

Batemans Marine Park



RESEARCH WORK PLAN 2006-07

Batemans Marine Park

INTRODUCTION

The Batemans Marine Park (BMP) is located on the south coast of NSW from the most northerly point of Murramarang Beach near Bawley Point to the southern side of Wallaga Lake entrance at Murunna Point. The marine park extends from the three nautical mile offshore limit of NSW waters to mean high water mark within all rivers, estuaries, bays, lagoons and inlets, and saline and brackish coastal lakes (excluding Nargal Lake).

The region is a spectacular and beautiful section of coast that contains many natural features including the Murramarang coast, which has large areas of rocky reefs and numerous islands that provide breeding areas for many seabird species; highly significant coastal lakes and lagoons, including Durras, Brunderee, Tarourga and Brou Lake, many of which have been recommended for protection; and the Clyde River and Batemans Bay, an area with significant estuarine habitats including mangrove and saltmarsh. The area also has several offshore islands, including Tollgate Islands, which is one of the most important breeding sites for the endangered grey nurse shark; and Montague Island, a south coast icon renowned for pelagic fish, seals, grey nurse shark, penguins and many other seabird species.

The area is the traditional country of the Yuin people and contains many sites of historic and cultural significance. The Yuin people have a long association with the south coast which continues today, with a continuing tradition of cultural resource use. The Marine Park area is of social, cultural and economic importance to the region and caters for a wide range of user groups. It is a particularly popular area for holidaying, recreational and charter fishing, diving and boating. There is also a wide range of commercial fishing activities and aquaculture (principally oyster farming) within several of the rivers and lakes.

Monitoring and research provide information to make informed management decisions at the BMP for the conservation and sustainable use of the park mandated by the *Marine Parks Act 1997*. The primary objective of the research program is to assess the effectiveness of zoning and other management actions. The program also aims to expand our knowledge and understanding of the marine environment, detect unforeseen changes to the health of marine ecosystems and also report on the nature and extent of activities occurring in the Marine Park.

This Research Work Plan 2006-07 outlines the research and monitoring projects that the Marine Parks Authority intends to undertake directly, or through collaboration with external research providers. It refers specifically to projects funded by the Marine Parks Authority and does not include research conducted within the Marine Park that is funded from other sources. Additional projects may be added to the plan during the year as further resources become available.

The research and monitoring projects are categorised under five overall areas.

- 1. Biodiversity and ecological processes**
- 2. Indigenous and non-Indigenous culture and heritage**
- 3. Ecologically sustainable use**
- 4. Specific impacts**
- 5. Socio-economic impacts**

Assessment of nearshore rocky reef assemblages within Batemans Marine Park

Background

Shallow rocky reefs are an important habitat within the Batemans Marine Park covering a considerable proportion of nearshore areas adjacent to both the mainland and offshore islands. A proportion of this habitat type is proposed to be included within Sanctuary Zones leading to a removal of fishing pressures. To properly determine whether changes observed within these areas are the result of protection (rather than natural variation in space and time) it is important to conduct effective replicated surveys within and adjacent to proposed Sanctuary Zones. Observations of changes occurring in each of these areas following protection will build on the information currently available from long-term monitoring of similar areas with Jervis Bay Marine Park and numerous other temperate reefs being examined throughout Australia.

The project will conduct underwater visual census of fish, large mobile invertebrates and macroalgae within a number of Sanctuary Zones and adjacent Habitat Protection Zones. The degree of replication should allow the detection of biologically significant changes in the abundance and size distribution of a wide range of species through time and between zone types. The survey methodology is broadly based, collecting as much information on as many species as possible in the time available. The intention of this methodology is to not only detect changes in heavily exploited species, but to also be able to detect any other broader habitat changes resulting from the removal of fishing (such as changes in the extent of urchin barrens), and to document long term variability in the reef assemblages within this region.

Objectives

- Determine the species composition of fish, macro-invertebrates and macroalgae at selected shallow water rocky reefs within Batemans Marine Park
- Compare number of species, abundance and size composition of selected fish and macro-invertebrates between Sanctuary and Habitat Protection Zones

Project Contacts

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This project address the following issues identified in the Strategic Research Plan:

Biodiversity and Ecological Processes

- Conduct biodiversity assessments of selected taxa
- Assess the spatial and temporal patterns of assemblages
- Examine multi-species linkages and mechanisms determining rocky reef assemblage structure and dynamics

Ecologically Sustainable Use

- Examine the optimum design of marine parks: size, patterns of zoning
- Abundance of key species of fish and invertebrates
- Effects of fishing on reef community structure and function

Mapping and classification of continental shelf seabed habitats in the Batemans Marine Park

Background

The primary goal of the Marine Parks in NSW is to establish a comprehensive, adequate and representative (CAR) system to protect marine biodiversity and maintain ecological processes. As detailed spatial information on the distribution of marine biota is limited, seabed habitats defined within a hierarchical classification structure are increasingly being used as effective surrogates for biological diversity, provided they are appropriately validated and all representative habitats are included. Remote sensing techniques for mapping of seabed habitats have developed considerably in the past decade and are now recognised as a cost-effective method of diversity assessment for Marine Park planning and an important component of the overall research required to identify the distribution and structure of marine ecosystems and habitats.

The Batemans Shelf bioregional assessment provided information on the broadscale distribution of marine and estuarine ecosystems and intertidal and nearshore habitats. While some species and assemblage data was available for marine mammals, threatened birds and estuarine fishes, overall there was little data available on the distribution of subtidal habitats and their associated biota. Such information was identified as important to provide a more comprehensive assessment of marine biodiversity in the region.

To meet the primary objectives under the *Marine Parks Act* all major benthic habitats within a marine park should be represented within higher protected areas (Sanctuary and Habitat Protection Zones). There is currently limited knowledge of deep subtidal habitats (i.e. >10 m depth) within the Batemans Shelf Bioregion, with only small areas of rocky reef mapped from existing aerial photographs and hydrographic charts, none of which have been ground-truthed. There is even less information available on the structure and distribution of subtidal soft-sediment habitats. Given the recent findings in other NSW marine bioregions of significant areas of subtidal reefs, it is also likely that such habitats exist within the Batemans Shelf bioregion. An initial assessment of the available broad-scale bathymetry indicates extensive reef habitat along sections of the coast north of Batemans Bay and around Montague Island, Brush Island and Tollgate Islands. There is a clear need to assess the distribution and extent of subtidal habitats within the Batemans Marine Park to assist the zoning process to ensure habitats are adequately represented within highly protected areas.

Objectives

- Determine the bathymetry and distribution and extent of seabed habitats in selected areas of the continental shelf within the Batemans Marine Park
- Conduct detailed ground-truthing using video
- Produce a range of spatial layers of seabed habitats defined within a hierarchical habitat classification system

Contacts

Peter Davies - NSW Department of Environment and Climate Change
Alan Jordan – NSW Department of Environment and Climate Change

This project aims to address the following specific research issues identified in the Strategic Research Plan:

Biodiversity and ecological processes

- Map and assess the spatial extent and structure of seabed habitats and key taxa

Ecologically sustainable use

- Identify unique & sensitive marine habitats and communities
- Examine the optimum design of marine parks: size, patterns of zoning

Benthic fish assemblages on deep water reefs within the Batemans Marine Park

Background

Bateman's Marine Park represents a significant challenge to management agencies as, with regard to marine biodiversity, there are key knowledge gaps. In the absence of detailed species information, the development of the zoning plan has used seabed habitats as a surrogate to identify areas to be included within sanctuary zones to maximise the likelihood that these 'no-take' areas contain a representative selection of biological diversity.

Recent swath mapping of the region has identified extensive rocky reef on the continental shelf, which in some places extends from inshore waters to the eastern edge of the marine park. These habitats have been poorly studied in this region, with information restricted to physical features such as depth and profile. While seabed habitats are frequently used as a surrogate for spatial patterns in marine biodiversity, there is little information on the fish diversity and composition associated with rocky reefs in depths >20 m within the BMP. At present reef habitats are defined on the basis of depth (0-20 m, 20-60 m and 60-200 m). While the separation at the 20 m contour line relates to an average depth where benthic assemblages change from macroalgal dominated to that containing mostly sessile invertebrates (mostly sponges, ascidians, bryozoans and cnidarians), there is little information on depth variation in fish assemblages.

These deep reef areas used by recreational and commercial fishers, with many targeted species being associated with reef habitat. The inclusion of several areas within BMP where deep reef is included within Sanctuary Zones provides an opportunity to assess changes in species and size composition of fish, sharks and rays resulting from these fishing closures. Baited Remote Underwater Video systems (BRUV's) is a technique commonly used throughout Australia to examine fish assemblages and population structure in deeper reefs that are below safe diving depths. Standardised baits are used to attract fish to a viewing area, being recorded horizontally by a video camera.

The use of depth to divide rocky reefs into different habitat types for marine park zoning purposes assumes that assemblages of fish differ at increasing depths across the continental shelf. This has been commonly found in many sites throughout the world but requires testing within the Batemans region to ensure zoning arrangements provide adequate protection to the full range of fish species. Deep reefs are difficult to monitor using traditional techniques such as Underwater Visual Census (UVC), but BRUV allows for an assessment of fish composition and abundance of these deeper reef habitats. This project will complement the similar assessment being conducted in BMP using UVC within the project 'Evaluating the benefits of protection to shallow rocky reef ecosystems within the Batemans Marine Park'.

There is a clear need to monitor the effectiveness of marine park zoning within the BMP, and the establishment of baseline information on the composition and abundance of fish on deep reefs is one component of this evaluation. Given the varying levels of fishing pressure between Sanctuary, Habitat Protection and General Use Zones with the marine park there is a need to include these three zone types in order to establish baseline information on species such as snapper.

Objectives

- To determine the composition and relative abundance of fish, shark and ray species with deep reefs (>20 m) within the BMP
- To collect baseline information within Sanctuary , Habitat Protection and General Use Zones at the commencement of the zoning plan
- To obtain size composition information for snapper

Contacts

Alan Jordan – NSW Department of Environment and Climate Change

This project aims to address the following specific research issues identified in the Strategic Research Plan:

Biodiversity and ecological processes

- Map and assess the spatial extent and structure of seabed habitats and key taxa

Ecologically sustainable use

- Identify unique & sensitive marine habitats and communities
- Examine the optimum design of marine parks: size, patterns of zoning