Fisheries Management Tools

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Session Outline

- Principles of fisheries management
- Major fisheries management tools
  - Input controls: gear restrictions, seasonal closures, spatial management
  - Output controls: quotas and size limits
- Ecosystem-based Fisheries Management
  - Biological, economic, and social objectives
  - Bycatch, habitat

Principles of fisheries management

- Fish stocks and biological production are finite
  - Potential yield needs to be estimated and biological constraints identified
- Production is a function of stock size and condition, and also of the natural environment.
  - Management should take account of fisheries assessment and environmental impacts
- Demand for resources and the ability to extract resources are opposed to sustainable stock levels
  - Management needs to set realistic objectives and controls

Cochrane, K.L., 2000, FAO Fisheries Technical Paper 424

Principles of fisheries management

- If there are multiple fisheries in a single system, they cannot all be optimised simultaneously
  - Goals and objectives need to be set at an ecosystem level, to manage species and fisheries interactions
- Uncertainty about the fishery makes it harder to manage and make good decisions
  - Management plans should include risk assessments, and take a conservative approach where uncertainty is higher
- Short-term demands on a resource are based on social and economic priorities
  - Fisheries management must be integrated into coastal zone planning and policy

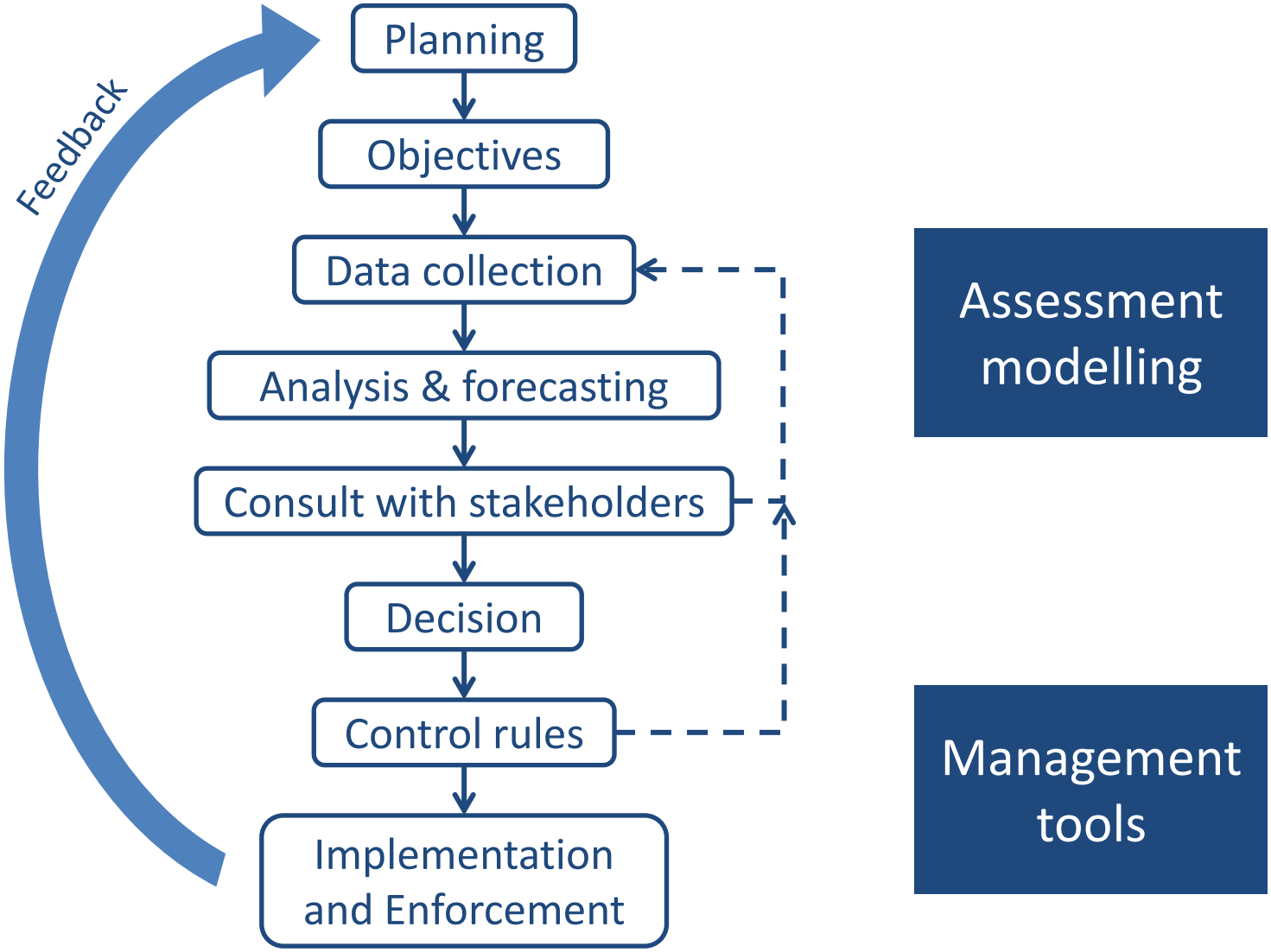
Cochrane, K.L., 2000, FAO Fisheries Technical Paper 424

Principles of fisheries management

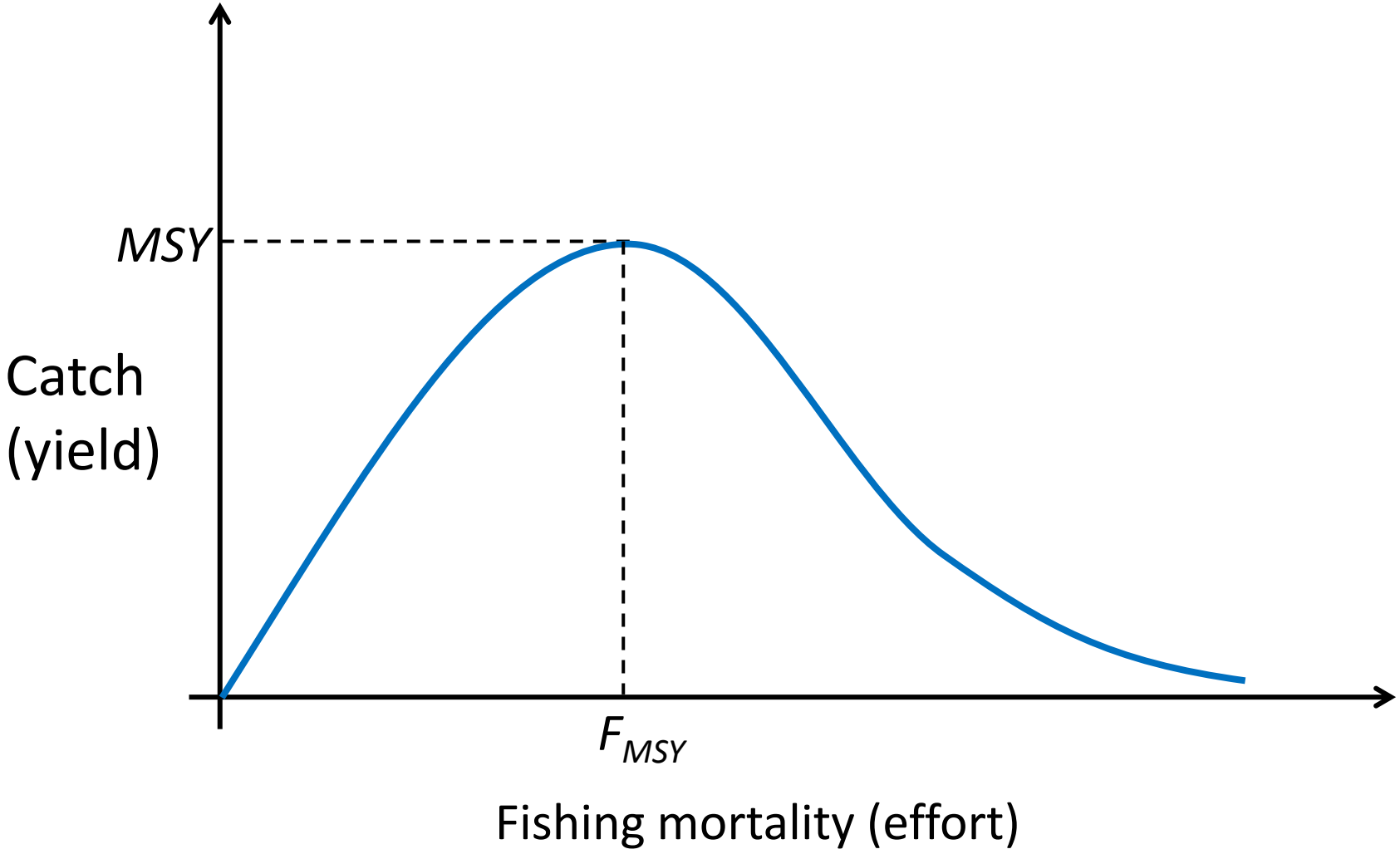
- A sense of ownership and long-term stake in the resource is conducive to responsible fisheries
  - A system of effective and appropriate access rights must be established and enforced
- Participation by fully-informed users helps to identify acceptable management systems and encourages compliance with regulations
  - Communication, consultation, and co-management should be priorities at all stages of management

Cochrane, K.L., 2000, FAO Fisheries Technical Paper 424

The management process



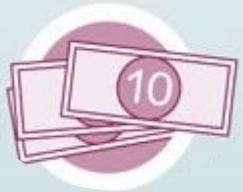
Fisheries management tools



Fisheries management tools

Catch

Total Allowable Catch (TAC) for the fishery



Landing fees

Individual quotas (shares of the TAC)

Selectivity criteria (age / size / sex)

Effort

Licences and restrictions (access or capacity)

Technical restrictions (gear or fishing practice)

Subsidies / taxation of inputs (Fuel; support for modernisation)

Limit number of fishing days (days at sea; closed periods)

Catch restrictions

- Total allowable catch
  - Operates at a fishery level
  - May include provisions for bycatch
- Individual quotas
  - Portions of the TAC
  - May be tradeable

Technical restrictions

- Regulations for selectivity
  - Age or size restrictions, sex restrictions (esp. for invertebrates)
- Gear restrictions
  - May be used to control size selectivity
  - Also controls for bycatch issues
- Fishing practices
  - May be ecological, e.g. restriction or banning of destructive techniques
  - May also be effort-limiting, e.g. banning netting

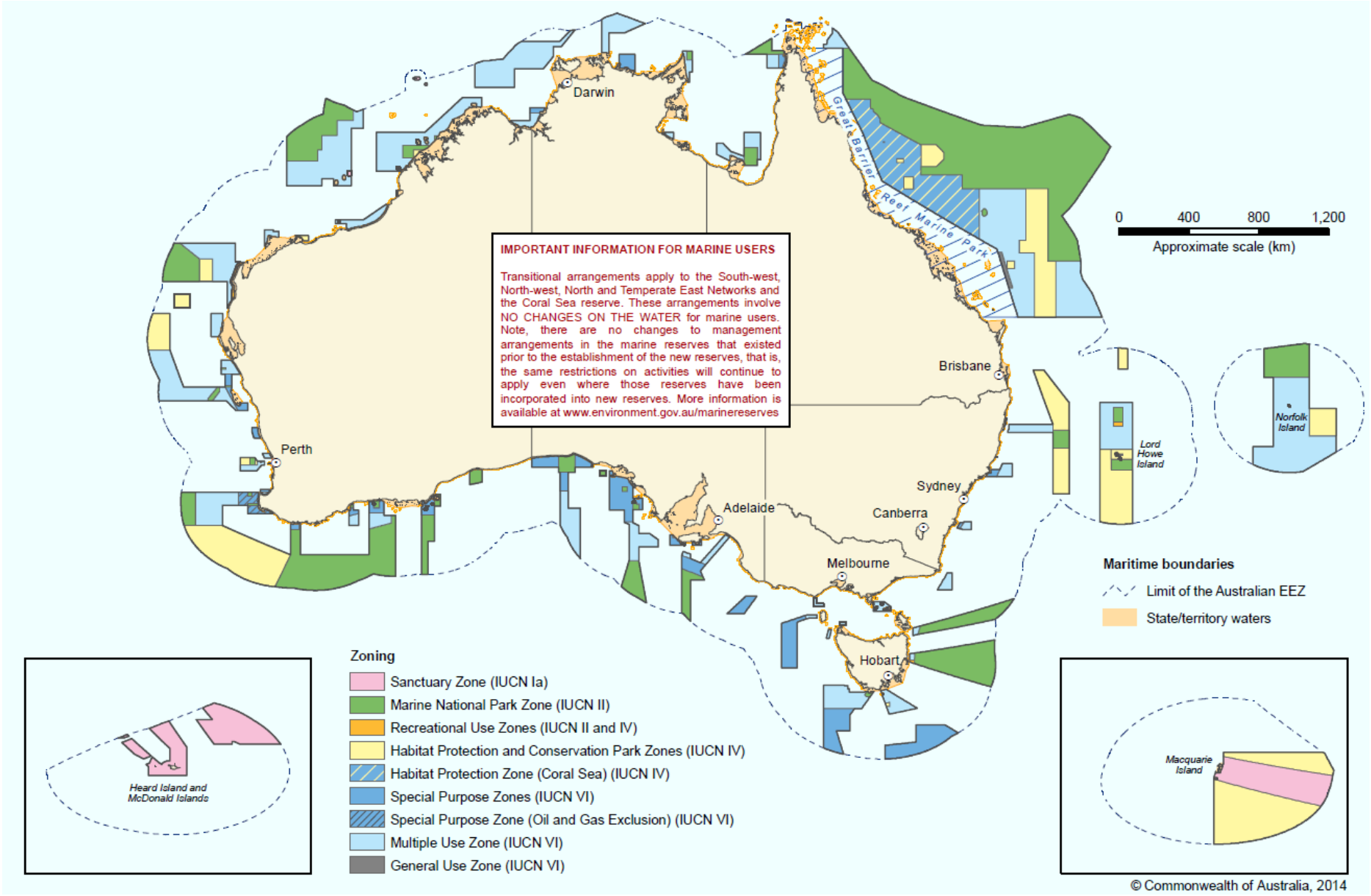
Legal/regulatory restrictions

- Fishing licences
  - Restricts access to the number of licence holders
  - May discourage entry into the fishery if the fees are high
- Capacity restrictions
  - Changes the profitability, reduces effort concentration
- Access restrictions
  - Limit days at sea per operator, or have closed seasons
  - Spatial closures (e.g. of spawning areas) can protect productivity and provide economic pressure

Economic restrictions

- Landing fees / export tariffs
  - Can be used to fund management
- Prohibitions on sale
- Fuel tariffs
  - Increases the cost to fish
- Modernisation subsidies
  - Encourage adoption of gear or practices
- Licence / vessel buy-backs
  - Reduce fishing capacity in a restricted access fishery

Marine Protected Areas



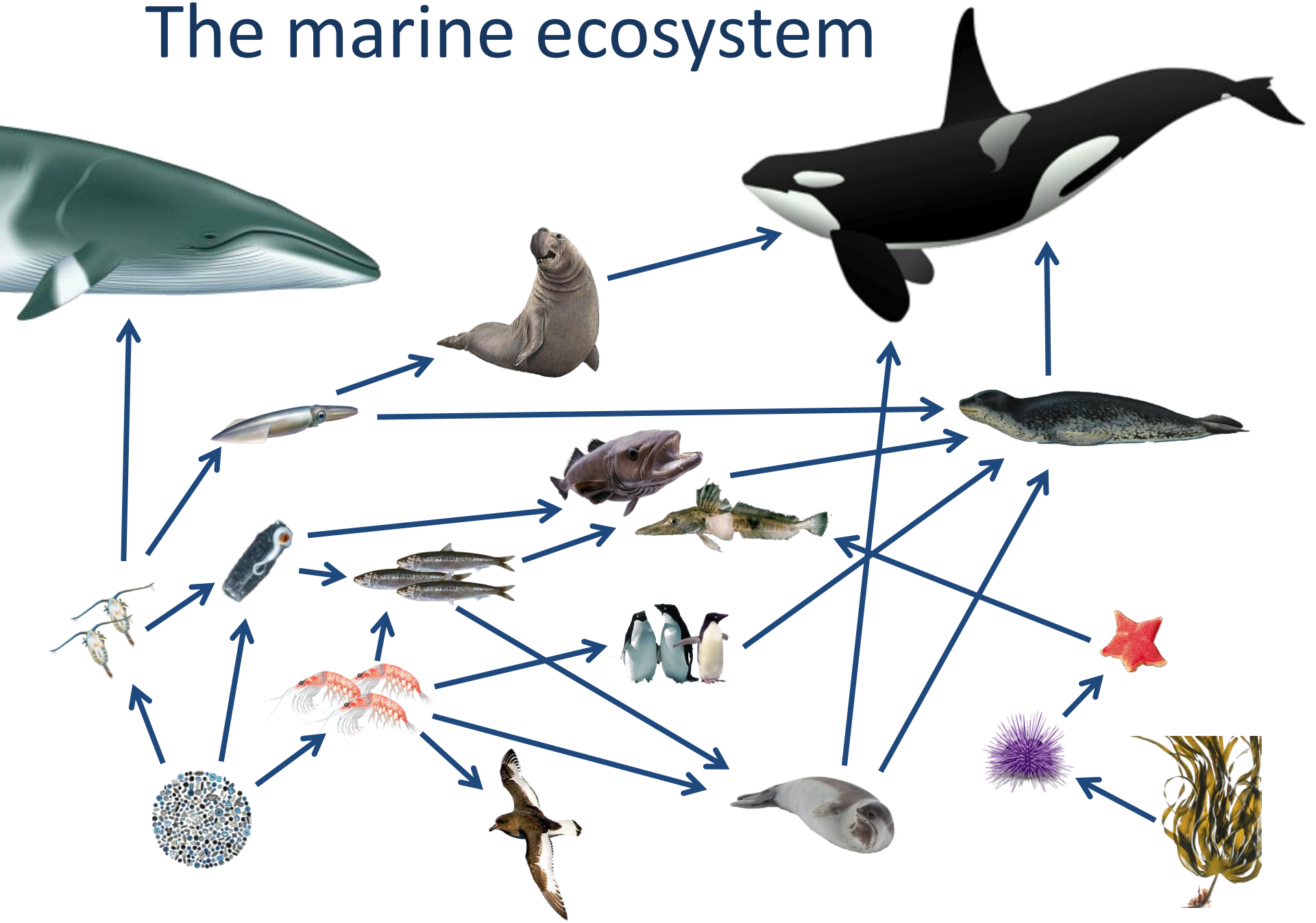
Marine Protected Areas

- Many different designation
  - Full exclusion, recreational only, etc
- Valuable as:
  - Refugia for biodiversity
  - Protecting critical habitat
  - Protecting spawning areas
- May be easy to enforce
- Evidence of overall biomass improvement is inconclusive

Ecosystem-based Fisheries Management

- Multiple fisheries in a single system
- Multiple stakeholders beyond fisheries
- Three essential components:
  - Biological well-being
  - Economic well-being
  - Social well-being (ability to achieve)

The marine ecosystem

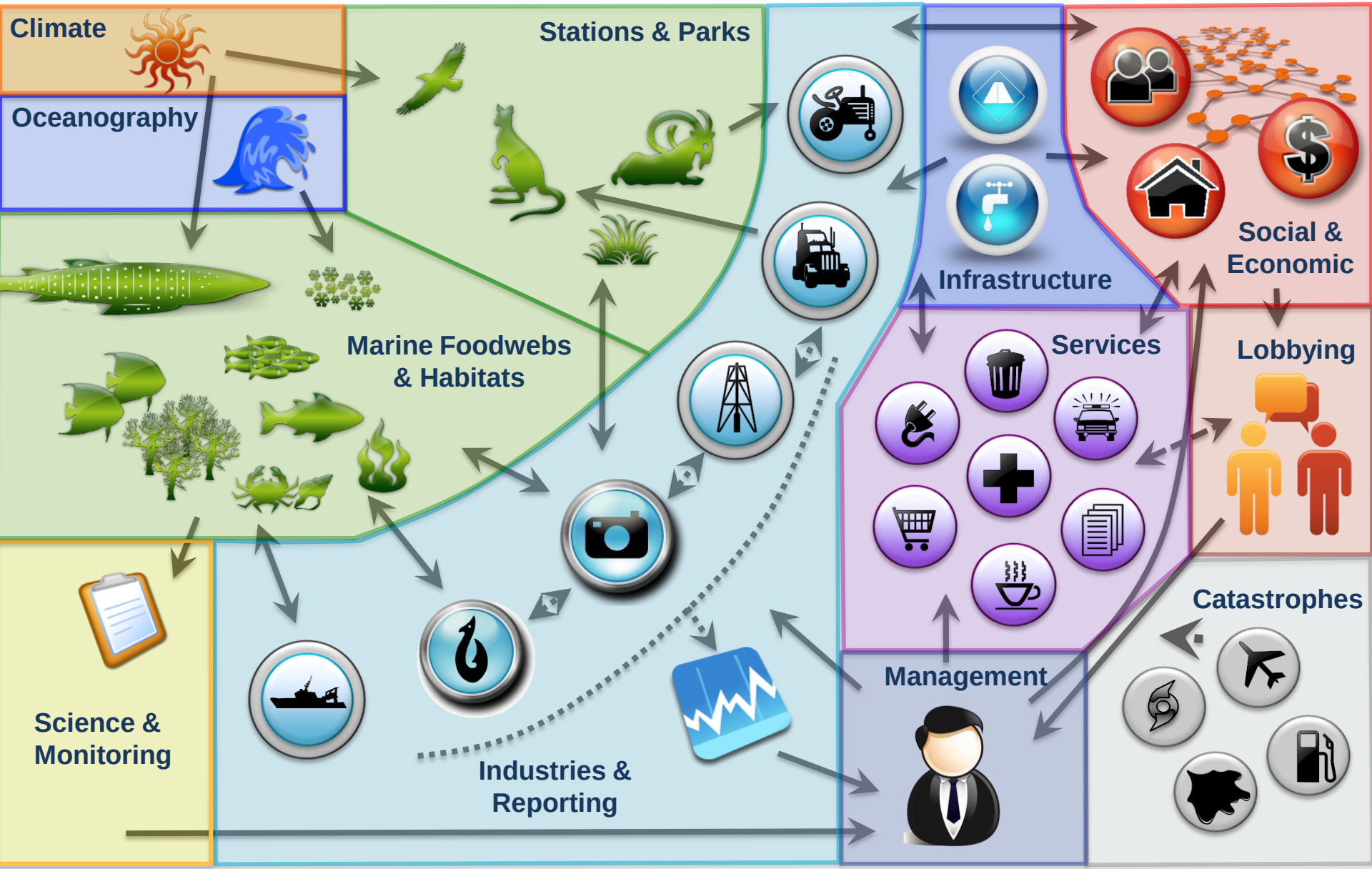


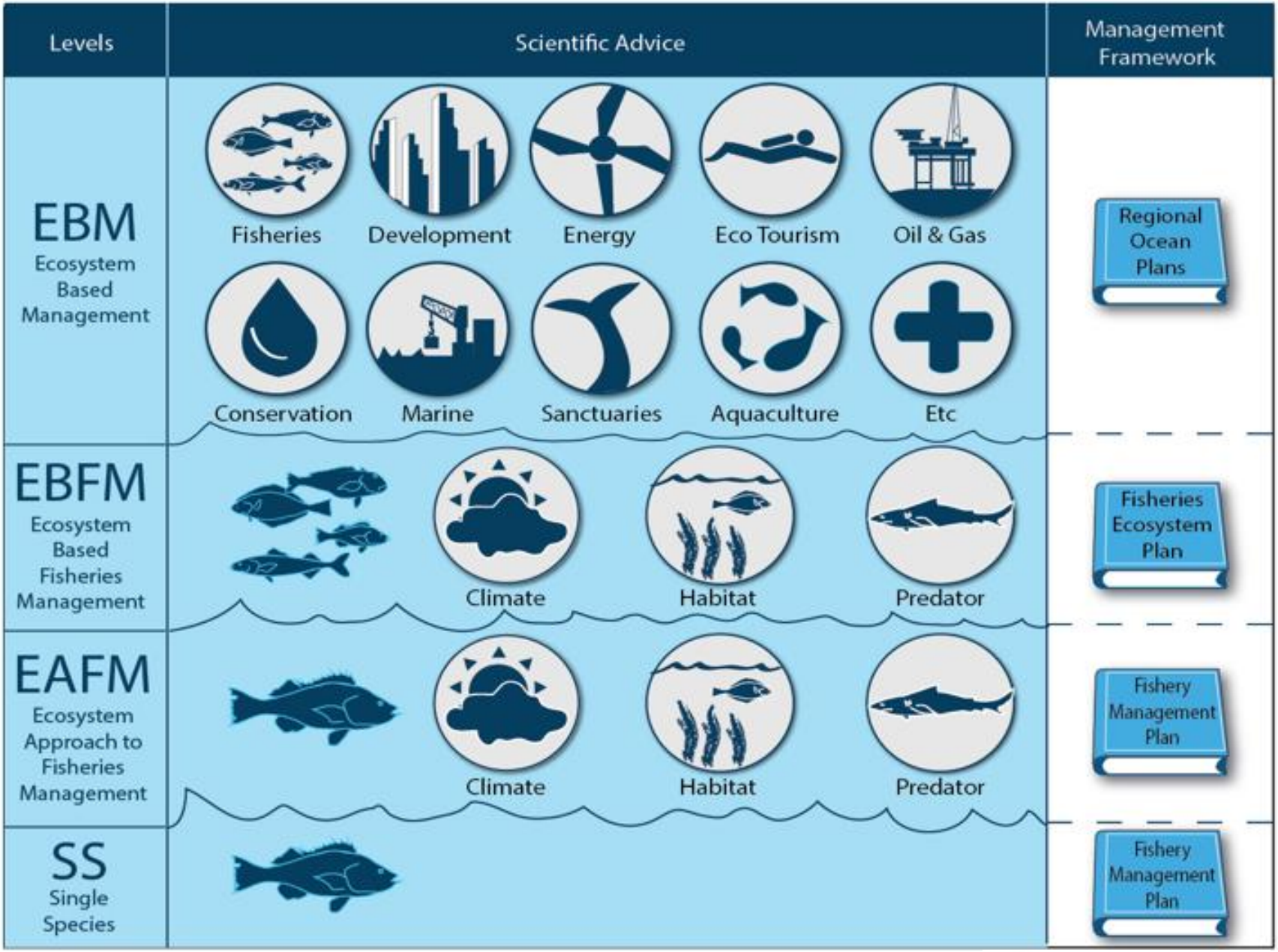
Balancing trade-offs

Shelf sea ecosystem services

- Ecological
  - filter pollutants
  - food
  - habitat (coastal protection)
  - breeding areas
  - nursery grounds
- Socio-economic
  - food (>90% fisheries)
  - water for industry
  - space for shipping, ports, industry
  - recreational opportunities
  - materials (e.g. salt, sand)
  - energy

Bio-socioeconomic systems



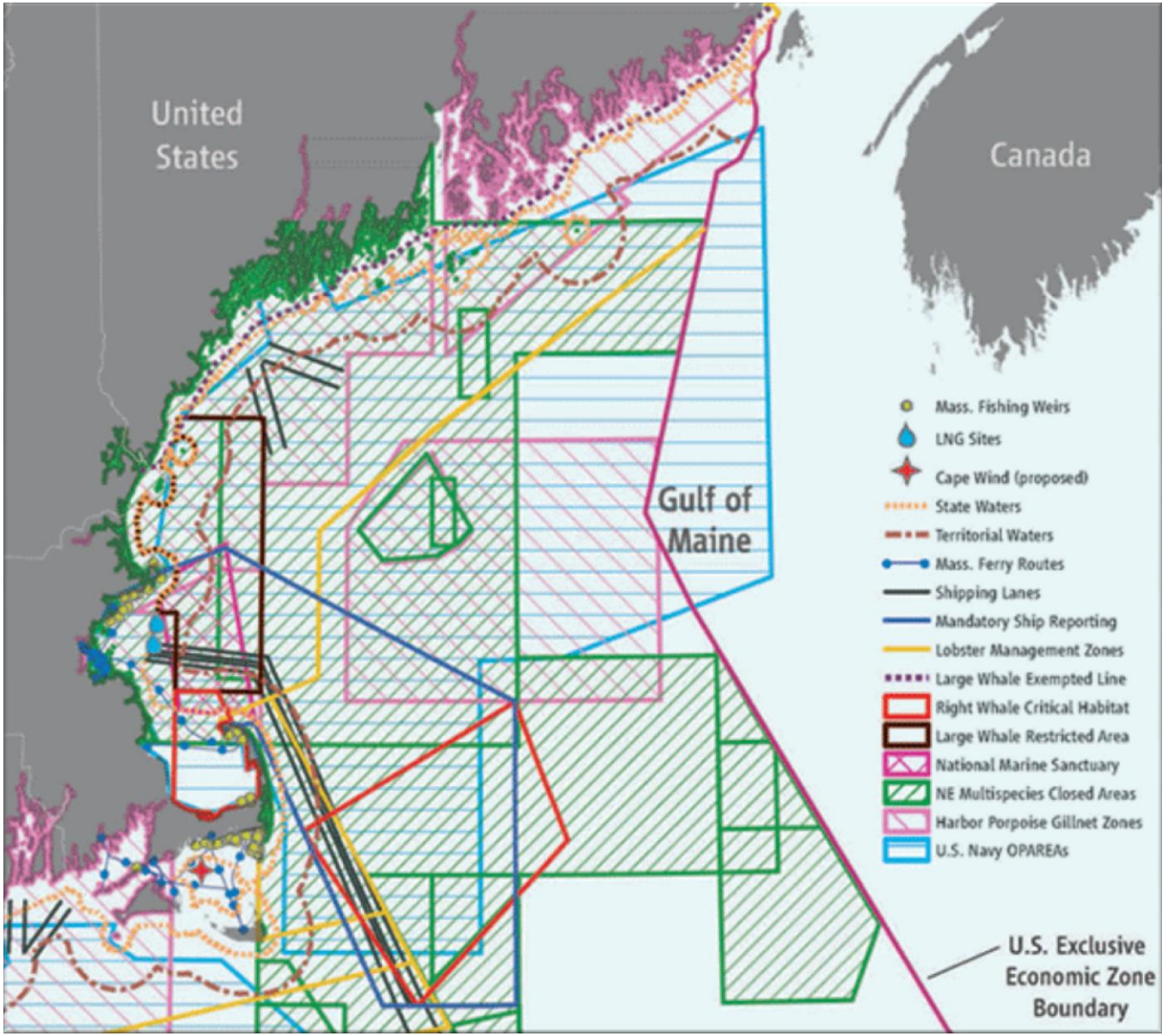


NOAA FISHERIES

Jurisdictional chaos

- United Nations Convention on the Law of the Sea (1994)
- Seas and Submerged Lands Act (1973)
- Offshore Constitutional Settlement (1979)
- 10+ federal laws
- 15+ government departments
- >100 State government Acts
- 56+ policies
- Local bylaws

Jurisdictional chaos



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