

Watching over our oceans: involving community in marine monitoring

It is important to monitor the marine environment so we can ensure it stays as pristine as possible, but how do you effectively monitor a coastline that is 12,500 kilometres long without unlimited financial resources?

The Marine Community Monitoring Program, a new and ambitious project, aims to involve all interested Western Australians in helping to conserve our unique marine environment.



BY JENNIE CARY AND TIM GRUBBA

The mainland coast of Western Australia is about 12,500 kilometres long and there are 3,424 offshore islands. Our coastal waters contain coral reefs, mangrove forests, seagrass meadows, rocky reefs, extensive areas of soft sediment and open ocean. These ecosystems are home to a rich array of plants and animals such as seagrasses, corals, fish, starfish, shells, dugongs, turtles, whales, dolphins, sea-lions, penguins, sharks and crocodiles. Some of these animals are rare and in need of special protection, while some sea and shorebirds found along our coastline migrate from Asia and are protected by international conservation treaties.

WA's Ningaloo Marine Park protects Australia's largest fringing coral reef. The Shark Bay Marine Park, within the World Heritage Area, has the world's most extensive seagrass meadows, the famous Monkey Mia dolphins and rare communities of stromatolites. Many of the State's marine plants and animals, particularly those in southern

temperate waters, are found nowhere else in the world.

Unlike many places elsewhere, our marine environment is generally in excellent condition. Seagrasses are in good condition except for those in Albany's harbours, Cockburn Sound and parts of Geographe Bay. Most coral reefs are in pristine condition and most mangrove forests are in good condition except for some loss through industrial and landfill activities and coastal development. Around metropolitan Perth, the marine environment has been contaminated by sewage and other run-off. About 27 exotic species have been introduced into WA waters. Commercial fishing stocks are generally being managed at sustainable levels, though intensive fishing around highly populated areas has resulted in depletion of key target species, such as dhufish, from the more accessible areas and, at Shark Bay, snapper stocks have been depleted by overfishing.

POPULATION PRESSURES

The marine environment of this State is owned by all Western Australians. Unlike the land, where usage rights are defined by titles and boundaries, the sea is a common asset available to all users. The flip side of this is that as our population increases, so too does pressure on our ocean and its inhabitants. Much of the degradation of marine environments elsewhere in the world has resulted simply from

increased human usage, often with limited knowledge and understanding that it is actually happening until it is too late.

It is important, therefore, to monitor our marine environment closely so we can understand the implications of our activities. Good indicators of the state of the ocean may include water quality and coral, seagrass and fish 'health'. If these vary from what is 'normal', something can be done to investigate the causes of such changes and, if necessary, to take action to rectify the problem before it is too late.

Management agencies and scientists recognise that they cannot do this enormous task on their own and need to involve the broader community. Many local communities also recognise that everyone (including Government agencies, scientists and community members) has a mutual responsibility to protect our marine environment and are keen to help.

DEVELOPING PARTNERSHIPS

In WA, the government has sought to tap into this enthusiasm through a new project known as the Marine Community Monitoring Program. The program was developed by the Department of Conservation and Land Management and the Australian Marine Conservation Society WA (AMCS), with significant assistance from the WA Museum and Marine Education Society of Australia.

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Top: Seagrass meadow.

Photo - Eva Boogaard/Lochman Transparencies

Main: Getting ready to monitor mangroves and water quality.

Photo - Clay Bryce

Below: Data collected by the

community on dugong sightings will help in understanding their distribution and habitat preferences.

Photo - Geoff Taylor/Lochman Transparencies



The Marine Community Monitoring Program is at the 'cutting edge' of community programs providing data for marine management agencies. It is similar to programs such as 'Eye on the Reef' (coral reef) in Queensland, 'Reef Watch' (temperate reefs and fish) in South Australia and 'REEF', which collects data on fish diversity and abundance in the USA and Caribbean. However, WA's Marine Community Monitoring Program is the most extensive and ambitious program of its kind in the world.

The main aim of the program is to develop partnerships between managers, scientists and the community. It will result in an early warning system to detect and rectify any changes in the marine environment. The program provides the tools for community members to help monitor and manage the health of marine and coastal areas. The monitoring methods are easy to use and mostly fun to do, although there are some more complex methods for those who have more time and interest to develop greater expertise. The data that are collected will complement the monitoring data gathered by Government agencies and scientists. Together, these data will be used by management agencies and local communities to help manage human impacts on their local marine environments.

The Marine Community Monitoring Program has been designed to overcome several fundamental obstacles to successful community involvement in marine management. The first obstacle is the difficulty in positively identifying all but the most common marine plants and animals. The program has responded to this challenge by developing an easy-to-use CD-ROM, entitled *Marine life in Western Australia*. The CD-ROM, developed in 1998, is an aid to identifying about 400 marine plants and animals commonly found in WA tropical and temperate coastal waters. Copies of the CD-ROM can be purchased from the Department of Conservation and Land Management's NatureBase website or from its headquarters in Kensington.



Other obstacles are the public's limited knowledge of scientific methods and experience in data collection, along with the difficulty of maintaining community enthusiasm over the long time scales needed to obtain meaningful data. To address these concerns, the program developed a manual of user-friendly monitoring methods and a database. The database is linked to the WA Atlas website to allow easy access to the data and, hence, provide the feedback necessary to maintain community interest. Both the CD-ROM and manual have been completed, with both projects winning National and State awards for excellence. The program, even before it has been completed, has been in demand

Top: Data collected by the community on whale sightings will complement data collected by scientists.

Photo – Geoff Taylor/Lochman Transparencies

Above: A diver records coral predators on coral reefs, contributing to the understanding of natural versus human activities.

Photo – Sue Morrison

from government and non-government agencies throughout Australia.

The final obstacle is the public's limited operational training and experience in monitoring the marine environment. To address this, a training program is being developed to ensure such activities are carried out effectively and safely.



Above: A diver takes an underwater video along a marked transect, to provide baseline data for detecting future changes.



Left: Local knowledge and enthusiasm are underutilised in the management of our marine environment.

Photos – Sue Morrison

WHO CAN TAKE PART?

All Western Australians with an interest in the marine and coastal environment can take part in the Marine Community Monitoring Program, either as part of a community group or as an individual. Invaluable data can be collected from people from all walks of life, who are living, working or holidaying along the WA coastline. You may be working on a pearl farm or an oil rig in a remote area, or perhaps you are a recreational fisher living in a city. You may collect some data while

on holiday, or monitor the health of your local environment regularly. Local residents, indigenous communities, neighbouring land owners, recreational boating, diving and fishing clubs, nature study enthusiasts and collectors, scientists, conservationists, school groups, local government employees, commercial fishing operators, aquaculturists, commercial tourism operators and members of the mining and petroleum industries have all expressed an interest in participating.

WHAT YOU CAN MONITOR

A manual of monitoring methods has been developed. The manual provides background information on each method and describes its relevance to management agencies. It tells you how to select and describe your site,

advises how and when to monitor, and how to collect and store the data. The manual also describes the level of difficulty of each method, outlines equipment and safety measures required, tells you how to be environmentally sensitive, shows you how to find your data on the web, describes existing community monitoring programs and includes a list of further references.

The 33 monitoring methods in the manual cover the physical, biological and social environment. The methods were developed in conjunction with marine scientists and managers to ensure they were scientifically sound.

Methods to monitor the physical environment cover parameters such as beach width, beach structure, water clarity and water temperature. The biological environment includes coral, seagrass and mangrove health, algal blooms, fish, marine mammals and introduced marine pests. The social environment includes beach and underwater litter and human usage.

After the Department of Conservation and Land Management has received your data, it is checked for errors and inconsistencies and then entered into the Community Monitoring Database. Maps showing the results of your data will be produced as part of the community monitoring data analysis process. These give a very good overview of data collected for each method. The maps will be available on the Internet via the WA Atlas (<http://www.walis.wa.gov.au/atlas>) —linked from NatureBase.

Once the data is collated, it becomes an important component of the information-base that community groups, scientists, government departments such as the Department of Conservation and Land Management, and the Department of Environmental Protection and local government authorities can use to identify and remedy undesirable trends.

WHO'S ALREADY INVOLVED?

Many community groups have already helped to trial the methods from the monitoring manual in the field. These groups have selected methods from the manual that address



Underwater photographic clubs are an important source of expertise in marine conservation.

Photo – Clay Bryce

environmental issues that concern them in their area.

Students from North Albany Senior High School are monitoring the health of seagrass communities in Princess Royal Harbour. Large areas of seagrass have been lost from the harbour over the last 30 years as a result of nutrient discharges. Information collected by the school is being used by the Albany Waterways Management Authority, the local agency monitoring the recovery of the seagrass meadows since nutrient loads into the harbour were reduced. Science teacher Jim Kneale's involvement in seagrass monitoring was recently recognised with an award from Coastwest/Coastcare.

Chris Gibbs, a science teacher from Bunbury Cathedral Grammar School, is using methods from the manual to monitor the health of the marine environment off Dalyellup Beach, which is under increasing pressure from urban development. He is collecting water temperature data using temperature loggers. The information is being used by oceanographers from the Department of Conservation and Land Management and CSIRO to study ocean currents in the area and 'ground truth' satellite images. Chris is hoping to involve his science students in the project once he has developed a safe study site.

The Department of Conservation and Land Management Bush Ranger cadets from John Septimus Roe Anglican Community School are using methods from the manual to monitor the health of

Mettams Pool in Perth's Marmion Marine Park. A protected pool within a barrier reef, that lies adjacent to West Coast Highway, Mettams is one of the most accessible snorkelling sites in the marine park. Information collected by the cadets, which includes beach litter surveys, will be used by the Department of Conservation and Land Management to help manage the marine park.

Two dive clubs, The University of Western Australia Underwater Dive Club and the Dive Buddy Club of Rockingham, have been collecting information on coral predators, including the crown of thorns starfish and marine snails, in the Ningaloo Marine Park and Dampier Archipelago. The data is being used by the Department of Conservation and Land Management to better understand the impacts of natural influences on coral communities and to help separate natural impacts from human impacts.

Students from Fremantle Primary School are undertaking beach litter surveys on Bathers Beach in Fremantle, using the beach litter method from the manual. The information collected is sent to the Department of Conservation and Land Management so the beach litter at Fremantle can be compared with beach litter from other areas monitored in WA.

One thousand volunteers monitored beach litter at 45 sites during the Coastal Clean-up 2001 in May. The event was organised by AMCS and Keep Australia Beautiful. The event used the beach and underwater litter methods from the manual to collect data on litter type and

densities. The data will be displayed shortly on the WA Atlas website.

GETTING INVOLVED

The Marine Community Monitoring Program is developing partnerships between the community, managers and scientists. The community contributes local knowledge, expertise, energy and commitment, resources and access to almost all our coastal waters. Managers and scientists will continue to implement complementary monitoring programs and will also provide training, scientific expertise, support, advice, feedback, data interpretation and management decisions.

Once the training program has been developed, it is expected that the Marine Community Monitoring Program will become fully operational and made available to many more groups throughout WA. If we work together, the program will give us all the chance to give something priceless to ourselves and future generations—healthy oceans and beaches. The more individuals and community groups become involved, the more successful the program will be.

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Funding for the Marine Community Monitoring Program was provided by Coastwest Coastcare, an initiative of the Natural Heritage Trust, and the Department of Conservation and Land Management.

You can find out the latest information about the Marine Community Monitoring Program and how to register your interest by visiting the NatureBase website at <http://www.naturebase.net>.

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DEPARTMENT OF
Conservation
 AND LAND MANAGEMENT
Conserving the nature of WA



Within 40 years, the numbat has risen from near extinction to endangered with 10 populations in WA and interstate. See 'Numbats Forever' (page 17).



The forces that shaped the geology and landforms of the south-west began more than 3,500 million years ago. Read the fascinating story on page 10.



The Marine Community Monitoring Program is a new and ambitious program to involve the community in keeping our oceans clean. See page 35.



Shark Bay Marine Park provides spectacular opportunities for divers and snorkellers. No wonder it is called Bay of Delights. See page 23.



The history of Aboriginal occupation in the Leeuwin-Naturaliste region spans 50,000 years. Find out more in 'History from the Caves' (page 40).

C O V E R

Leschenaultias are some of the most widely known and recognisable plants in Western Australia. They have fantastic horticultural value and provide glorious floral displays. The wreath leschenaultia is a favourite with visitors during our wildflower season. See page 23.



Cover illustration by Philippa Nikulinsky