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*Asset identification & risk management  
in ecosystem based fisheries  
management*

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## *Presentation Summary*

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- Project background

- Expected outcomes

Case study West Coast Bioregion

- Findings to date

Defining the assets; spatial scale, West Coast components

Risk assessment; examples, reporting framework

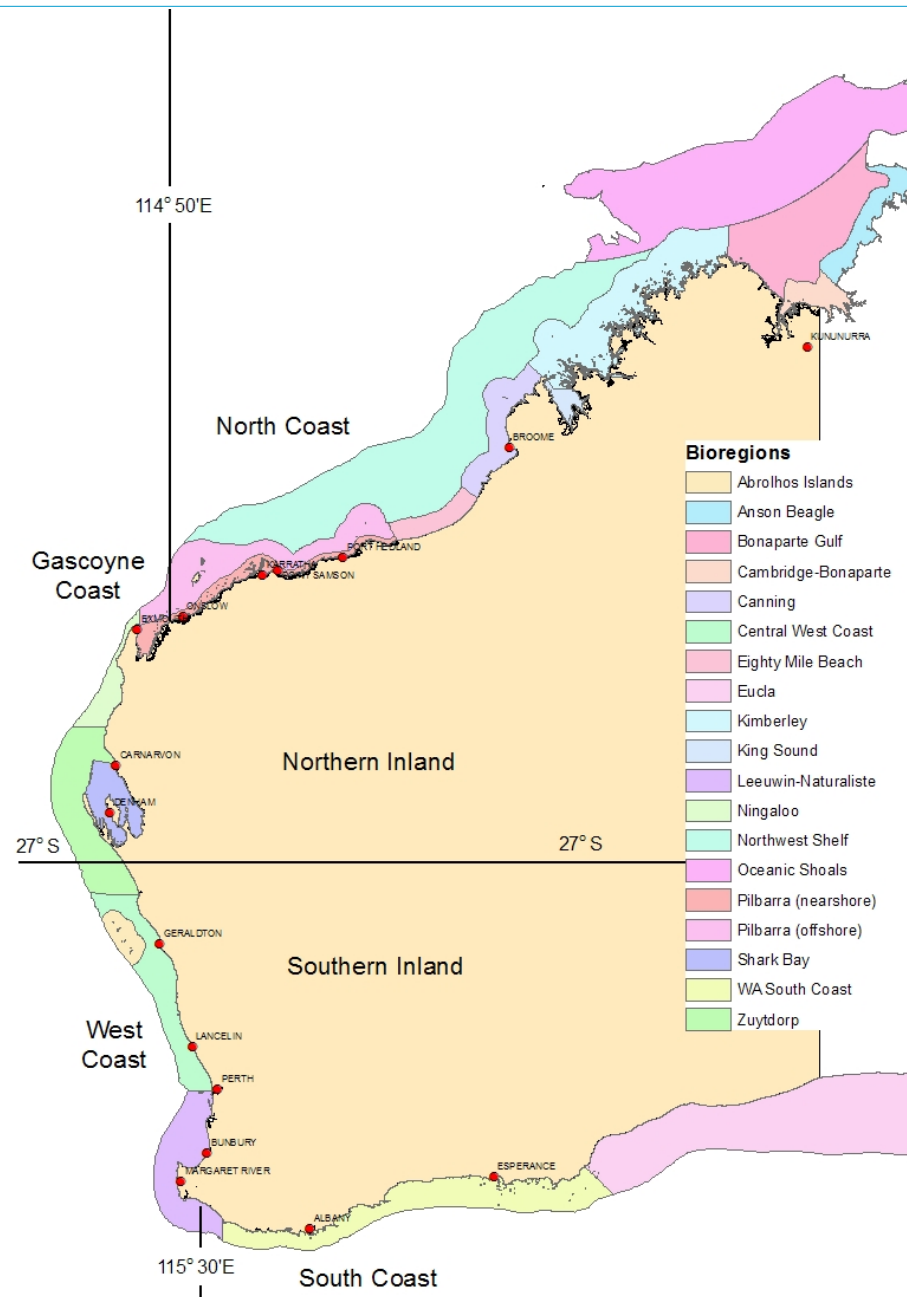
- Current activities

Reporting, input into other projects

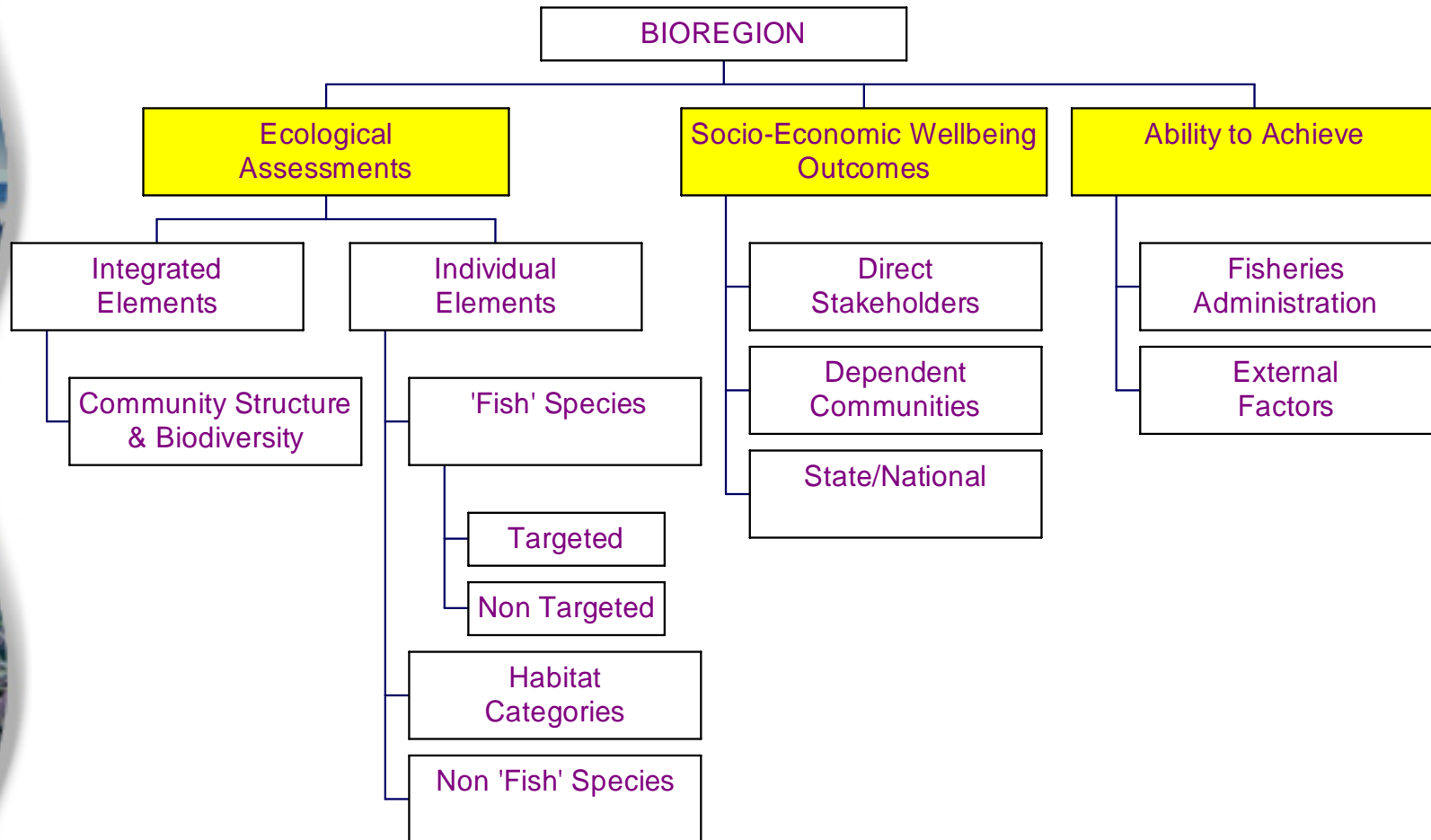
- Implications for management & policy

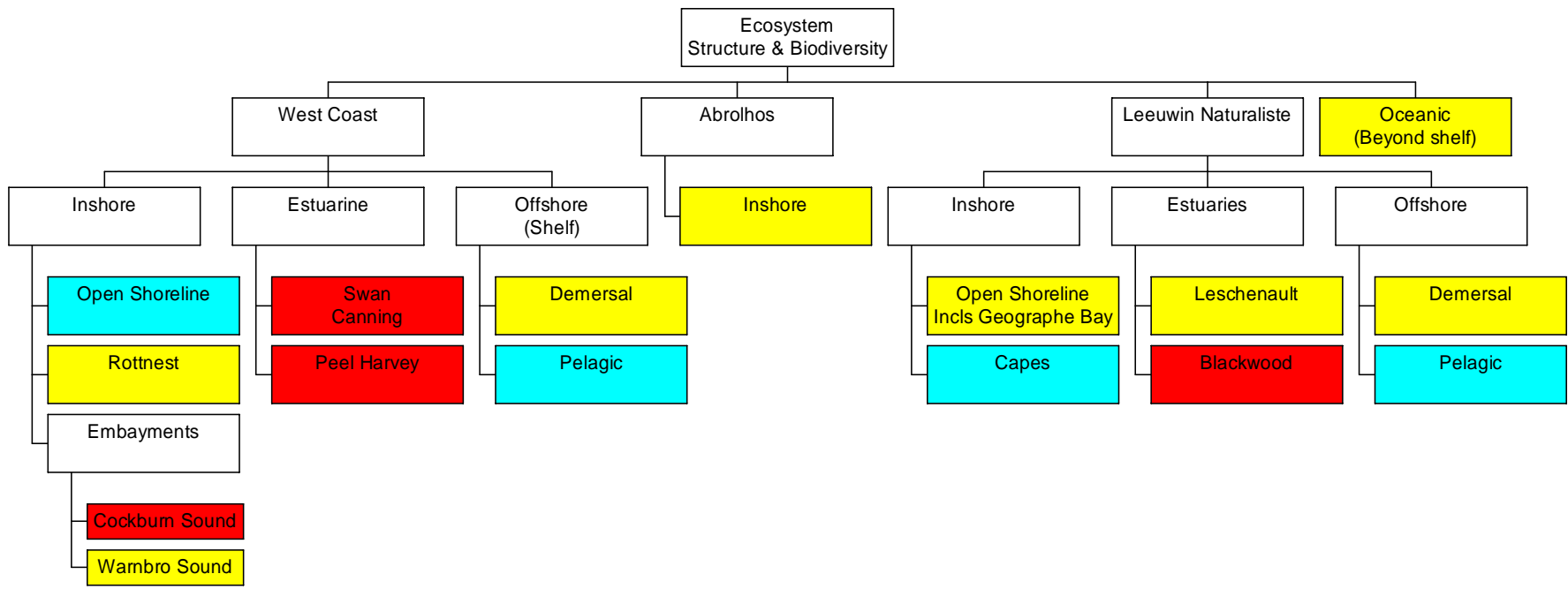
- Future plans

# Spatial Boundaries



# Component Trees

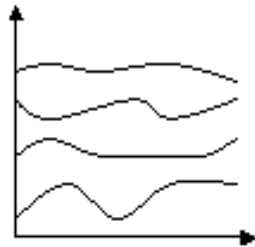




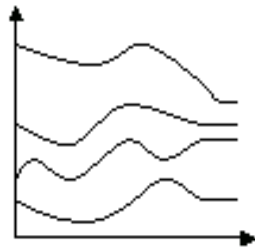
Key to components and associated risk:

- Negligible
- Low
- Medium
- High
- Extreme

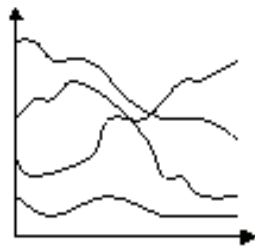
# Ecological Risk



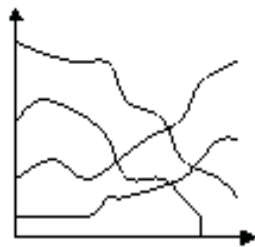
**Minor:** Interactions may be occurring but it is unlikely that there would be any change outside of natural variation.



**Moderate:** Measurable changes to the ecosystem components without there being a major change in function.

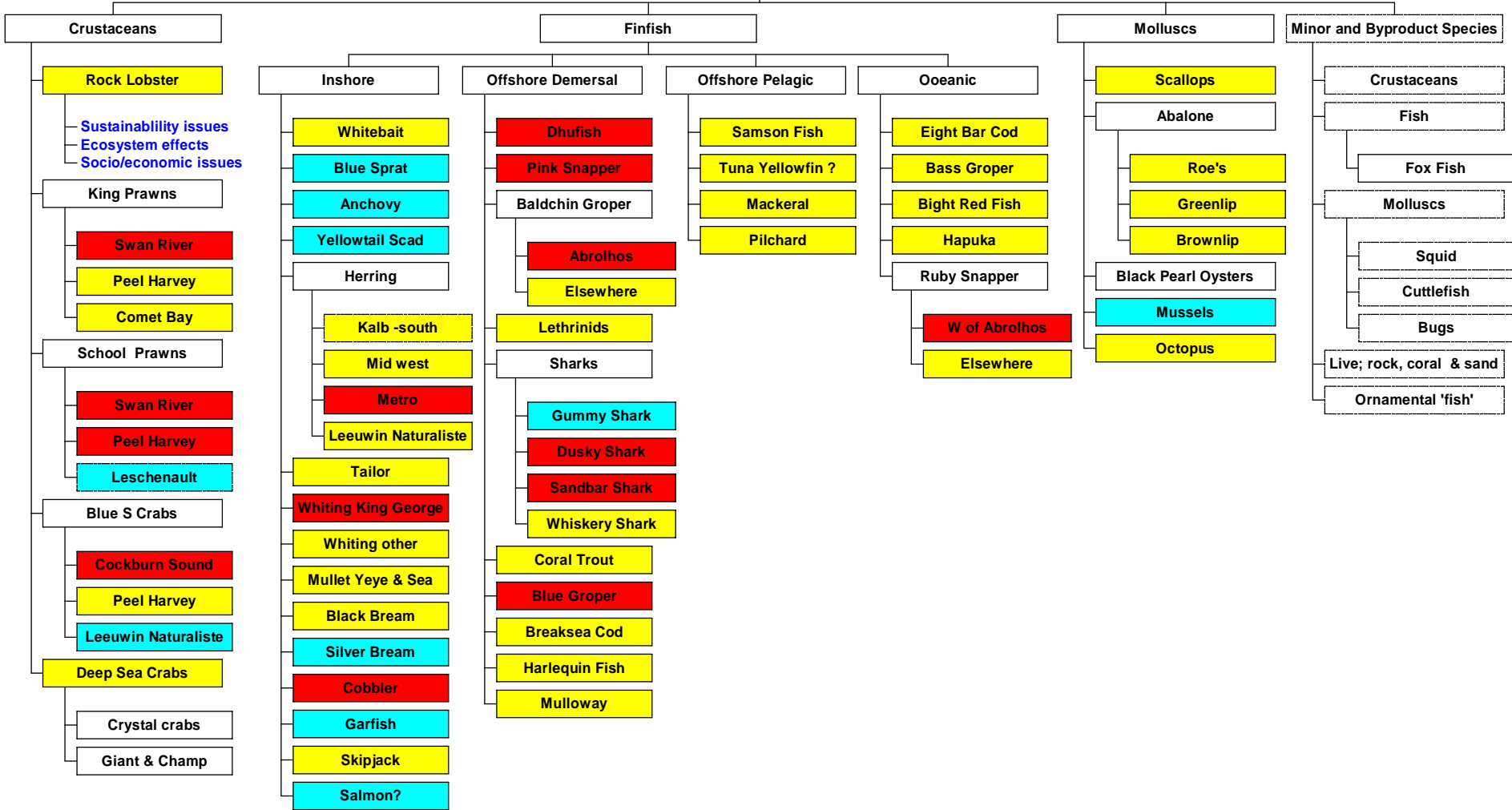


**Major:** Ecosystem function altered measurably and some function or components are locally missing/ declining/ increasing &/or allowing new species to appear.



**Extreme:** An extreme change to ecosystem structure and function. Different dynamics now occur with different species/groups the major targets of capture.

Retained 'Fish' Species



# Risk Matrix

- Risk Assessment assists in the separation of minor acceptable risks from the major unacceptable risks
- It also helps in priority setting
- Risk is the chance of something happening that will have an impact on the objectives (Standards Australia)
- Different objectives can result in a different level of risk
- Risk Value = Consequence x Likelihood

		Consequence Level			
		Minor	Moderate	Major	Extreme
Likelihood		1	2	3	4
Remote	1	1	2	3	4
Unlikely	2	2	4	6	8
Possible	3	3	6	9	12
Likely	4	4	8	12	16



# Ecological consequence table

Level	Ecological (Target/Vulnerable Species)
<b>Minor (1)</b>	Either not detectable against background variability for this population; or if detectable, minimal impact on population size and none on dynamics. Spawning biomass 100% - 70% unfished levels
<b>Moderate (2)</b>	Fishery operating at, or close to, full exploitation rate such that the long-term recruitment/dynamics are not being adversely impacted. Spawning Biomass < 70% - $B_{msy}$
<b>Major (3)</b>	Stock has been reduced to levels that are now directly affecting future recruitment levels or severely affecting their capacity to increase from a depleted state (i.e. recruitment overfishing). Spawning Biomass < $B_{msy}$ - 5 %
<b>Extreme (4)</b>	Stock size and recruitment levels reduced to an extent that local extinctions or significant species range contraction > 50% have occurred. If it continues it would require listing in an appropriate endangered IUCN category and extinctions could result. Spawning Biomass < 5%

Level	Descriptor
<b>Likely (4)</b>	It is expected to occur (Probability of 40 - 100%)
<b>Possible (3)</b>	Evidence to suggest this is possible and may occur in some circumstances (Probability of 10 - 35%)
<b>Unlikely (2)</b>	Uncommon, or has only been known to occur elsewhere (Probability of 2 - 10%)
<b>Remote (1)</b>	Never heard of, but not impossible (Probability < 2%)



# Risk & response

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<b>Risk Category</b>	<b>Qual. Risk Values</b>	<b>Likely Management Response</b>	<b>Likely Reporting Requirements</b>
<b>Low</b>	1-4	None Specific	Justification
<b>Medium</b>	6-8	Specific Management/Monitoring Needed	Full Performance Report
<b>High</b>	9-16	Increases to management activities needed	Full Performance Report

## *Asset table (justification of risk)*

ASSET	Objective	Current Risk	Justification of Current Risk Likelihood of future changes (time frame ~ 5 years)	Time Frame 20 years (incg Climate Change effects)	Possible Management Actions
<b>WEST COAST</b>					
Inshore Open Shoreline	Fishery		Little change, although could be impact from recreational fishing pressure on target species, rather than ecosystems.	No major change	
Inshore Islands Rottneest	Fishery External		Increased boat registration, increasing boat numbers. Little change.	Major risk with increase in water temperatures and possible decrease in the strength of the Leeuwin Current.	
Inshore Embayment Cockburn Sound	External		May get worse from increased developments (e.g. ports). Increased urban development.	No major change as impacted by too many other things.	
Inshore Estuaries Peel Harvey	External		Likely to get worse with increased eutrophication: 4x3=12, 3x4=12 Current monitoring showing water quality improvements except up the rivers.	Greater Risk Even less fresh water flushing	
Offshore Demersal	Fishery		-Same or better. -Commercial Fish. Management changes may reduce risk. Recreational fishing changes may increase effort/risk.	Some species may be affected (DF)	
Offshore Pelagic			-Likely unchanged. -Seabird indicators point to change already occurring (ND).	-Seabird indicators point to change already occurring. -Could be significant with LC	



## *Reporting*

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Asset/ Issue

Legislative Responsibility /Primary Management Authority

Objectives

Risk Status & Priority

Operational Objectives

Indicators & Performance Measures

Monitoring & Research Programs (Current/ Proposed)

Evaluation

Available information

Management Actions Current

Proposed if performance unacceptable

External Drivers

Possible Management by other Departments

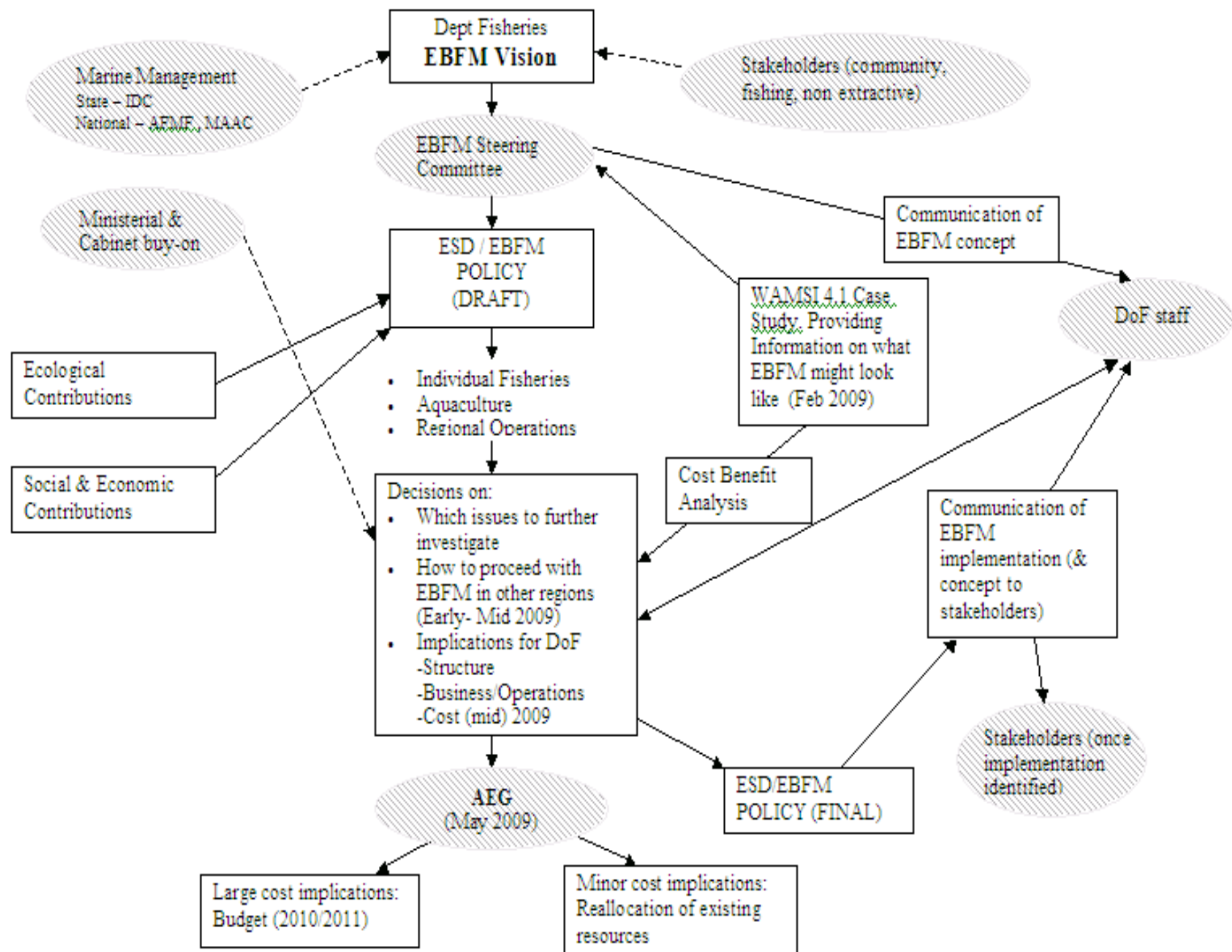
## *Prioritise to a level that can be managed*

Full Asset list


Risk  
Assessment

Managed  
list



## *Future plans*

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- Complete case study
- Integrate with Department of Fisheries strategic direction
- Use as a template for other bioregions

