach on the Kimberley coast is a site of international importance for migratory birds and has been identified in the Report of the Marine Parks and Reserves Selection Working Group: *A Representative Marine Reserve System for Western Australia* as an area worthy of consideration for marine conservation reserve status. The area is the focus of ongoing research into the distribution and species composition of organisms within the sediment, which make up the rich food source relied upon by the half a million migratory shore birds which visit each year. A large proportion of the world population of great knots (*Calidris tenuirostris*), red knots (*Calidris canutus*) and bar-tailed godwits (*Limosa lapponica*) depend on the inter-tidal areas of the Eighty Mile Beach and nearby Roebuck Bay for their survival.

Teams of volunteers from the local volunteer group Environs Kimberley conduct field surveys under the guidance of Broome-based Conservation and Land

Management staff, Departmental scientists and researchers from the Netherlands Institute for Sea Research. The volunteer teams are collecting data from specific sites to improve our understanding of the inter-tidal faunal communities. Many of the inter-tidal species are new to science and possibly unique to the area. Preliminary results indicate an extremely high biodiversity comprising 114 invertebrate taxa with polychaete worms, bivalves, gastropods and small crabs making up the bulk of samples taken for analysis. These surveys will supply crucial information to ensure the long-term welfare of numerous species of shorebirds and waders that migrate annually from as far away as Siberia.

Contacts:

Mike Lapwood, Marine Operations Officer, West Kimberley District, Broome.

E-mail: michaella@calm.wa.gov.au

Grant Pearson, Research Centre Manager, Woodvale Research.

E-mail: grantp@calm.wa.gov.au



Aerial view of the Ord River Dam. Photo courtesy of Nick D'Adamo

Ord-Bonaparte Program:

Mud and siltation in the lower Ord River

The rich marine ecosystems of the lower Ord River and adjoining coastal and riverine systems have recently been the focus of intensive oceanographic study by the Australian Institute of Marine Science. The study has been under the leadership of Dr Eric Wolanski, with collaborative support from the Marine Conservation Branch and Kununurra Regional office of the Department of Conservation and Land Management.

Nearly \$1/4M worth of current, sediment and meteorological monitoring equipment was deployed in October 2000 and aimed at detailing the rate at which the east arm of the lower Ord River is silting up following the construction of the Ord River Dam. The field studies are being coupled with state-of-the-art computer modelling, which together predict that the lower Ord River is silting so rapidly that the cross-sectional area of the river may be reduced to about one quarter of its original size in another 50-75 years. The main cause of this appears to be the elimination of regular strong flushing events, which followed heavy monsoonal/cyclonic rainfall. Lake Argyle now holds these massive flows behind the dam wall. The summer flushes were once responsible for regular purging of the silt that builds up in the lower reaches during the dry winter months. Studies will continue over the next two to three years, providing an important contribution to the information needed for management of the region. A scientific paper on the siltation of the Ord, co-authored by Nick D'Adamo of the Marine Conservation Branch, has been accepted for publication.

Contact: Nick D'Adamo, Senior Oceanographer, Marine Conservation Branch.

E-mail: nickd@calm.wa.gov.au

Indigenous harvesting of turtles

A collaborative submission by the Department of Conservation and Land Management and the Commonwealth conservation agency Environment Australia has been successful in acquiring funds from the National Heritage Trust. These funds will facilitate the study of indigenous harvesting of turtles by Aboriginal communities of the Dampier Peninsula, north of Broome, at One Arm Point, Lombading/Djarindjin and Beagle Bay.

The project recognises the important cultural significance of turtles to Aboriginal communities and will include the establishment of an information network, data collection and negotiation to ensure sustainable harvesting.

Information provided by Aboriginal communities indicates that about 250 turtles, mainly female green turtles, are taken in this area each year and that most of these animals are taken by members of the One Arm Point community. Further studies will be undertaken in partnership with indigenous communities when the hunting season recommences in October. The completion date for this project is October 2002.

Contact: Keith Morris, Group Manager, Woodvale Research.

E-mail: keithm@calm.wa.gov.au



Turtles are culturally significant for many indigenous communities.



STAFF PROFILE

Neil Taylor

Neil Taylor has recently taken on the position of Community Liaison Officer for the proposed marine conservation reserve in the Geographe Bay/Leeuwin-Naturaliste/Hardy Inlet region.

Neil was raised on a farm near the Ludlow Tuart Forest before completing a Commerce Degree at the University of Western Australia. He then went travelling and ended up in Canberra where he completed a Graduate Diploma in Recreation Planning. His first job in conservation was with the Australian Capital Territory Conservation Service and this led to the position of Manager of the Jervis Bay Nature Reserve.

Neil returned to Western Australia and joined the Department of Conservation and Land Management in 1985 as a recreation planner for the Central Forest Region. After seven years, he transferred to the Busselton District as the Program Leader for Parks and Visitor Services, which involved many projects in the Leeuwin-Naturalist National Park and surrounding areas.

Neil's long-term association with the south-west and close affiliation with the local community means he is well placed to liaise effectively in relation to the proposed marine conservation reserve. In his current role as Community Liaison Officer for the proposed marine conservation reserve, Neil works directly with the Marine Conservation Branch for 80 percent of his time and during the remainder he is involved with the Cape to Cape walking track and cave management on the Leeuwin-Naturalist Ridge.

STAFF NEWS

Doug Myers has retired after 12 years as the Exmouth District Manager and 25 years in the public service. Doug has overseen many management initiatives associated with both Ningaloo Marine Park and Cape Range National Park including the introduction of management zones, regulation of the whale shark industry and the introduction of national park fees to support ongoing management and the upgrading of facilities. We wish Doug all the best in his retirement, thank him for his years of service and hope that he now finds time to enjoy the environment that he has worked hard to protect.

Operations Officer, **Arvid Hogstrom**, departed the Exmouth district in June on a one-year exchange to Alaska, North America. The exchange was made with Danny Rosenkrans, from the St Elias National Park in Alaska, who will be working in Arvid's position in the Exmouth District office. This exchange will be an important learning experience for everyone involved.

The Department's Exmouth District office has also welcomed **Roland Mau** to their team of staff. Roland left his position as Senior Planner at the Queensland Parks and Wildlife Service in Cairns to become a Marine Conservation Officer for the Exmouth District office.

Brad Barton has taken up a promotion as Regional Leader for Nature Conservation in Kalgoorlie after six years as Operations Officer at Shark Bay. Brad's contribution to the management of the Shark Bay World Heritage Property has been much appreciated and we wish him all the best in his new position.

After several years as a Ranger in Tasmania, **Richard Hall** has moved to warmer climes as Marine Reserves Officer at Shark Bay. We welcome Richard to Western Australia and wish him well in his new position.

Kevin Crane has been wooed away from the Department's Marine and Coastal District in Fremantle to take up the position of Marine Operations Officer in Shark Bay. Kevin's main role at the Marine and Coastal District involved the development of nature conservation plans and policies. While he will be missed, Fremantle staff look forward to working with him in his new role.

Brad Daw, a National Park Ranger and Marine Operations Officer in the Marine and Coastal District has been seconded to the Rottneest Island Authority. Brad commenced work with the district in 1995 and his skills in visitor liaison, vessel operation and diving have been highly valued in the day-to-day management of Marmion, Shoalwater and Swan Estuary Marine Parks.

Chris Mather will transfer from Karijini National Park to fill the vacant position in the Marine and Coastal District resulting from Brad Daw's secondment. Chris has been a National Park Ranger for a number of years and has worked in national parks across Western Australia. Chris brings a wide range of operational skills and a high level of enthusiasm to the position.

Community Liaison Officer, **Kaylene Carter** has returned to the Marine Conservation Branch after spending five weeks on the Departmental Field Officer Recruit Training Program at Dwellingup. Kaylene is currently acquiring marine information to add to the Departmental website Naturebase but she will undertake additional training in October 2001 and March 2002 as part of the Field Officer Recruit Training Program.

Jacqui Jewell has been seconded to the position of Personal Assistant to the Director of Nature Conservation. Jacqui has been the Administrative Assistant for Marine and Coastal District for four years and we will miss her valuable contribution and warm and cheery nature around the Fremantle office.

OTHER NEWS

New West Australian Marine Science and Engineering Information web site

hotlinks useful for marine management

The Marine Conservation Branch provided funding for the development of a marine web-site as a collaborative student project with the Department of Environmental Engineering at the University of Western Australia (UWA). The site, under preparation, may be accessed through <http://www.cwr.uwa.edu.au/~pattiar/marinelinks>. The general concept of creating a web-based marine information site was enthusiastically embraced by UWA because it was seen to be innovative and beneficial to marine science and engineering education. The Marine Conservation Branch initiated the project to provide easy access to important management-related information for the Department's regional staff involved in the management of existing marine conservation reserves.

The site provides hotlink connections to many sites containing a wide range of marine data types and information, including tides and waves, winds, air temperatures, solar radiation, air pressure, and satellite-based information such as sea-surface-temperature, chlorophyll (as an index of phytoplankton) and indices of coral bleaching. The site also hotlinks to other marine research groups including universities and State and Federal research bodies (e.g. Australian Institute of Marine Science and Commonwealth Scientific and Industrial Research Organisation). UWA have adopted the maintenance and support of this new site as a core academic objective and are keen to be kept informed of new or other relevant hotlink addresses. Any suggestions on how to improve the site or additional information that should be included are most welcome. Associate Professor Charitha Pattiaratchi of UWA and Nick D'Adamo of the Marine Conservation

Branch are jointly supervising the production of the web-site by Mr Jonathon van Hazel, who is completing an Honours degree in Environmental Engineering at UWA. The web-site should be finalised by the end of the year.

Contacts:

Nick D'Adamo, Senior Oceanographer, Marine Conservation Branch.

E-mail: nickd@calm.wa.gov.au

Associate Professor Charitha Pattiaratchi, University of Western Australia.

E-mail: pattiar@cwr.uwa.edu.au

MARINE CONSERVATION SEMINAR SERIES

Since the June issue of *Marine Conservation Matters*, nine lunchtime seminars have been held at the Department of Conservation and Land Management Fremantle office. These were:

- **The ecology of the Little Penguin.**
Dr Belinda Cannell, University of Western Australia.
- **Australian Institute of Marine Science activities in Western Australia.**
Dr Andrew Heyward, Australian Institute of Marine Science.
- **Aquaculture in Western Australia.**
Simon Bennison, Aquaculture Council of Western Australia.
- **Tourism in marine parks in Western Australia.**
Steve Crawford, Western Australian Tourism Commission.
- **Migratory shorebirds in the Swan Estuary Marine Park.**
Dr Mike Bamford, Bamford Consulting Ecologists.
- **Dugong research in Shark Bay.**
David Holley, Department of Conservation and Land Management, Wildlife Conservation Section.
- **Management strategies for protected areas.**
Dr Susan Moore, Murdoch University.
- **Acoustic techniques for benthic classification.**
Professor John Penrose, Curtin University.
- **No-take areas in fisheries management.**
Dr Trevor Ward, University of Western Australia.
- **Fish, invertebrate and algal populations: Do they differ between fished and unfished areas of the Ningaloo Marine Park.**
Mark Westera, Edith Cowan University.
- **Commercial fishing in Western Australia: Issues and challenges.**
Guy Leyland, Western Australian Fishing Industry Council (WAFIC).

Interstate assistance for whale emergency

Wildlife and marine operations staff went on standby recently when the South Australian National Parks and Wildlife Service (NPWSA) requested their assistance to rescue an entangled whale.

On 2 July a young southern right whale female, about 14 metres long and 50 tonnes in weight, arrived at the Head of the Great Australian Bight with rope and a buoy tangled around her tail. NPWSA staff quickly sought advice from around Australia including Western Australia where a team of three staff with experience in whale disentanglement provided advice and made preparations to fly to the scene.

Complex plans for disentangling the whale took shape: a mammoth task with many difficulties including a remote, almost inaccessible location, rough seas and many sharks. The entangled whale was in a nursery area of the whale sanctuary amongst others with newborn calves, so the consequences of disturbance to cows and calves were considerable. The weather was not on their side, but a brief window of opportunity was identified and the plans were put into action.

Meanwhile, the whale was monitored from the cliffs and by aerial surveillance and just as the rescue team was about to begin the 60-hour journey from Adelaide and the Western Australian staff were about to board the plane to South Australia, spotter plane crews reported that the young whale was floating motionless on her side with up to eight sharks feeding on the body.

Although too late to rescue this young whale, Marine Wildlife Officer, Doug Coughran later traveled to South Australia to conduct entangled whale rescue training for local staff. The course covered all aspects of incident control including whale rescue techniques, staff safety, and dealing with onlookers and the press. It also provided a positive forum for sharing experiences and ideas about managing other marine wildlife emergencies.

Contacts:

Sue Gibbs, Office for Coast and Marine, National Parks and Wildlife, South Australia.

E-mail: Gibbs.Susan@saugov.sa.gov.au

Doug Coughran, Supervising Wildlife Officer, Wildlife Protection Section.

E-mail: douglasc@calm.wa.gov.au

What do you think?

This is the fifth issue of *Marine Conservation Matters* and while we have had some feedback from readers—thank you—it is now time to review the usefulness of the newsletter as a method of communication. We would like to hear your views about the content, presentation and distribution. Do you think that *Marine Conservation Matters* helps to raise community awareness about Western Australian marine conservation issues and the marine management initiatives of the Department of Conservation and Land Management?

Please forward your comments to Sue Osborne by e-mail on sueo@calm.wa.gov.au, phone on 94315100 or by mail to 47, Henry Street, Fremantle, 6160, and a summary of your comments will be published in the next issue

MARINE CONSERVATION CONFERENCE

Initial planning has begun for the Department's inaugural *Marine Conservation Conference* to be held early in 2002. The two-day conference will provide a forum for Departmental staff involved in all aspects of marine conservation to meet, present and discuss the full range of issues affecting their work. Participants from local universities, other Government departments, non-government organisations and industry will be invited to participate to provide an external perspective of the various issues that we deal with on a day to day basis. A small committee will be formed from representatives of key areas in the Department to organize and run the conference.

Contact Sue Osborne or Kaylene Carter by phone or at the email address below if you have any suggestions for the format, content or hosting arrangements of the conference or wish to be part of the organizing committee.

Contacts:

Dr Sue Osborne, Community Liaison Officer, Marine Conservation Branch.

E-mail: sueo@calm.wa.gov.au

Kaylene Carter, Community Liaison Officer, Marine Conservation Branch.

E-mail: kaylenec@calm.wa.gov.au

Marine Conservation Matters is produced by the Marine Conservation Branch of the Department of Conservation and Land Management, to broadcast up-to-date information about marine conservation activities in the Department. If you have any queries regarding our newsletter please contact Sue Osborne at the Marine Conservation Branch. Ph: (08) 9432 5100, Fax: (08) 9430 5408 or email: sueo@calm.wa.gov.au