







Banded seasnake, Scott Reef. Photo: Australian Institute of Marine Science.

Since 1998, there have been many decisions that have helped formulate the Australian Government's approach to establishing an MPA network. These include the development of a clearer understanding of how the *Guidelines for Establishing the National Representative System of Marine Protected Areas* (ANZECC 1998) will be applied by the Australian Government, drawing on the best available scientific information. The Department of the Environment, Water, Heritage and the Arts, in consultation with other Australian Government agencies, has set out this approach in the *Goals and Principles for the Establishment of the National Representative System of Marine Protected Areas in Commonwealth Waters*. The goals and principles are derived from the *Guidelines for Establishing the National Representative System of Marine Protected Areas* and the Australian Government's implementation experience to date to ensure proper consideration of ecological and socio-economic requirements. These goals and principles are set out in Section 4.1 of this chapter.

The Australian Government considers that measures other than MPAs also play a critical role in biodiversity conservation and that the existence and effectiveness of those measures should be taken into account in assessing the adequacy of any MPA network.

In addition to MPAs, the Government supports the use of spatial measures in fisheries management. While the two spatial management mechanisms are designed and used for different purposes, they can

have mutually beneficial outcomes. Fisheries-specific measures, including both temporal and permanent area closures, are developed according to the particular goals and circumstances of each fishery. MPAs are developed in Commonwealth waters for the purpose of general biodiversity conservation or to address threats to particular species or habitats – not to manage fisheries. Nevertheless, MPAs may lead to improved fisheries performance and fisheries closures may contribute to biodiversity conservation. The Government seeks to ensure that the design of MPAs takes into account the potential for beneficial impacts on fishery resources and that MPAs are selected and zoned to enhance or conserve fish stocks where possible.

MPAs have long-term benefits for the environment and the economy. However, even where impacts can be minimised, they may adversely affect some businesses in the short to medium-term. The Government recognises that a new MPA network may transfer some marine resources from current production to biodiversity conservation. Therefore, before any new MPAs are declared, the socio-economic costs and benefits will be assessed and the Government will decide on the provision of any adjustment assistance to affected businesses.

## 4.1 Goals and principles

The Australian Government is committed to the development of a National Representative System of MPAs by 2012. The development of Marine Bioregional Plans for each of Australia's five large scale Marine Regions provides an opportunity to make substantial progress towards this goal. Areas suitable for inclusion in the National Representative System of MPAs will be identified during the planning process.

The network will be representative of the 41 provincial-scale bioregions recognised in Commonwealth waters, as identified by the *Integrated Marine and Coastal Regionalisation of Australia Version 4.0* (IMCRA v.4.0) <[www.environment.gov.au/coasts/mbp/publications/imcra/imcra-4.html](http://www.environment.gov.au/coasts/mbp/publications/imcra/imcra-4.html)>. The focus is to ensure that MPAs are developed for those provincial bioregions that are currently not represented, or are under-represented, in MPAs. (Note the Bioregional Profile uses the terms *provincial bioregion* and *bioregion* interchangeably to refer to the provincial bioregions defined by IMCRA v.4.0).

Because the management of MPAs may require conditions to be put on the nature and extent of activities that can occur within them, the identification of areas suitable for inclusion in the National Representative System of MPAs needs to be based upon clear goals and principles. These goals and principles recognise both the scientific information available and the interests of ocean users whose activities may be affected by new MPAs.

The approach seeks to draw on available scientific information, while recognising that the information

base is poor for some areas. Large areas of each Marine Region are far offshore, comprised of very deep water, and have not been subject to detailed study or data collection. In these circumstances, existing and peer-reviewed information will be supplemented with information drawn from known relationships between biodiversity and the physical environment – that is, where detailed species and habitat data are lacking, surrogates for biological diversity (such as water depth, substrate type and geomorphology) will be used. This is because we know that marine habitats with different physical characteristics (water depth, substrate type, geomorphology etc.) generally support different assemblages of biodiversity.

Key inputs into the MPA identification process will include:

- existing scientific information underlying IMCRA v.4.0 (e.g. bathymetry, geomorphic features, distribution of endemic biota);
- additional regional information on habitats, species distribution and ecology gathered during the marine bioregional planning process;
- data on the location and distribution of human activities in the Marine Region;
- views of ocean users and stakeholders in each Marine Region;
- consideration of the contribution that existing spatial management measures can make to the National Representative System of MPAs; and
- consideration of potential management effectiveness (e.g. feasibility of compliance).



Bridled terns and black noddies on Lacepede Island. Photo: Mark Ziembicki.

#### 4.1.1 Goals

Four goals to maximise conservation outcomes will guide the identification of areas suitable for inclusion in the National Representative System of MPAs. These goals apply nationally, and they will be used to guide identification of representative MPAs in all the Marine Regions (except the South-east, where the process has been completed). Additionally, a number of supporting principles will assist in determining the location, selection (when more than one option to meet the goals is available), design and zoning of suitable areas.

**Goal 1** – Each **provincial bioregion** occurring in the Region should be represented at least once in the MPA network. Priority will be given to provincial bioregions not represented in the existing National Representative System.

**Goal 2** – The MPA network should cover all **depth ranges** occurring in the Region, or other gradients in light penetration in waters over the continental shelf.

**Goal 3** – The MPA network should seek to include examples of **benthic/demersal biological features** (e.g. habitats, communities, sub-regional ecosystems, particularly those with high biodiversity value, species richness and endemism) known to occur in the Region at a broad sub-provincial (greater than hundreds of kilometres) scale.

**Goal 4** – The MPA network should include all **types of seafloor** features. There are 21 seafloor types across the entire Exclusive Economic Zone (EEZ). Some provincial bioregions will be characterised by the presence of a certain subset of features, such as continental slope or seamounts.

#### 4.1.2 Guiding principles

##### Location of MPAs

1. MPAs will be located taking into account the occurrence and location of existing spatial management arrangements (e.g. existing protected areas and sectoral measures) that contribute to the goals.

2. The goals should be met with the least number of separate MPAs required to maximise conservation outcomes (i.e. a smaller number of larger MPAs rather than many small MPAs).

##### Selection

3. The capacity of an MPA to mitigate identified threats to conservation values.

4. The occurrence of spatially defined habitats for and/or aggregations of threatened and/or migratory species.

5. The occurrence of ecologically important pelagic features which have a consistent and definable spatial distribution.

6. The occurrence of known small-scale (tens of kilometres) ecosystems associated with the benthic/demersal environment.

7. Relevant available information about small-scale distribution of sediment types and sizes and other geo-oceanographic variables.

8. Occurrence of listed heritage sites (where inclusion in the MPA network would improve administration of protection regimes).

9. Socio-economic costs should be minimised.

##### Design

Once the broad location of MPAs has been determined, the following design principles should be applied to further refine the size and shape of individual MPAs:

10. Individual areas should, as far as practicable, include continuous depth transects, (e.g. from the continental shelf to the abyss).

11. Whole seafloor (geomorphic) features should be included.

12. Features should be replicated wherever possible within the system of MPAs (i.e. included more than once).

13. Size and shape of MPA boundaries should be orientated to account for inclusion of connectivity corridors and biological dispersal patterns within and across MPAs.

14. Boundary lines should be simple, as much as possible following straight latitudinal/longitudinal lines.

15. Boundary lines should be easily identifiable, where possible coinciding with existing regulatory boundaries.



## 4.2 Regional specifications for identifying representative Marine Protected Areas in the North-west Marine Region

In meeting its objectives in establishing a National Representative System of MPAs, the Australian Government is committed to minimising the socio-economic costs involved for both industry and government. All Commonwealth waters support important industries. The North-west Marine Region is of particular importance for the future of Australia's petroleum industry. A key consideration in implementing the goals and principles will therefore be minimising adverse impacts on petroleum exploration and development.

### 4.2.1 Meeting the national goals in the North-west

To achieve the four national goals for the establishment of the National Representative System of MPAs in the Region (as outlined in Section 4.1.1), the following set of regional specifications have been developed, drawing on available biophysical information. Much of this information is available in more detail in this Bioregional Profile or in the associated web-based products.

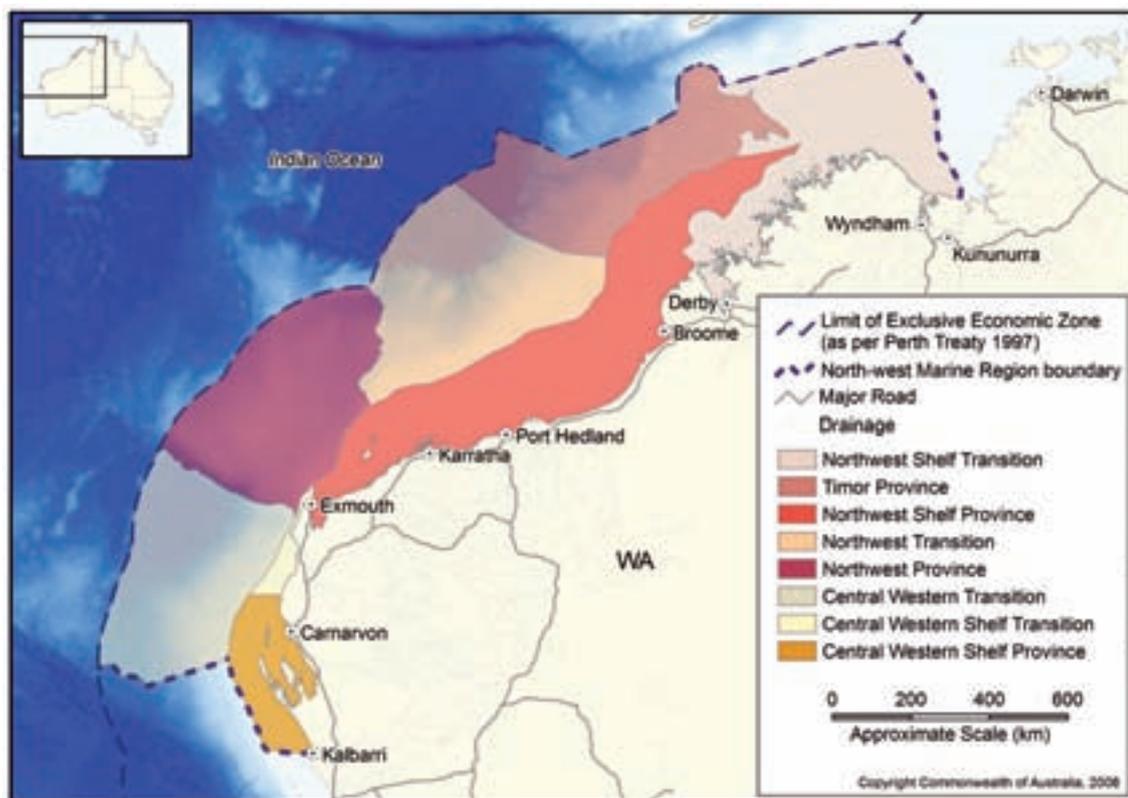
### Specifying Goal 1 – provincial bioregions

The network of representative MPAs in the North-west Marine Region will represent each of the eight bioregions as defined by IMCRA v.4.0 (Figure 4.1). Each provincial bioregion has been identified because it reflects broad-scale patterns of biodiversity and evolution. In identifying new areas for inclusion in the National Representative System of MPAs, priority will be given to areas representative of provincial bioregions with no, or very low levels of representation.

Of these eight provincial bioregions, four are wholly contained within Commonwealth waters in the North-west Marine Region (the Central Western Transition, Northwest Province, Northwest Transition and Timor Province). Three provincial bioregions, the Central Western Shelf Province, Central Western Shelf Transition and Northwest Shelf Province include State waters. The Northwest Shelf Transition straddles both the North and North-west Marine Regions and includes Commonwealth, State and Northern Territory waters (see Table 4.2).

Four MPAs currently exist in the North-west Marine Region: Ashmore Reef National Nature Reserve, Cartier Island Marine Reserve, Mermaid Reef National Nature Reserve and Ningaloo Marine Park. More information on these reserves is available in Chapter 3.

Figure 4.1 Provincial bioregions of the North-west Marine Region (IMCRA v.4.0)



All these reserves are highly protected IUCN reserve categories I and II. The Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve both occur in Timor Province, and Mermaid Reef National Nature Reserve is found in the Northwest Transition. These MPAs are representative of reef ecosystems within these bioregions. However, they are not representative of the provincial bioregions as a whole.

Ningaloo Marine Park (Commonwealth Waters) occurs mostly in the Central Western Shelf Transition, but also covers very small areas (less than one per cent) of three other provincial bioregions: the Central Western Transition, Northwest Province and Northwest Shelf Province. The Ningaloo Marine Park (State and Commonwealth waters) represents reef, continental shelf and slope features and, because of the small number of geomorphic features of this provincial bioregion, could be regarded as representative of the Central Western Shelf Transition.

There are no MPAs in Commonwealth waters in either the Central Western Shelf Province or the Northwest Shelf Transition. In identifying new areas in the Region suitable for inclusion in the National Representative System of MPAs, priority will therefore be given to areas representative of the provincial bioregions not currently represented in MPAs, as detailed in Table 4.1.

The Northwest Shelf Transition provincial bioregion straddles the North-west and North Marine Regions. Identification of MPAs in this bioregion will be determined in conjunction with the North marine bioregional planning process. The North Marine Bioregional Plan is scheduled for completion before the North-west Marine Bioregional Plan.

## Specifying Goal 2 - depth ranges

Depth is one of the main factors determining distribution of benthic and demersal biological communities. Depth reflects certain basic physical variables – such as light penetration, temperature and pressure – that determine what types of animals and plants are found in particular locations. The range of depths that occur in the North-west Marine Region should be represented in the network of representative MPAs. Water depths in the North-west Marine Region range from 0–5895 m (Figure 4.2). However, most of the Region is relatively shallow, with over 40 per cent of its total area in waters less than 200 m deep and over 50 per cent in depths of less than 500 m. This reflects the large areas of continental shelf and slope that occur in the Region.

In comparison with other Marine Regions (except the North Marine Region), the North-west contains a small proportion of deep water. Waters greater than 4000 m deep comprise less than 15 per cent of the Region's waters (Potter *et al.* 2006). The depth range and area of each bioregion in the Region is shown in Table 4.2.

Four of the North-west's provincial bioregions occur only on the continental shelf (Central Western Shelf Province, Central Western Transition, Northwest Shelf Province and Northwest Shelf Transition). These provincial bioregions therefore do not display a marked variation in depth. In some inshore areas in the north of the Region, and particularly in the Joseph Bonaparte Gulf (Northwest Shelf Transition), changes in biota and habitat are associated with gradients in light penetration through the water column. In turbid or nutrient-rich waters,



**Table 4.1 Representation of bioregions in current Marine Protected Areas in the Region**

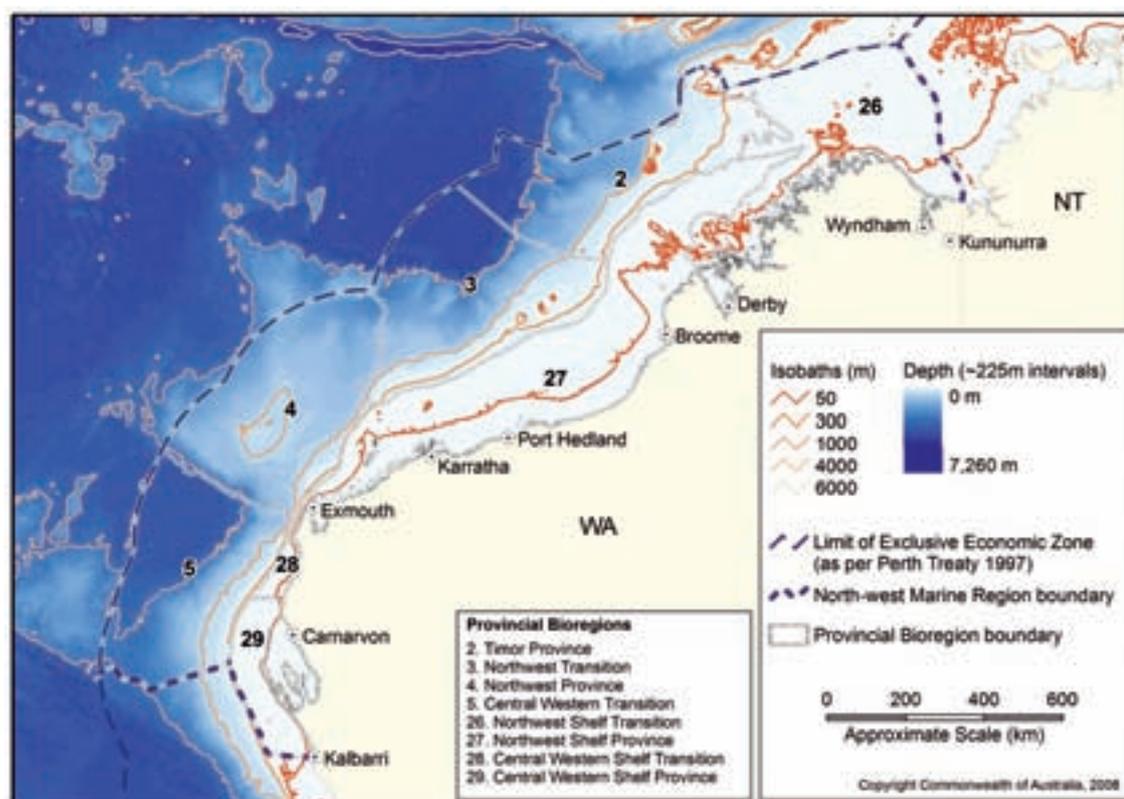
<b>Bioregions well represented by current Marine Protected Areas</b>
<ul style="list-style-type: none"> <li>Central Western Shelf Transition (Ningaloo Marine Park, more than 15 per cent of bioregion)</li> </ul>
<b>Bioregions not currently represented by any current Marine Protected Areas</b>
<ul style="list-style-type: none"> <li>Central Western Shelf Province</li> <li>Northwest Shelf Transition</li> </ul>
<b>Bioregions partially represented by current Marine Protected Areas</b>
<ul style="list-style-type: none"> <li>Timor Province (Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve, less than one per cent of bioregion)</li> <li>Northwest Transition (Mermaid Reef National Nature Reserve, less than one per cent of bioregion)</li> <li>Central Western Transition (Ningaloo Marine Park, less than one per cent of bioregion)</li> <li>Northwest Province (Ningaloo Marine Park, less than one per cent of bioregion)</li> <li>Northwest Shelf Province (Ningaloo Marine Park, less than one per cent of bioregion)</li> </ul>

**Table 4.2** Depth and area of each bioregion in the North-west Marine Region

Bioregion	Total area - km <sup>2</sup> (area within the Region in brackets)	Percentage contained within the Region*	Depth range – m (average depth in brackets)
Central Western Shelf Province	50 516 (32 996)	65.3	0–112 (38)
Central Western Shelf Transition	9698 (7340)	75.7	0–106 (51)
Central Western Transition	162 891 (162 891)	100.0	0–5325 (3036)
Northwest Province	178 651 (178 651)	100.0	20–5133 (1597)
Northwest Shelf Province	238 759 (209 743)	87.8	0–140 (49)
Northwest Shelf Transition	305 463 (136 663)	44.7	0–526 (70)
Northwest Transition	184 424 (183 548)	99.5	0–5895 (2144)
Timor Province	156 669 (155 899)	99.5	0–5819 (2022)
Overall	1 287 070 (1 067 730)	83.0	0–5895

\*This proportion only includes areas in Commonwealth waters, and excludes areas in State waters.

**Figure 4.2** Depth ranges in the North-west Marine Region



suspended and dissolved inorganic and organic matter and living phytoplankton absorb, scatter or reflect light in the upper layers of the water column, shading the lower layers. Coastal run-off during the Northwest Monsoon and mixing of bottom sediments by tide, wind and waves can therefore play an important role in determining the structure and composition of some in-shore benthic and demersal communities. Large proportions of these provincial bioregions are under petroleum leases or are prospective for petroleum.

### Specifying Goal 3 - large-scale biological features

The MPA network in the North-west Marine Region will seek to include examples of known large-scale benthic/demersal biological features (i.e. those associated with the seafloor). However, due to a range of factors, including its remoteness, the marine environment of the North-west is one of the least studied in Australia, and our understanding of the ecological communities and habitats within much of the Region is poor. With the exception of offshore islands and reefs (e.g. the Rowley Shoals, Scott Reef and Ashmore Reef), the North West Shelf and the Ningaloo Reef–Shark Bay area, little is known about the large-scale biological features of the Region. The marine bioregional planning process will provide opportunities to identify gaps in our knowledge and improve our understanding of large-scale biological features that may influence identification of areas suitable for inclusion in the MPA network.

### Specifying Goal 4 - seafloor features

Different biological communities are often associated with different types of seafloor geomorphology. Ensuring that the characteristic features of each provincial bioregion are represented is important in achieving a comprehensive and representative sample of biodiversity within the MPA network. ‘Seafloor features’ here refer specifically to the geomorphic features as defined by IMCRA v.4.0.

The MPA network in the North-west Marine Region will include representative examples of the 19 seafloor features (topographic or geomorphic) that have been identified in the Region (see Figure 4.3).

Some types of geomorphic or topographic features have very few occurrences within individual bioregions, or indeed across the waters of Australia’s EEZ. As a result, the identification of MPAs may be influenced by the location of these features within each bioregion. Over 50 per cent of the banks and shoals, deeps, holes

and valleys found in Commonwealth waters (across Australia’s EEZ) occur in the North-west Marine Region. Most of the banks and shoals in the Region occur in the Northwest Shelf Transition, while the majority of deeps, holes and valleys are found in Northwest Province and Northwest Shelf Province.

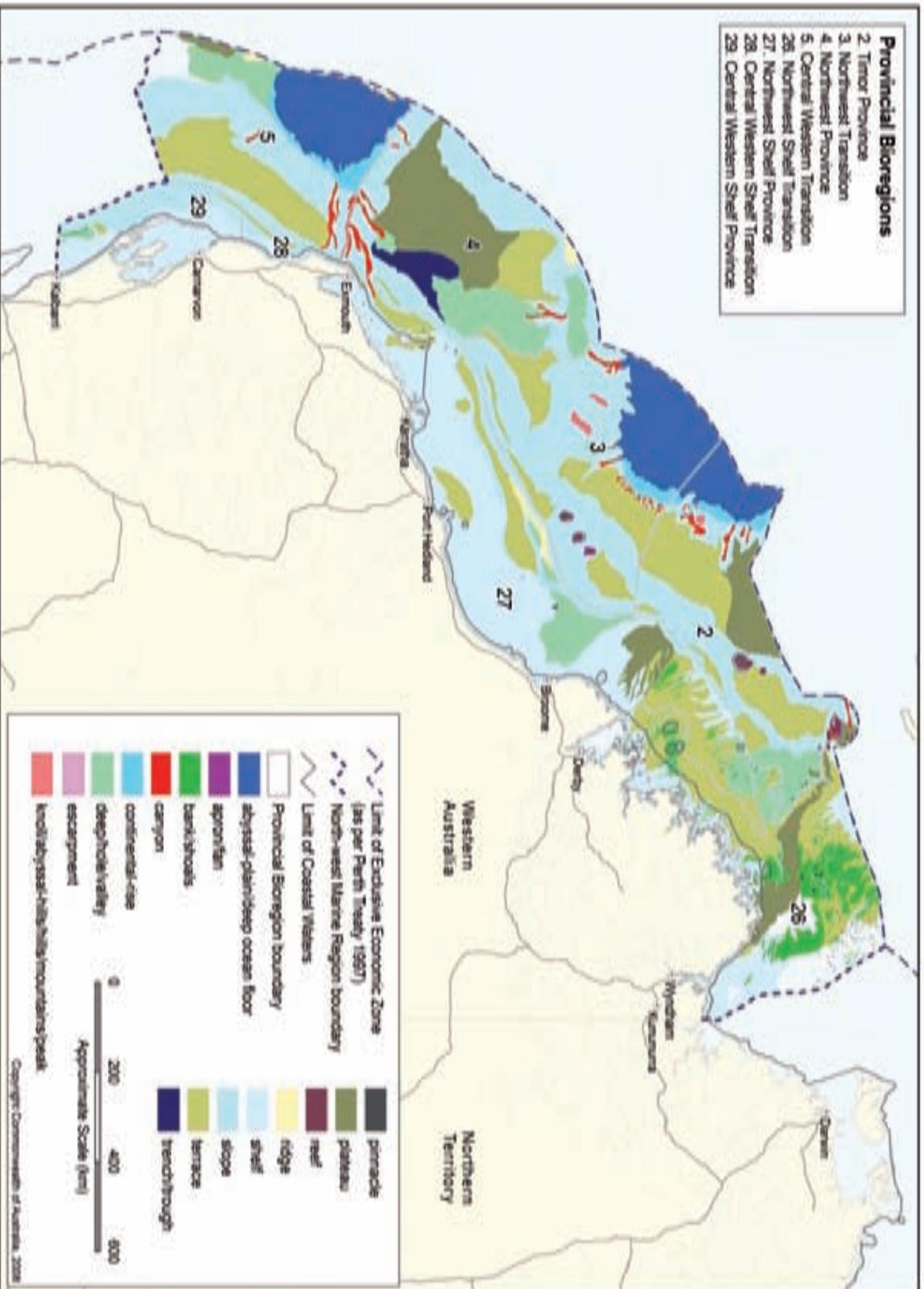
The Region also contains significant areas of terrace, continental slope and tidal sandwave/sand-bank. Areas of terraces and continental slope are well distributed across bioregions off the shelf, while tidal sandwaves/sand-banks are only found in the Northwest Shelf Transition. In addition, seven of the 14 key ecological features identified in Chapter 3 occur around unique seafloor features.



Crinoid at 200 m depth, off Barrow Island. Photo: CSIRO.



Figure 4.3 Geomorphic/sea-floor features of the North-west Marine Region



## 4.2.2 Applying the national principles in the North-west

This section outlines considerations relevant to the regional application of the MPA location, selection, design and zoning principles, as listed in Section 4.1.2. In any given Marine Region there may be different options for MPAs that meet the four goals for the establishment of a representative network. Note that only those principles that require a regional specification (i.e. require input of regionally-specific data) are considered below.

### Location of Marine Protected Areas

In developing options that meet the four goals, the following principles will be applied.

#### Principle 1 - existing spatial management measures

Consistent with the goal, the first step in determining the approximate location of suitable MPAs will be to identify the occurrence, extent and purpose of existing spatial management arrangement (existing MPAs, sectoral management measures, etc) and to assess their capacity to contribute to a representative network in the Region. Spatial management arrangements in the North-west Marine Region and adjacent coastal areas include both temporal and permanent area closures for commercial and recreational fishing, areas managed for conservation objectives and exclusion zones associated with petroleum or communications infrastructure.

#### Principle 2 – small number of large marine parks

While small MPAs can sometimes be justified to protect a particular species, habitat or heritage site, representative MPAs are designed to include examples of many different environments and ecological processes. While no area of ocean, however large, can be said to be truly self-sustaining, larger areas tend to be more resilient.

### Selection

When different options that meet the goals exist, the following selection principles will be considered in selecting areas suitable for inclusion in the National Representative System of MPAs.

#### Principle 3 - threats to the Region's conservation values

Current and future activities may pose a threat to the Region's marine environment and its conservation values. A key function of Marine Bioregional Plans is the identification of potential threats so that decision-makers are aware of long-term implications of these threats for management. An analysis of the threats to the key ecological features and protected species identified in the Region will take place during the next stage of the planning process (see Chapter 3 and Appendices C and D for more detail). Those key ecological features and places of particular importance to protected species that are subject to threat will be considered for inclusion in the proposed network of MPAs, where spatial measures are thought to be the best option for protection.

#### Principle 4 - habitat and aggregation areas of threatened or migratory species

While there are no habitats in the North-west Marine Region listed in the *Register of Critical Habitats* under the EPBC Act, this Bioregional Profile identifies several sites of significance to threatened and migratory species that reside in, or migrate through, the Region. Further details on the habitats and sites used by protected species known to occur in the Region are included in the table of Nationally Protected Species of the Region (Appendix C) and Protected Species Report Cards (Appendix D).

#### Principle 5 - ecologically important pelagic features

Fourteen key ecological features have been identified in the North-west Marine Region (see Chapter 3). Of these, five encompass pelagic environments that are consistent and definable spatial areas. These include Commonwealth waters adjacent to the Rowley Shoals, Ningaloo Reef and Scott and Seringapatam reefs – areas of enhanced biological productivity and high biodiversity. In accordance with Principle 5, these features will be considered in selecting MPAs in those instances where multiple options exist that meet the four national goals. The key ecological features are mapped in Figure 3.1, and details of their values summarised in Table 3.1 (Chapter 3).

#### Principle 6 - small-scale (tens of kilometres) benthic/demersal ecosystems

Ecosystem structure and functioning have been considered and described in this Bioregional Profile at broad regional and bioregional scales. Where available,



data and information on small-scale ecosystems will be considered to explore options for MPAs that meet the four national goals.

Principle 7 - small-scale distribution of sediment types and sizes

Sediment type and grain size strongly influence the species and communities that are found on and near the seafloor. Below the continental shelf in the deeper parts of the Region, our understanding of the relationship between different sediment types and their associated fauna is particularly poor. However, it is reasonable to expect that by including multiple and diverse types of sediments within the MPA network, the diversity of organisms protected will be maximised.

In instances where different options to meet the four national goals exist, data derived from a sedimentology study undertaken in collaboration with Geoscience Australia will be used to assist in the selection of candidate MPAs, with the aim of including areas that cover a broad range of sediment types.

Principle 9 - socio-economic factors

While ensuring that the representative system of MPAs provides significant outcomes for marine biodiversity conservation, the Australian Government is seeking to minimise socio-economic costs associated with displacement of activities or changes in resource access and management that might result from the

establishment of MPAs. The potential impacts on current users will be considered throughout the process, particularly during the selection and design stages.

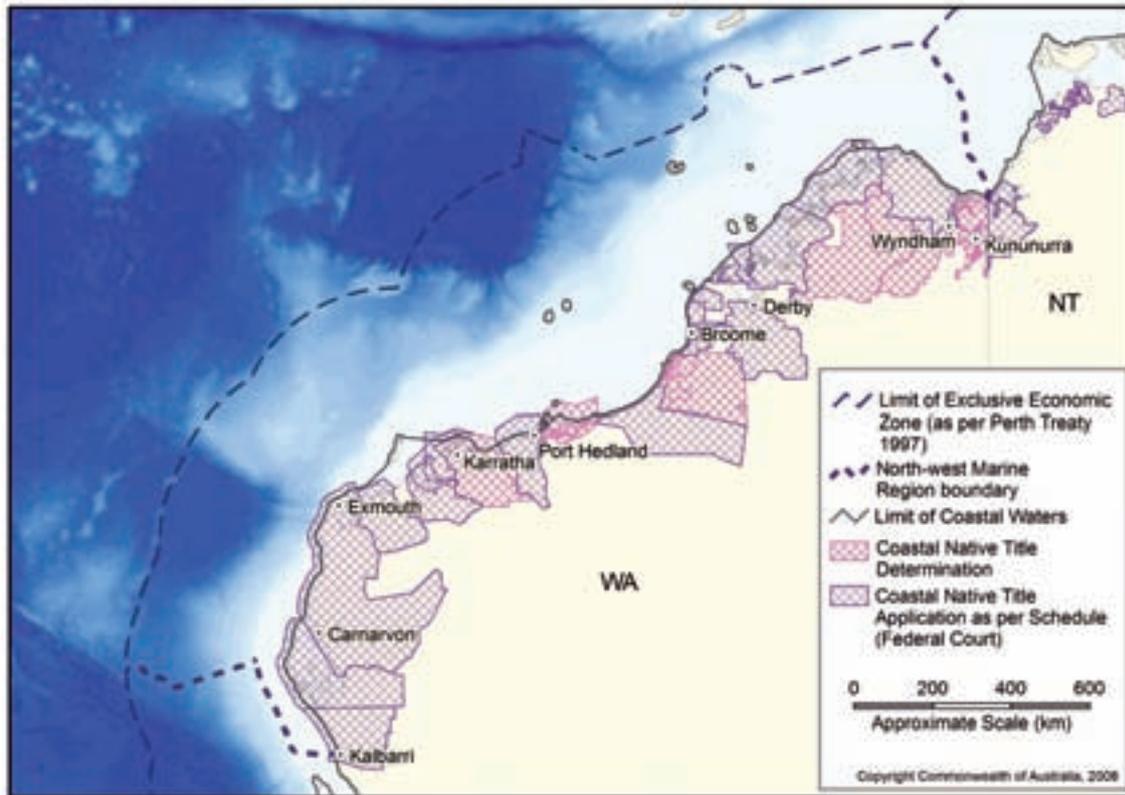
This Bioregional Profile provides summary information about the key commercial and recreational activities that occur in the Region. Reports providing further detailed information on commercial fishing and the expansion of the petroleum and minerals industries in or adjacent to the Region are available on the Department of the Environment, Water, Heritage and the Arts' website <[www.environment.gov.au/coasts/mbp/north-west](http://www.environment.gov.au/coasts/mbp/north-west)>. Further detailed data on the distribution, intensity and value of marine-based industries in the Region will be gathered in consultation with State Government agencies and relevant stakeholders to inform the development of conservation options during the MPA identification process.

Socio-economic aspects of establishing new MPAs will include the consideration of Native Title rights and interests. Coastal Indigenous peoples across Australia consider their sea country to encompass waters from the coastline to the horizon and sometimes beyond (see Appendix B for a description of the native title regime in Australia and Figure 4.4 for information on Native Title applications and determination in and adjacent to the North-west Marine Region). As of December 2007, 16 native title applications and six determinations had been made over sea country in or adjacent to the Region (National Native Title Tribunal 2008).



Nautilus shell, Ashmore Island. Photo: Australian Institute of Marine Science.

Figure 4.4 Native title applications and determinations in and adjacent to the North-west Marine Region



### 4.3 Process for establishing new Commonwealth Marine Reserves in the North-west Marine Region

The identification of new MPAs in the North-west Marine Region will occur during the next stages of the marine bioregional planning process and will comprise the steps outlined below.

**Step 1** – A proposed MPA network will be developed by the Department of the Environment, Water, Heritage and the Arts in accordance with the national goals and principles and regional specifications, as outlined in Section 4.2. During this time, stakeholders will be consulted by the Department. Stakeholder participation will ensure that the Department has accurate and comprehensive details of the current uses and interests in the Region. This will help ensure that the potential impacts of proposed MPAs on current users of the Region are well understood and minimised. The Department will also seek expert scientific advice to ensure the proposed network is underpinned by relevant and current data and best available knowledge.

**Step 2** – The proposed MPA network will be agreed by Government for release in a Draft Plan for a three-month period of statutory public consultation. During this time,

the Department will make all relevant data available and will facilitate information sessions to assist members of the public who wish to make representations to the Government in relation to the proposed MPA network or other aspects of the Draft North-west Marine Bioregional Plan.

**Step 3** – After consideration of public submissions, advice from the Department, and agreement by the Government, the Final Plan will be released. It will contain a network of candidate MPAs to be declared as designated marine reserves. Marine reserves will be declared in accordance with the relevant sections of Part 15 of the EPBC Act.

Chapter 6 provides further information about how the marine bioregional planning process (including identification of MPAs) will unfold in the North-west Marine Region following the release of this Bioregional Profile.

## Key references and further reading

Australian and New Zealand Environment and Conservation Council (ANZECC), Task Force on Marine Protected Areas, 1998, *Guidelines for Establishing the National Representative System of Marine Protected Areas*, Environment Australia, Canberra, <[www.environment.gov.au/coasts/mpa/publications/nrsmmpa-guidelines.html](http://www.environment.gov.au/coasts/mpa/publications/nrsmmpa-guidelines.html)>, accessed 2/11/2007.

Department of the Environment and Heritage (DEH), 2006, *A Guide to the Integrated Marine and Coastal Regionalisation of Australia Version 4.0*, Commonwealth of Australia, Canberra, <[www.environment.gov.au/coasts/mbp/publications/imcra/imcra-4.html](http://www.environment.gov.au/coasts/mbp/publications/imcra/imcra-4.html)>, accessed 2/11/2007.

Department of the Environment, Water, Heritage and the Arts (DEWHA), 2007, *National Representative System of Marine Protected Areas*, Commonwealth of Australia, Canberra, <[www.environment.gov.au/coasts/mpa/nrsmmpa](http://www.environment.gov.au/coasts/mpa/nrsmmpa)>, accessed 2/11/2007.

National Native Title Tribunal, 2008, <[www.nntt.gov.au](http://www.nntt.gov.au)>, accessed 23/03/2008.

Potter, A., Baker, C., Tran, M. & Heap A.D., 2006, *Sedimentology and Geomorphology of the North-west Marine Region of Australia*, Geoscience Australia, Canberra.

World Conservation Union, 1994, *Guidelines for Protected Area Management Categories*, IUCN, <[www.iucn.org/themes/wcpa/pubs/guidelines.htm](http://www.iucn.org/themes/wcpa/pubs/guidelines.htm)>, accessed 30/10/2007.

### Legislation

Available from the Commonwealth of Australia Law website <[www.comlaw.gov.au](http://www.comlaw.gov.au)>.

*Environment Protection and Biodiversity Conservation Act 1999*

*Native Title Act 1993*

### Map data

#### Figure 4.1 Provincial bioregions of the North-west Marine Region (IMCRA v.4.0)

Australian Bureau of Statistics (1991): Australia, Populated Places

Department of the Environment, Water, Heritage and the Arts (2006):

Commonwealth Marine Planning Regions

Department of the Environment, Water, Heritage and the Arts (2006):

Integrated Marine and Coastal Regionalisation of Australia v4.0 - Provincial Bioregions

ESRI Australia Pty Ltd (Canberra) (2001): ARCWORLD Map of the World 1:20 million

Geoscience Australia (1998): Australia, TOPO-2.5M Topographic Data – Coast and State Borders

Geoscience Australia (2003): Australia, TOPO-2.5M Topographic Data – Drainage and Roads

Geoscience Australia (2005): Australian Bathymetry and Topography

Geoscience Australia (2006): Australian Maritime Boundaries (AMB) v2.0

Projection: Geographics, Datum: GDA94

Produced by the Environmental Resources Information Network (ERIN)

Australian Government Department of the Environment, Water, Heritage and the Arts

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#### Figure 4.2 Depth ranges in the North-west Marine Region

Australian Bureau of Statistics (1991): Australia, Populated Places

Department of the Environment, Water, Heritage and the Arts (2006):

Commonwealth Marine Planning Regions

Department of the Environment, Water, Heritage and the Arts (2006):

Integrated Marine and Coastal Regionalisation of Australia v4.0 - Provincial Bioregions

ESRI Australia Pty Ltd (Canberra) (2001): ARCWORLD Map of the World 1:20 million

Geoscience Australia (1998): Australia, TOPO-2.5M Topographic Data - Coast and State Borders

Geoscience Australia (2005): Australian Bathymetry and Topography

Geoscience Australia (2006): Australian Maritime Boundaries (AMB) v2.0

Projection: Geographics, Datum: GDA94

Produced by the Environmental Resources Information Network (ERIN)

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#### Figure 4.3 Geomorphic/seafloor features of the North-west Marine Region

Australian Bureau of Statistics (1991): Australia, Populated Places

Department of the Environment, Water, Heritage and the Arts (2006):

Commonwealth Marine Planning Regions

Department of the Environment, Water, Heritage and the Arts (2006):

Integrated Marine and Coastal Regionalisation of Australia v4.0 - Provincial Bioregions

ESRI Australia Pty Ltd (Canberra) (2001): ARCWORLD Map of the World 1:20 million  
 Geoscience Australia (1998): Australia, TOPO-2.5M Topographic Data - Coast and State Borders  
 Geoscience Australia (2003): Australia, TOPO-2.5M Topographic Data – Drainage and Roads  
 Geoscience Australia (2004): Geomorphic Features of Australia's EEZ  
 Geoscience Australia (2005): Australian Bathymetry and Topography  
 Geoscience Australia (2006): Australian Maritime Boundaries (AMB) v2.0  
 Projection: Geographics, Datum: GDA94  
 Produced by the Environmental Resources Information Network (ERIN)  
 Australian Government Department of the Environment, Water, Heritage and the Arts  
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**Figure 4.4 Native title applications and determinations in and adjacent to the North-west Marine Region**

Australian Bureau of Statistics (1991): Australia, Populated Places  
 Department of the Environment, Water, Heritage and the Arts (2006):  
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 Produced by the Environmental Resources Information Network (ERIN)  
 Australian Government Department of the Environment, Water, Heritage and the Arts  
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