



Regulatory approaches to fisheries
management

- Australian federal approaches and recent
issues

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Regulatory approaches to fisheries management

- Australian federal approaches and recent issues

Outline

- Legislative and institutional arrangements
- 'Day to day' management of Australian federal fisheries
- Approaches to assessment and management
- Conclusions



Australian federal approaches to fisheries management - Legislative and institutional arrangements

Four institutional elements, all guided by the objectives of Ecologically Sustainable Development (ESD)

1. Australian Fisheries Management Authority (AFMA)

- Administratively structured as a Fisheries Commission
- Responsible for 'Day to day' fisheries management
- Implements the Fisheries Management Act & Fisheries Administration Act

2. Department of Agriculture, Fisheries and Forestry (DAFF)

- Responsible for international fisheries negotiation
- Responsible for domestic fisheries policy
- Reviews AFMA performance against fishery policy (annual status reports)

3. Department of Environment, Water Heritage and the Arts (DEWHA)

- Environmental oversight
- Implementing the Environment Protection and Biodiversity Conservation Act

4. Australian National Audit Office (ANOA)

- Implementation of all Acts, policies and responsibilities (about 5yearly reviews)



Australian federal approaches to fisheries management - Legislative and institutional arrangements

Environment Protection and Biodiversity Conservation (EPBC) Act gives the DEWAH responsibility to:

- identify and manage Threatened, Endangered and Protected species
- identify and manage a National Representative System of Marine Protected Areas
 - Including through Marine Bio Regional Plans
 - MPAs primarily for regional biodiversity management, not fishery management
- require Ministerial approval for all federal fisheries and any export of native seafood against guidelines for ecological sustainability
- require Ministerial approval for any development that could have a 'significant impact' on the marine environment
 - identify 'conservation values of national significance'



Australian federal approaches to fisheries management - Legislative and institutional arrangements

AFMAs objectives under the Fisheries Management Act

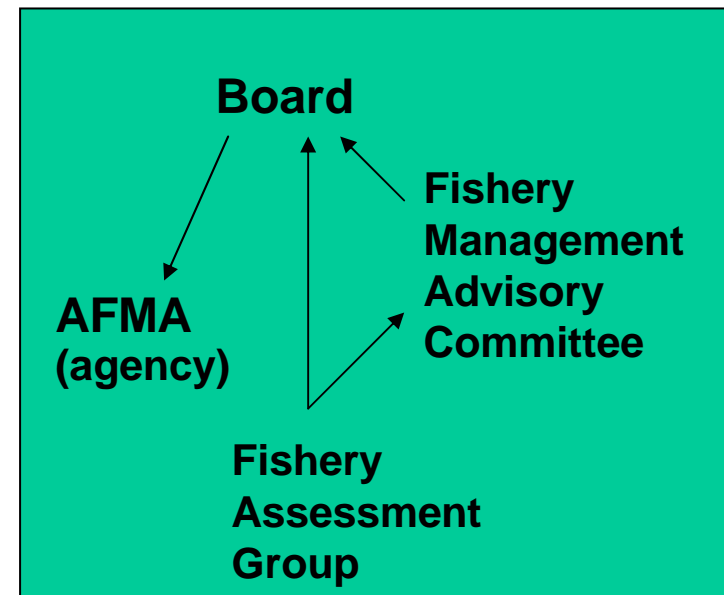
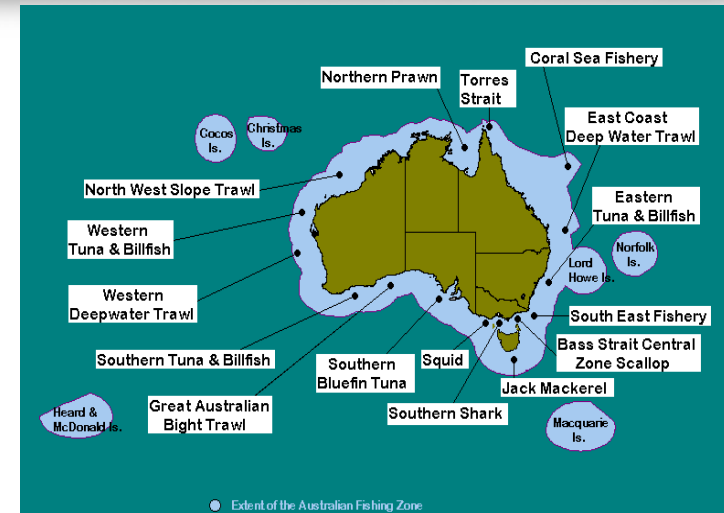
1. Efficient and cost-effective fisheries management and administration
2. Apply the principles of ESD
 - i. Integrate long and short term economic, environmental, social and equity considerations
 - ii. Precaution; management measure to prevent serious or irreversible environmental damage should not be postponed through lack of scientific certainty
 - iii. Maintain inter-generational equity
 - iv. Maintaining biodiversity and ecological integrity are fundamental considerations
 - v. Promote and use improved valuation, pricing and incentives
3. Maximise the economic return to the Australian community
 - Economic efficiency; obtain benefits with minimum input costs
4. Accountability to industry and Australian community
5. Apply cost recovery policy



Australian federal approaches to fisheries management

- 'Day to day' management fisheries

- **Australian Fisheries Management Authority**
 - 'arms length' from politics
- **Expertise based Commissioners**
 - expertise in fishing industry (no direct interest), natural resource management, marine science, business
- **A partnership and approach**
 - industry, scientific, conservation, and recreational fishing interests on advisory groups & committees
- **Science provided independently from the agency and reported directly to Board**
- **Rights based input and/or output controls used throughout (i.e. statutory fishing rights)**
 - SBT, about 85% of SE fisheries, GAB, Western tuna & billfish, and southern ocean fisheries under ITQs





Australian federal approaches to fisheries management

- Approaches to assessment and management

Key experiences with ITQs

Southern Bluefin Tuna (introduced late 1980s)

- A rapid rationalisation of the fishery across State boundaries and an outcome within domestic fishery management that would likely not have been possible.
- Since then there has been little progress in recovering the stock through international arrangements.

SE group of fisheries (introduced early 1990s)

- Loopholes relating to discards, 'non-binding' TACs and overcapacity when ITQs introduced resulted in largely ineffective quota trading
- continued and worsening economic and environmental performance
- The problems with this fishery were a major reason for the recent changes in management approach.

Great Australian Bight (introduced 2001) and southern ocean fisheries

- Developing fisheries with few 'players' when ITQs introduces
- Very effective and cooperative identification of fishery development plans and options
- The success stories in my view

The devil is in the detail of the 'ITQ rules', autonomous adjustment often needs help (i.e. the effects of 'sunk capital' and inflexible investments with low profitability) at key times



Australian federal approaches to fisheries management

- Approaches to assessment and management

Major changes in the last about 5y, and especially the last 3y

- Increasingly rigorous environmental assessments
- Increased clarity about economic and environmental performance
- Clarifications to operational intention made by a Ministerial Direction and changes to the Fisheries Management Act



Australian federal approaches to fisheries management - Approaches to assessment and management

Statutory changes introduced in 2005 required:

- harvest policies (decision rules) for target species
 - and provided reference points and probabilities
 - elimination of overfishing and faster recovery of overfished stocks
 - reduction of by-catch, including accounting for discards of target species
 - better management of ecosystem impacts: sustainable by-catch; risk assessment for habitats and trophic dependencies
 - satellite vessel monitoring systems
 - independent monitoring of fishing
 - fishery independent surveys
-
- provided \$220m for restructuring the fishery
 - capacity more aligned with economic and ecological goals
 - about 30-40% capacity brought out
 - social justification a strong expectation of social benefits



Australian federal approaches to fisheries management - Approaches to assessment and management

Minimum requirements of harvest strategies

- B_{lim} greater than or equal $\frac{1}{2} B_{msy}$ or proxy $0.2 B_0$
- F_{lim} less than or equal F_{msy}
- **Target B is B_{mey}** , with B_{msy} being an interim rebuilding target
- **Target F is F_{mey}** , with F_{msy} potentially an interim rebuilding target
- Proxy for B_{msy} is $0.4B_0$
- **Proxy for B_{mey} is $1.2 B_{msy}$**
- Probability of being above B_{lim} at least 0.9 per generation time
- Can vary reference points if biological circumstances mean the defaults give higher than acceptable risk to the stock
- Can use alternative, equivalent proxies

Stocks between B_{lim} and $0.75 B_{lim}$ may be listed as Conservation Dependent under EPBC meaning the fishery recovery plan requires approval by the Environment Minister

Stocks below $0.75 B_{lim}$ may be listed as threatened or endangered under EPBC meaning a population recovery plan will be developed by the Environment Minister



Australian federal approaches to fisheries management - Approaches to assessment and management

The responses being implemented:

- **Ecological Risk Assessment**
 - Screening of many species to identify those of high risk
 - Link to risk management response and prioritised R&D
 - Applied to 14 fisheries, 25 sub-fisheries and over 3160 taxa and 2500 species
- **Harvest strategies**
 - Retained species
 - Use of coupled biophysical-bioeconomic models to evaluate broad management strategies and harvest strategies (catch control rules)
- **Spatial management**
 - Increasingly recognised as a cost-effective management approach to some situations
- **More widespread application of ITQs**
 - Northern prawn fishery – highly variable and short lived spp
 - Eastern tuna and billfish – part of an internationally managed fishery

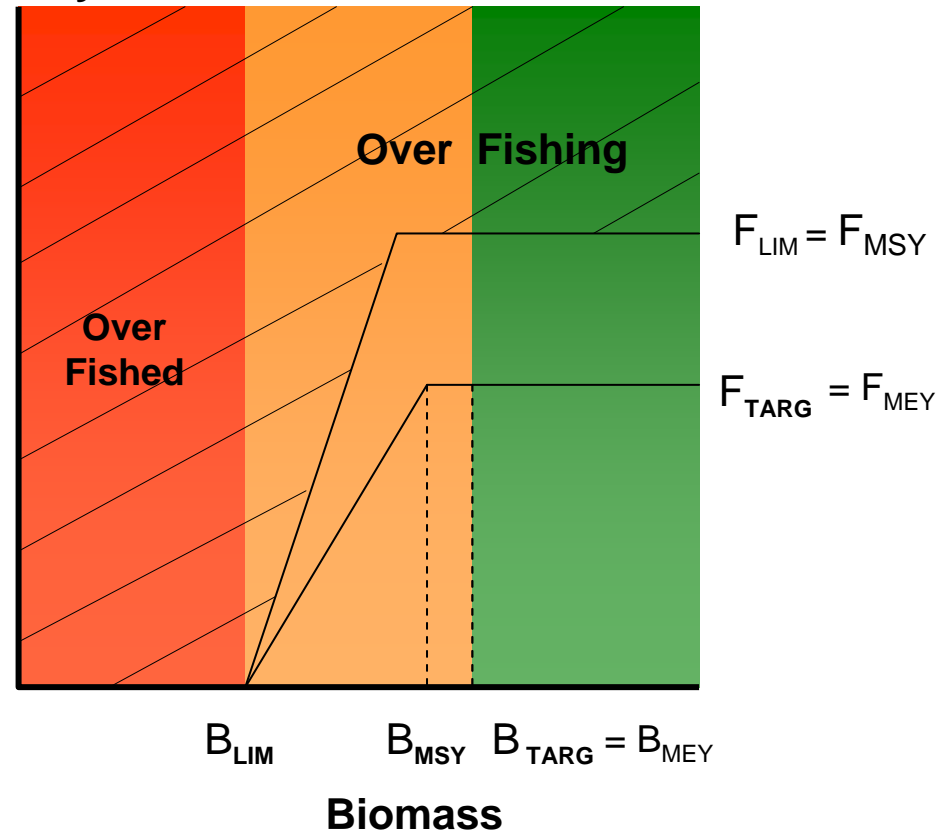


Australian federal approaches to fisheries management

- Harvest strategies with stock assessments

- Maximum and target exploitation rate
- Minimum biomass level
- Catches reduce below the target biomass
- Targeted catches go to zero at the biomass limit
- Rebuilding from below B_{LIM} is to B_{MSY}
- Flexibility otherwise, including how to get to B_{MEY} from B_{MSY}

Fishing mortality

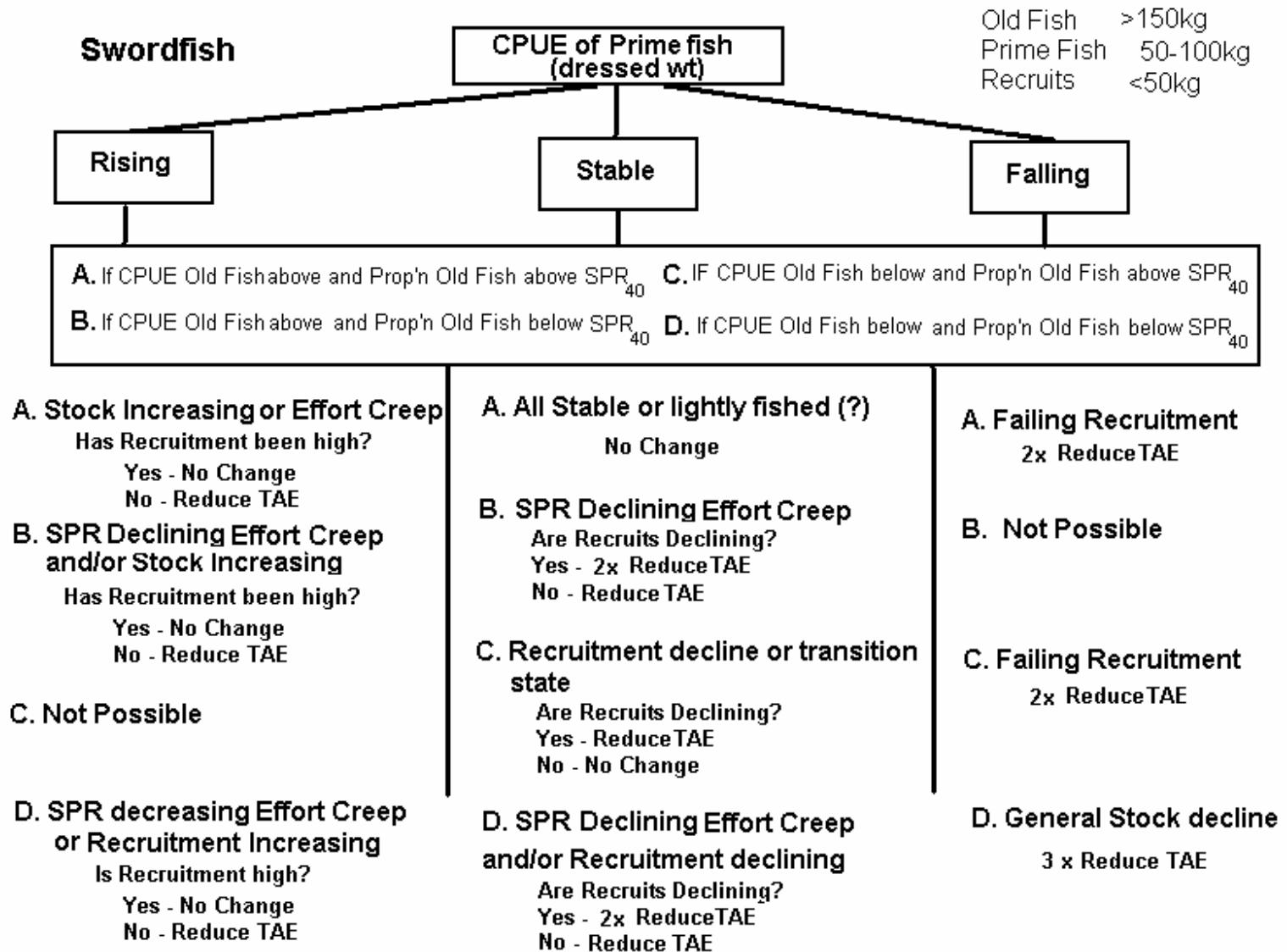




Australian federal approaches to fisheries management

- Harvest strategies without stock assessments

- empirical indicators
- CPUE and body weights
- simulation tested to show it achieves the aims of the Harvest Strategy Policy



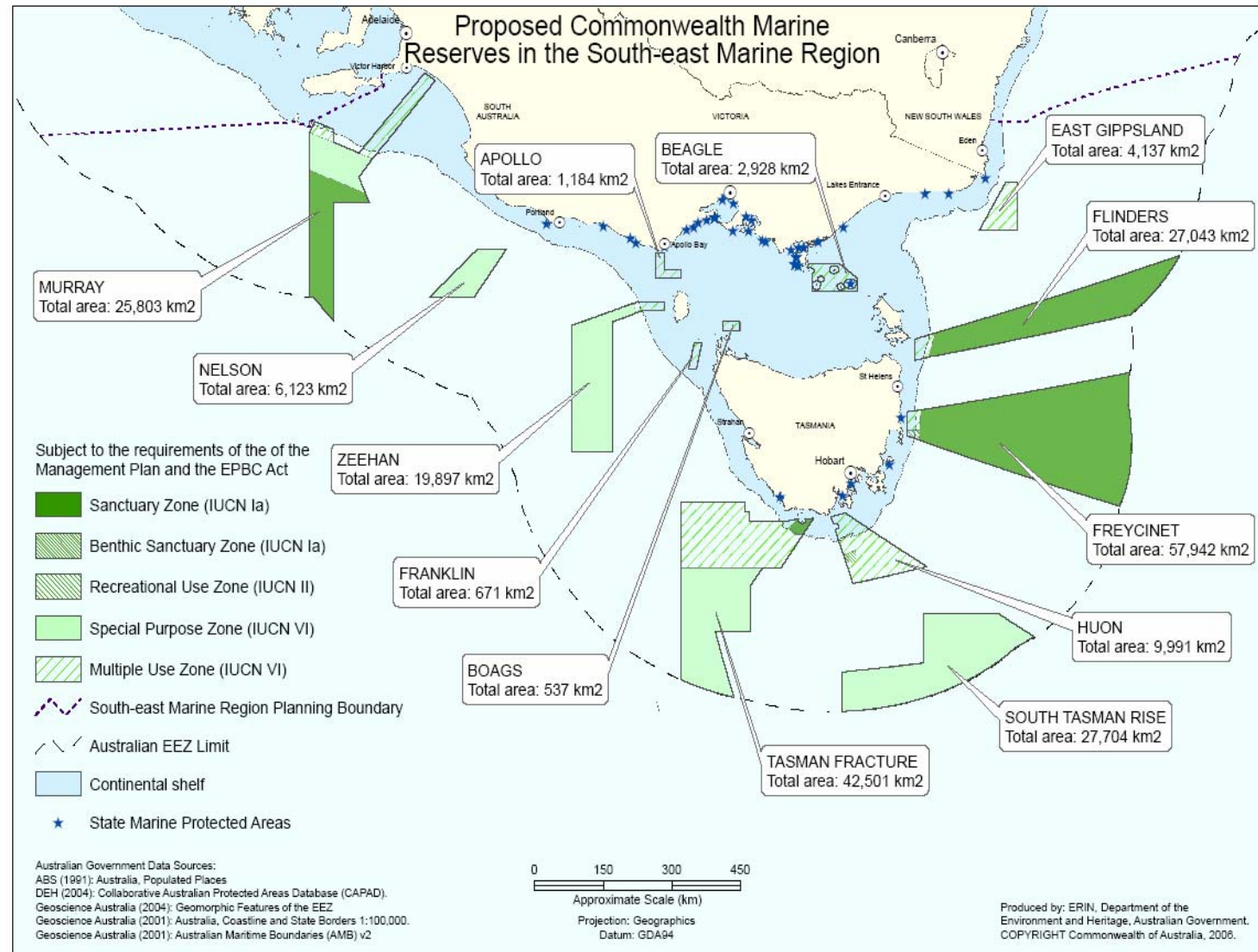


Australian federal approaches to fisheries management

- Spatial management on an MPA system

Protection provided by MPAs included in the ecological risk assessment of fishing.

-Target species, by-catch species, habitats





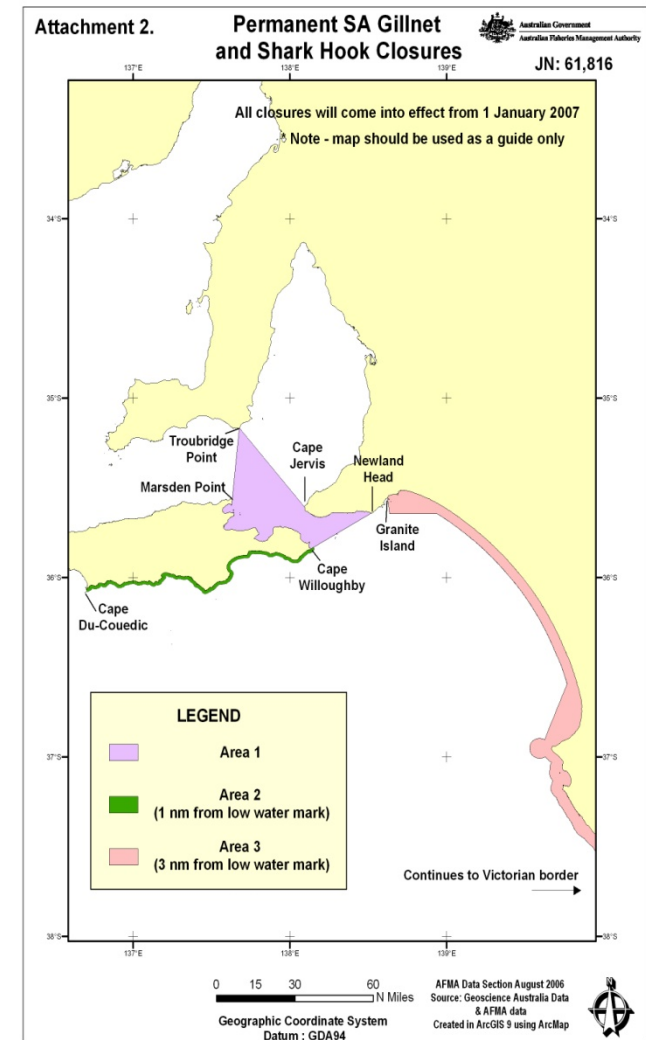
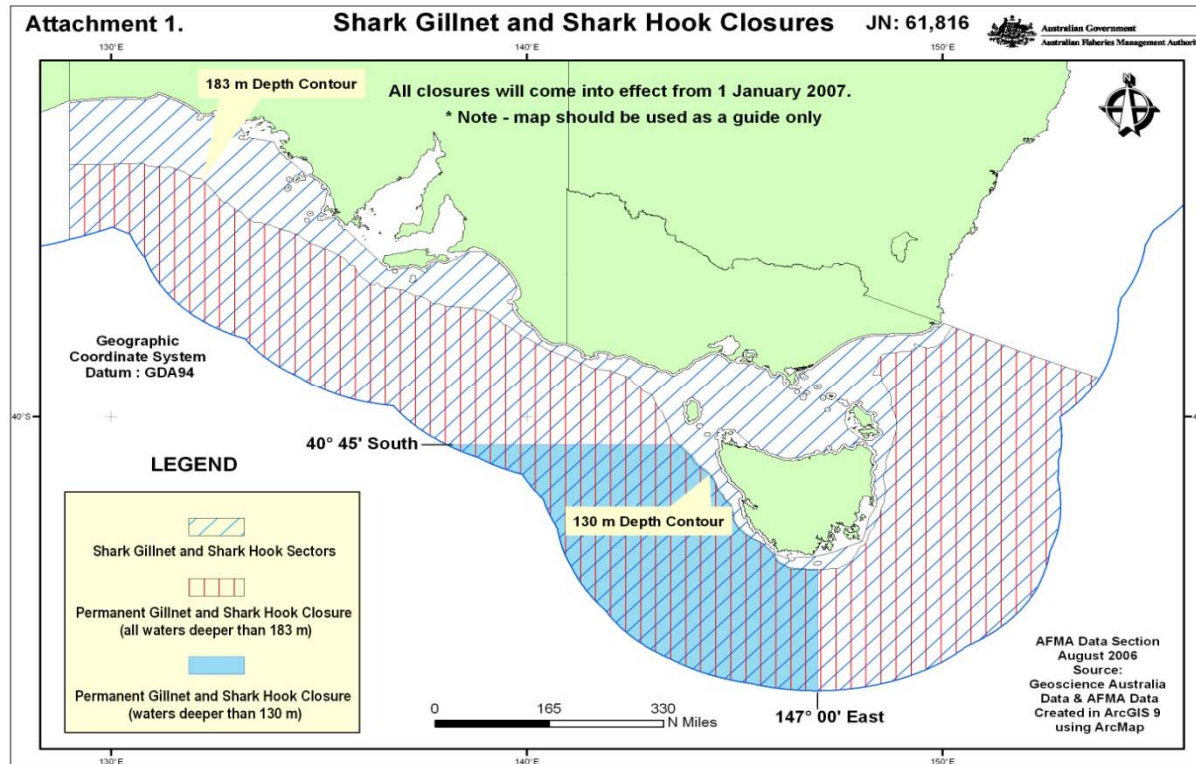
Australian federal approaches to fisheries management

- Spatial fisheries management

Two target shark species with different productivity

Small scale – breeding sites

Large scale – delivering moderate school shark catches while allowing large gummy shark catches

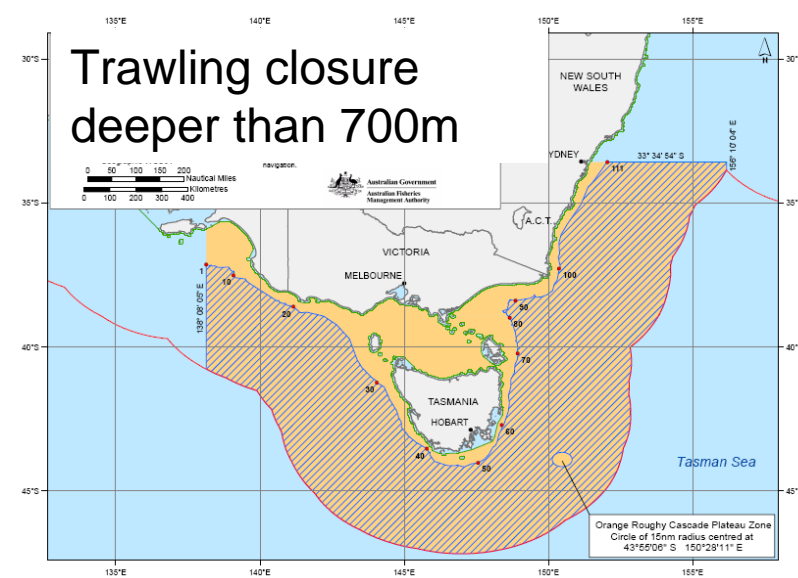
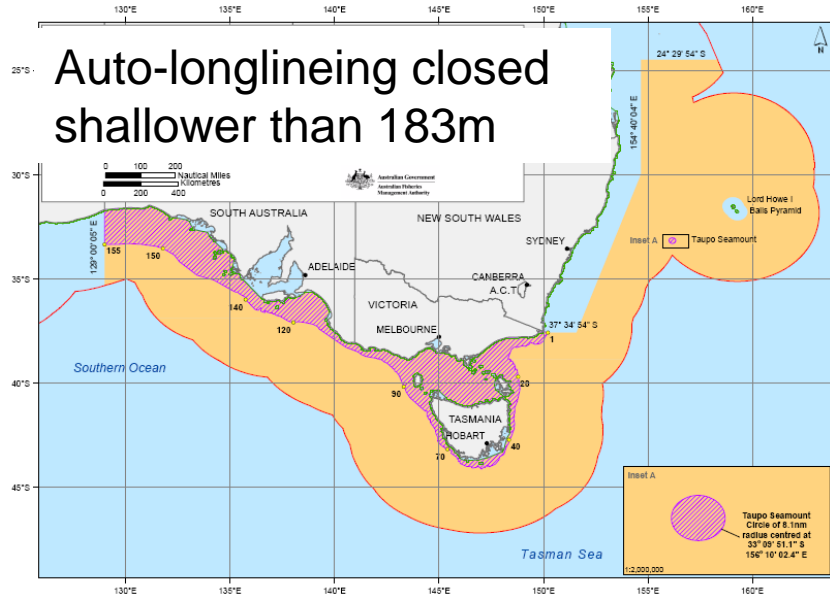




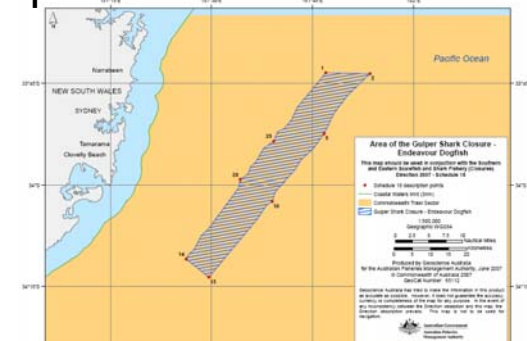
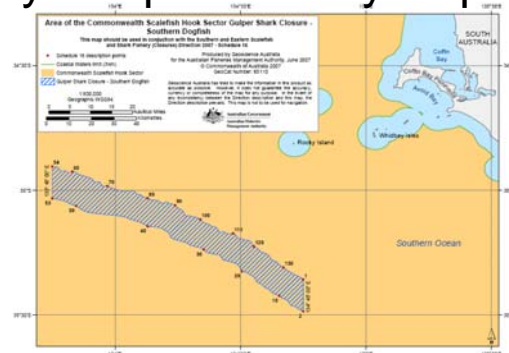
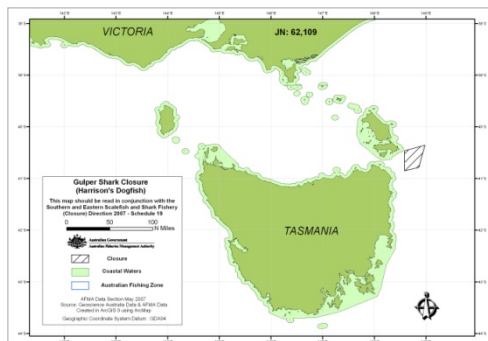
Australian federal approaches to fisheries management

- Spatial fisheries management

Spatial management of gear types – by-catch management, transitions in target species management (i.e. changing selectivities from changing gear types)



Closures to maintain very low productivity slope shark species





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Conclusions

- We are all searching for ways to achieve economic and ecological sustainability for fisheries
- There is no 'silver bullet'.
 - Beware of the single solution, be it an economic incentive, MPAs, 'top down' control or participant control.
 - The solutions some cases may be accurate measurement and modelling and in others may be qualitative assessments and a greater margin for error
- But better alignment of risks, costs and benefits is key.
 - improved valuation, pricing and incentives at the business end
 - clarity of requirements at the social and government end





Ecosystem Based Fishery Management

Various relevant websites

[Commonwealth of Australia Fisheries Harvest Strategy \(2007\)](http://www.daff.gov.au/fisheries/domestic/harvest_strategy_policy)

http://www.daff.gov.au/fisheries/domestic/harvest_strategy_policy

[Australia's Oceans Policy \(1998\)](http://www.environment.gov.au/coasts/oceans-policy/index.html)

<http://www.environment.gov.au/coasts/oceans-policy/index.html>

[Marine Bioregional Planning](http://www.environment.gov.au/coasts/mbp/index.html)

<http://www.environment.gov.au/coasts/mbp/index.html>

[National Representative System of MPAs](http://www.environment.gov.au/coasts/mbp/mpa.html)

<http://www.environment.gov.au/coasts/mbp/mpa.html>

[Guidelines for Ecologically Sustainable Management of Fisheries](http://www.environment.gov.au/coasts/fisheries/publications/guidelines.html)

[\(2007\) for EPBC Act export approval](http://www.environment.gov.au/coasts/fisheries/publications/guidelines.html)

<http://www.environment.gov.au/coasts/fisheries/publications/guidelines.html>

[AFMA's risk assessment and risk management approaches](http://www.afma.gov.au/environment/eco_based/eras/default.htm)

http://www.afma.gov.au/environment/eco_based/eras/default.htm

http://www.afma.gov.au/environment/eco_based/eras/docs/fact_sheet.pdf



Ecosystem Based Fishery Management

ERA methodology

Level 1 - qualitative

- Scale and intensity of all activities in a fishery.
- Identify key components of species, habitat etc
eg population size, range, age structure, reproductive capacity...
- Plausible worst case impact scenarios of activity on components
- Standardised consequence scores for risk, including precaution

Level 2 - semi quantitative

- Assessment of each species, habitat etc. for ecological productivity and susceptibility to fishing activities
- Standardised tables for productivity based on ecological properties
- Susceptibility= availability x encounterability x selectivity x post capture mortality
- Standardised scores for productivity and susceptibility, including precaution

Level 3

Quantitative risk assessment based on measuring abundance eg. Stock assessment, population viability analysis, 'landscape' model of habitat dynamics



Ecosystem Based Fishery Management

6. Harvest strategies become management strategies for EBFM

Major change needed in management for the “multi-everything” SE Australian fisheries

- with stakeholders
- with science

Alternative management strategies developed and evaluated:

1. qualitatively by facilitated stakeholder groups
 2. quantitatively by simulation testing (Atlantis model as the operating model in Management Strategy Evaluation)
- same strategy options and performance measures for both

