Lessons from implementation of Ecosystem-based management of ocean uses in Australia

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Overview

1. **Australian context**
2. **Three Case Studies**
   1. Great Barrier Reef Marine Park
   2. Regional Marine Planning – the SE experience
   3. The transition to Ecosystem-Based Fisheries Management
3. **Some general observations**

Australian Context

Ecosystem-based management

• Is a means to achieving the goal of ecologically sustainable development

Elements include:

•Ecological boundaries (rather than jurisdictional)

•Maintenance of ecosystem structure and function

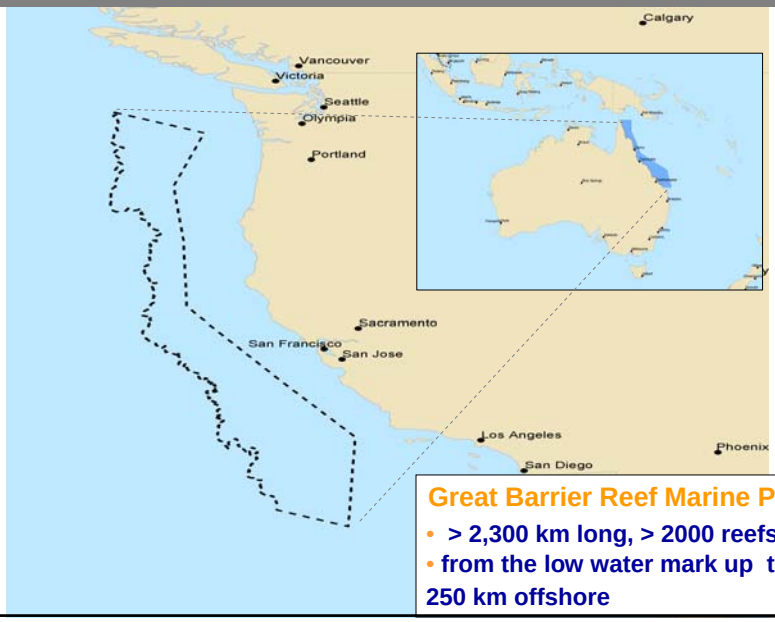
•Adaptive management

•Application of the precautionary approach in the face of uncertainty

•National System of Representative Marine Protected Areas (NSRMPA) a central component

•Stakeholder participation

Great Barrier Reef Marine Park

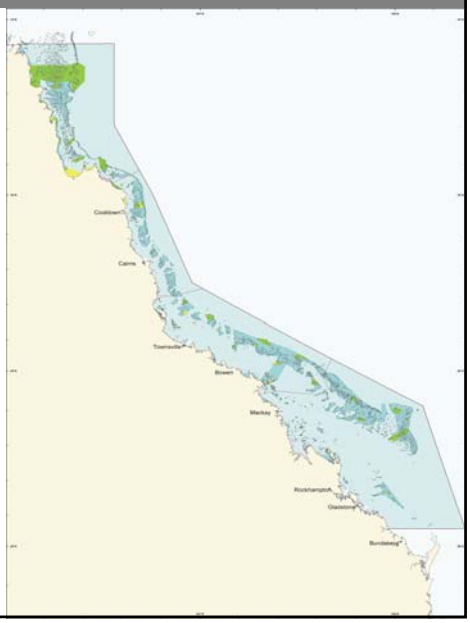


Great Barrier Reef Marine Park

- **> 2,300 km long, > 2000 reefs**
- **from the low water mark up to 250 km offshore**

Great Barrier Reef Marine Park

- **Established 1982 under federal legislation (GBRMP Act)**
- **Binding agreement with regional government (QLD) for day to day management**
- **Conservation of the GBR and sustainable use**
- **Spatial zoning and "permitted use" as principle multiple use management tools**
- **Regional management plans to reflect large-scale differences in ecology of system**
- **The concept of adaptive management explicit from outset (5-7 yr review cycle)**
- **Long history of stakeholder participation in establishment and planning and management**



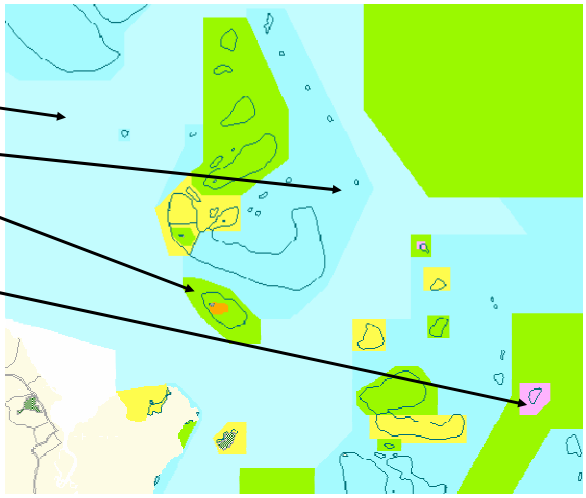
Great Barrier Reef Marine Park

Spatial zoning a key management tool

Zones separate conflicting uses:

- **General use**
- **Habitat Protection**
- **Marine National Park ('no-take')**
- **Preservation ('no- go')**

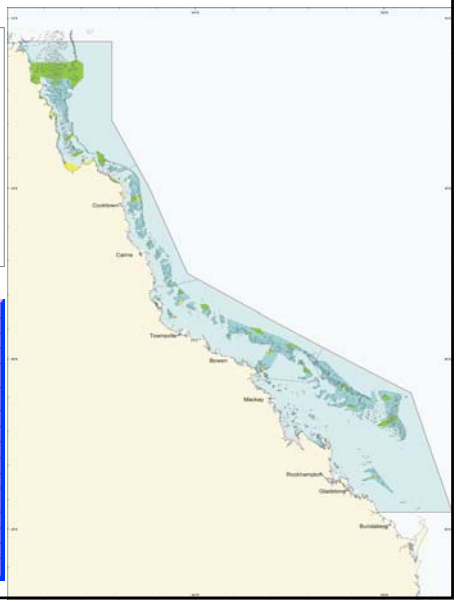
- **Activities in each zone specified as:**
  - ***"as of right"; or***
  - ***require a permit.***
- ***Otherwise prohibited.***



Great Barrier Reef Marine Park – early 1990's

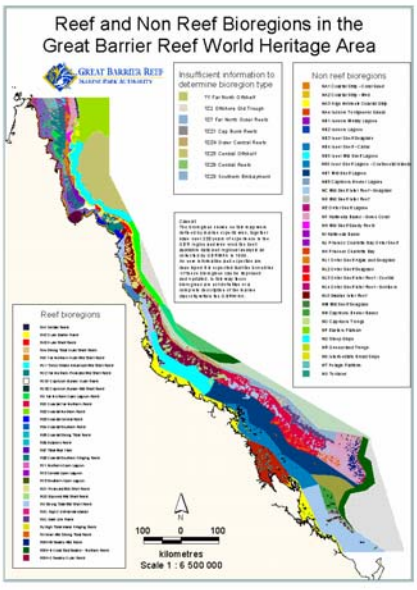
***Preservation Zone** (‘no go’)*	0.1%
***Marine Nat Park** (‘no take’)*	4.6%
Scientific Research	0.01%
***Buffer Zone** (trolling only)*	0.1%
***Conserv Park** (limited fishing)*	0.6%
***Habitat Protection** (no trawling)*	15.2%
***General Use** (reasonable use)*	77.9%

Aquaculture	Permit	Permit	Permit [1]	✗	✗	✗	✗
Bait netting	✓	✓	✓	✗	✗	✗	✗
Boating, diving, photography	✓	✓	✓	✓	✓ [2]	✓	✗
Crabbing (trapping)	✓	✓	✓ [3]	✗	✗	✗	✗
Harvest fishing for aquarium fish, coral and beachworm	Permit	Permit	Permit [1]	✗	✗	✗	✗
Harvest fishing for sea cucumber, trochus, tropical rock lobster	Permit	Permit	✗	✗	✗	✗	✗
Limited collecting	✓ [4]	✓ [4]	✓ [4]	✗	✗	✗	✗
Limited spearfishing (snorkel only)	✓	✓	✓ [1]	✗	✗	✗	✗
Line fishing	✓ [5]	✓ [5]	✓ [6]	✗	✗	✗	✗
Netting (other than bait netting)	✓	✓	✗	✗	✗	✗	✗
Research (other than limited impact research)	Permit	Permit	Permit	Permit	Permit	Permit	Permit
Shipping (other than in a designated shipping area)	✓	Permit	Permit	Permit	Permit	Permit	✗
Tourism program	Permit	Permit	Permit	Permit	Permit	Permit	✗
Traditional use of marine resources	✓ [7]	✓ [7]	✓ [7]	✓ [7]	✓ [7]	✓ [7]	✗
Trawling	✓	✗	✗	✗	✗	✗	✗
Trolling	✓ [5]	✓ [5]	✓ [5]	✓ [5,8]	✗	✗	✗



Great Barrier Reef Marine Park – Representative Areas Program (RAP)

- **Initial zoning based on limited information and best available science at time**
- **Aim to represent all bioregions in fully protected MPAs**
- **70 bioregions (30 reef, 40 non-reef) identified from combination of analysis and expert opinion**



Great Barrier Reef Marine Park – Representative Areas Program (RAP)

Biophysical Operating Principles

1. **Minimum size 20km across if possible**
2. **The larger, the better**
3. **Replicate no-take areas within bioregions to reduce risk**
4. **Don't 'split-zone' reefs if possible**
5 **Minimum of at least 20% per bioregion *(reef) and (non-reef).***
6 **Consider cross-shelf & latitudinal diversity**
8. **Include examples of all community types & physical environments**
9. **Consider connectivity**
10. **Consider special & unique sites/locations**
11. **Consider adjacent uses**

Social, Economic, Cultural & Management Operating Principles

1. **Maximise complementarity with adjacent areas**
2. **Recognise social benefits / costs**
2. **Complement existing & future management**
3. **Maximise public understanding & enforceability**

Great Barrier Reef Marine Park – 2004

Increased protection of the entire Marine Park, providing a framework for conservation and sustainable use of the GBR.

Over 33% (>117,000 sq km) in highly protected 'no-take' zones *(noting the entire GBRMP is protected)*

Creation of a new network of 'no-take' zones representative of all 70 bioregions *(at least 20% of every bioregion)*

Assistance to fisheries (trawl, line, collection) and coastal communities to minimise social impact and improve economic performance

Forward program focussed on land-based inputs, EBM fisheries and threats of global climate change

Australia's Oceans Policy

Integrated, ecosystem-based management of oceans

Amendments to primary environment legislation resulting in the *Environment Protection and Biodiversity Conservation Act 1999* provide for strategic assessment of potential impacts of activities

Key initiatives

- **Marine Bioregional Plans**
- **National System of Representative Marine Protected Areas (NSRMPA)**
- **Strategic Assessments of Fisheries against ecological sustainability criteria**

Bioregional Marine Plans

Identification/description of regional conservation values

Regional assessment of risks from existing and emerging pressures

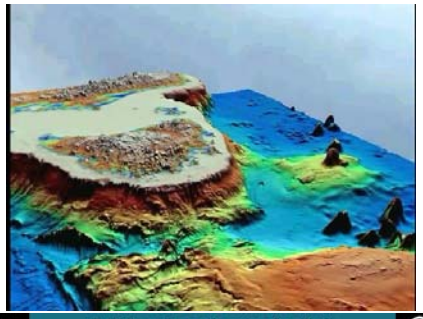
Integrated conservation strategies

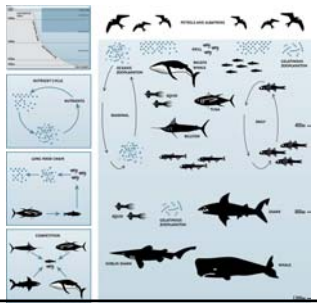
- Network of candidate MPAs
- Other measures (statutory and non)
- Guidelines/operational policies

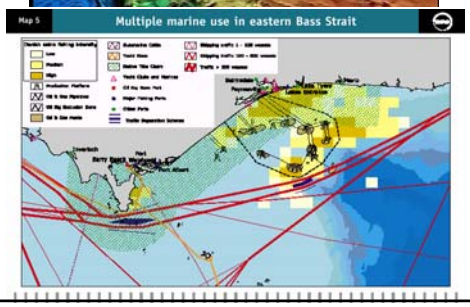
Indicators for monitoring state of marine environment and assessing performance of conservation measures

South East Regional Marine Plan

- 2.1 Million sq km
- Major shipping routes, oil and gas, fisheries, undersea infrastructure, tourism
- Significant conservation values, including unique communities, endemic species and threatened and endangered species
- 1st regional marine planning exercise





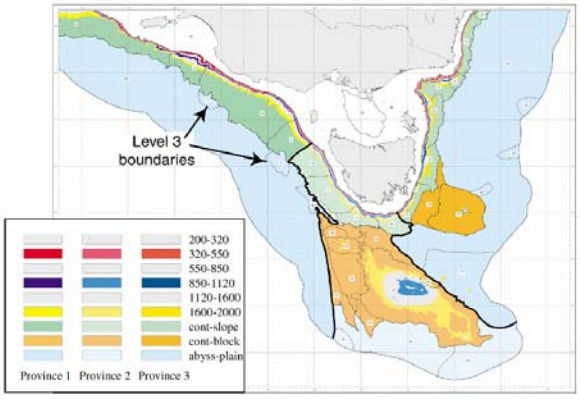


Interim SE Marine Bioregionalisation

Based on:
- Biogeography of selected fish species
- Bathymetry
- Paleogeology

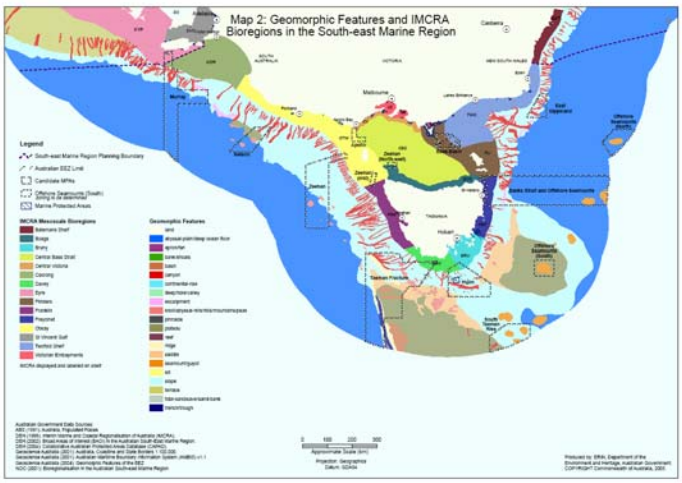
Three levels of biodoversity:
-Provinces
-Biomes
-Geomorphological features

Key uncertainties and information needs identified and addressed in subsequent national regionalisations



South East Regional Marine Plan

- Broad Areas of Interest for MPA siting identified based on representative criteria for biodiversity at provincial and biomic levels
- Geomorphology used to define initial boundaries and as surrogate for biodiversity



SE Region representative system of Marine Protected Areas

SE Representative system of MPAs declared on 5 May 2006

13 MPAs in system with a total area of 226 155 kms

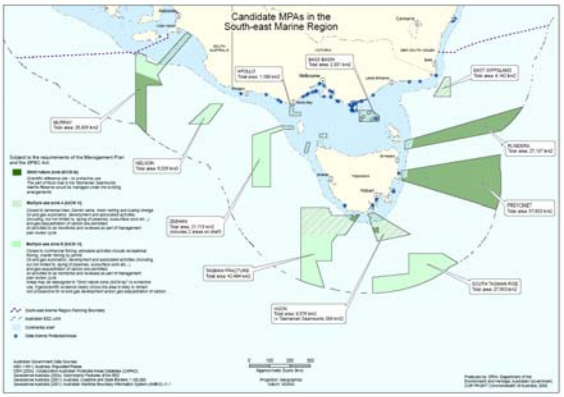
8% of continental shelf

26% of the continental slope

18% of deep ocean (abyssal plain)

Coverage of 6 provincial bioregions

Range of zoning within and cross individual MPAs from strict nature reserves (no extractive use) to multiple-use (some forms of fishing allowed)



National Marine Bioregionalisation - Spatial planning framework for EBM

Benthic bioregionalisation

-**Provinces** (46)

-Centre of endemism

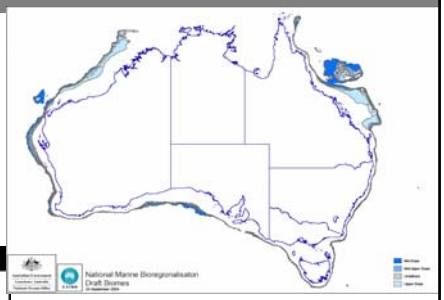
-Transitional communities

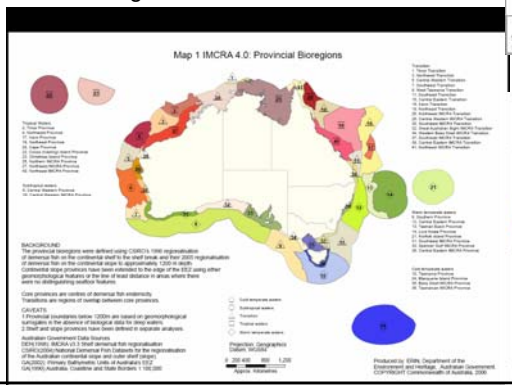
-**Biomes**

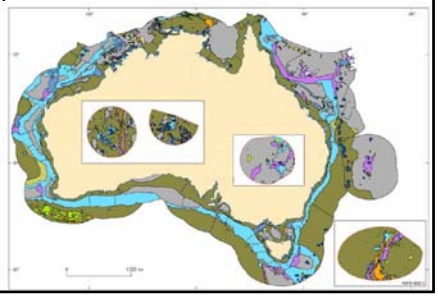
-shelf to abyss depth structure

-**Biogeomorphological units**

-Large-scale features







National Marine Bioregionalisation - Spatial planning framework for EBM

Pelagic regionalisation

3D regionalisation of water masses

Based on:

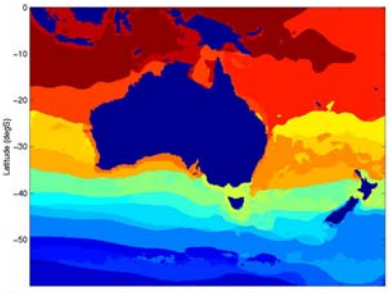
-Physical ocean properties

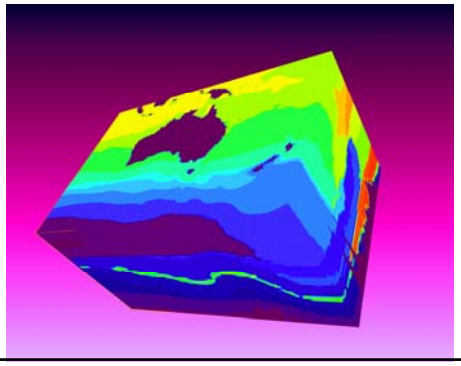
-Primary production

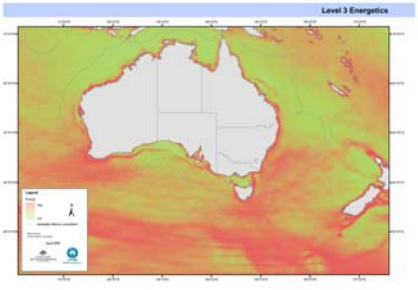
-Phytoplankton community structure

Multi-levels (water masses to features)

Need to test surrogacy assumptions







Transition to EBFM - Strategic Assessments of Fisheries

Under EPBC Act commercial fishing is consider trade in native wildlife

All Commonwealth fisheries, and state fisheries that export product, are required to undertake a strategic assessment against specific criteria to determine whether the fishery is ecologically sustainable

The assessment is based on fisheries management plans for each fishery, which are prepared by the fishery management authority, for approval by the Minister for Environment.

There are two classes of approval:

- Exemption: Exempt from provisions of the Act with 5 year review of operation of the fishery against assessment criteria
- Permit: Permit to export is approved with conditions requiring improvement in specific aspects of the fisheries operation to meet assessment criteria within a specified period (generally 1-2 years)

Transition to EBFM – ecological risk assessment of affects of fishing

Developed in partnership with fisheries and environment agencies and stakeholders

Designed to provide consistent method for ecological risk assessment for strategic assessment of ecological impacts of fisheries

Formally recognised by fisheries and environment agencies for use in strategic assessment

Provides for stakeholder input and expert opinion

Is explicitly risk averse in the face of uncertainty (lack of information on potential impacts results in risk avoidance)

Provides a formal framework in which to assess the value of information

Transition to EBFM - ecological risk assessment of affects of fishing

Risk from what to what?

The risk that fishing activities pose to achievement of (environmental) management objectives relevant to each component of the ecosystem

Comprehensive list of "activities" considered

5 ecological components evaluated

- Target species
- Byproduct and Bycatch species
- Threatened, Endangered and Protected species (TEP)
- Habitats
- Communities (including food chains)

Transition to EBFM - ecological risk assessment of affects of fishing

Hierarchical approach with three levels of assessment that allows screening & elimination of low risk and cost-effectiveness

Initial scoping (whole fishery, all issues)

Level 1 – qualitative risk assessment

Level 2 – semi-quantitative risk assessment

Level 3 – full quantitative risk assessment

Proceed to subsequent level depending on:

•Estimated risk at current level

•Management response at current level (avoid, mitigate)

•Document rationale and decisions at each level

Transition to EBFM - Structural adjustment of over-fished fisheries

In December 2005, the Australian Government launched "Securing our fishing future" a whole of government response to high proportion of over-fished fisheries and slow rate of recovery of those classified as over fished

Explicitly linked to a transition to ecosystem-based fisheries management

Measures include:

-**Structural adjustment of major federal fisheries to improve economic efficiency and benefit to Australian Community**

-**In the case of the SE region, the adjustment process is integrated with declaration of SE representative marine protected areas system**

-**Mandatory development and implementation of harvest strategies, including target and limit reference points, decision rules, assessment and monitoring systems**

-**Formal evaluation of the robustness of harvest strategies to uncertainty using the management strategy evaluation approach**

- **Development and implementation of spatial management measures to minimise environmental impacts of fishing**

-**Requirement to reduce bycatch in all federal fisheries by 50%**

Short-term implementation schedule with medium term review of measures

Some general observations

•Significant **progress** towards EBM has been made **in the face of uncertainty** of biodiversity and ecosystem processes

•This has been facilitated by policy makers, managers, scientists and stakeholders **willingness to commit to action** based on well founded principles and acknowledgement of the adaptive nature of the process.

•Possible to develop **ecological spatial frameworks and risk assessments** for planning and management on the basis of best available scientific advice, which are revised as new information becomes available

•**Representative MPAs** are an **integral tool for conserving ecosystem level biodiversity**

•**Strong enabling legislation** has been instrumental in the rate of progress

•The concept of **marine activities as "permitted use"** of the marine environment has provided a basis for proactive, strategic management for conservation and sustainable use outcomes

•**Objectives achieved through sectoral management** in conjunction with **periodic strategic review**