

Advancing the ecosystem approach in Canadian Pacific fisheries management

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Fisheries management in Canada

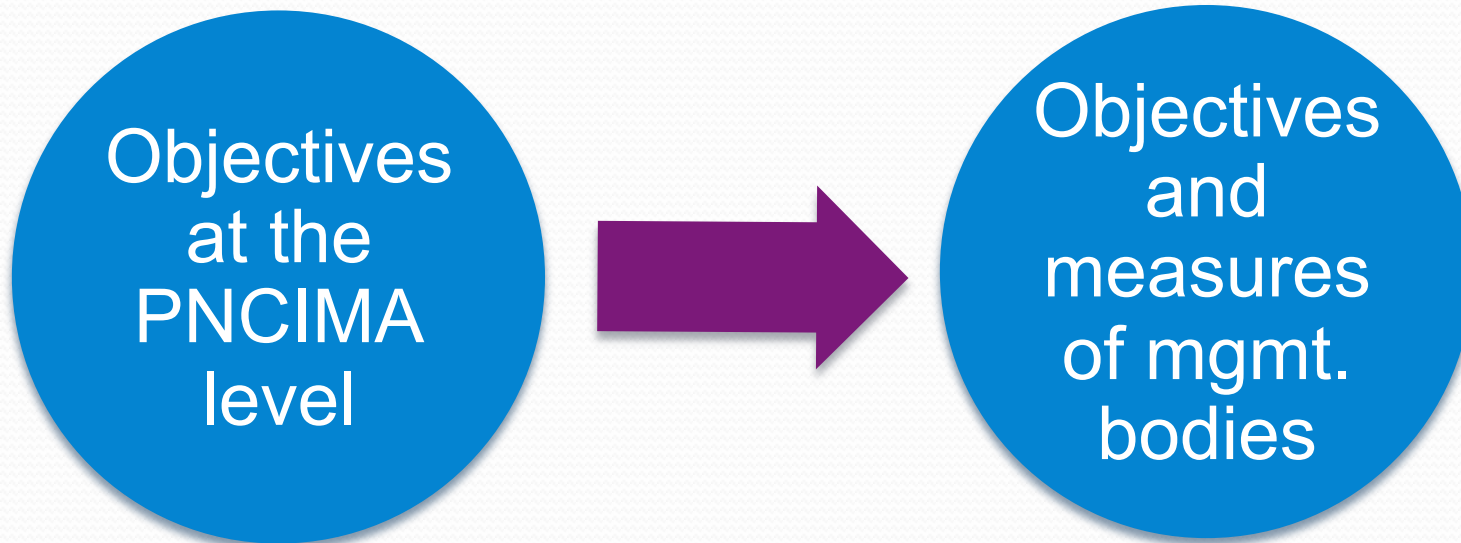
- a. Traditionally done on a stock-by-stock basis;
- b. Canada's commitments to ecosystem approach will change this;
- c. Two interrelated pathways for inclusion of the ecosystem approach into fisheries management:
 - Fisheries management policies;
 - Ecosystem based objectives for marine planning processes.

Oceans Act (1996)

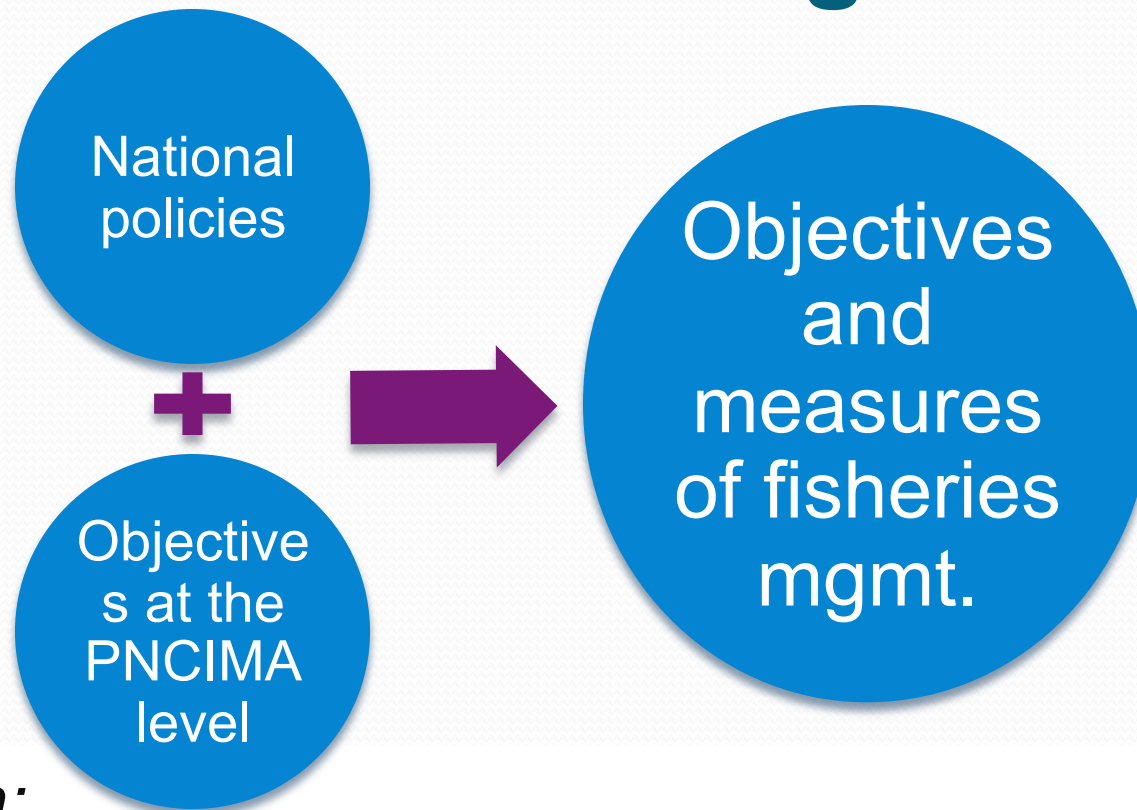
- a. It establishes integrated management of ocean uses;
- b. Conservation focus based on ecosystem approach (EA);
- c. An important outcome are the five Large Ocean Management Areas (LOMAs):
 - They require conceptual and operational objectives and associated indicators;
 - The one in the Pacific is called Pacific North Coast Integrated Management Area (PNCI)



Potential avenue for the EA in the Pacific region



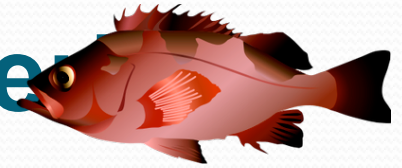
Potential avenue for the EA in the Pacific region



Our question:

To what extent does current fisheries management incorporate aspects of the EA?

Case study: Groundfish fisheries



- a. Halibut, hake, sole, sablefish, lingcod, dogfish, pollock, Pacific cod, and 29 species of rockfish;
- b. Seven sectors managed with Integrated Fishery Management Plan (IFMP);
 - Includes trawl, hook and line, and trap gears.
- d. Substantial progress in improving management:
 - 100% at-sea and dockside monitoring;
 - Individual Vessel Quotas (IVQs);
 - Vessel accountability for all catch. Transferability of the catch;
 - Closed areas.
- e. Awareness of ecosystem considerations (e.g., habitat) for several years.



Methods

- a. Review and synthesis of literature to identify the main elements EA should conserve:
 - Biodiversity;
 - Food webs;
 - Habitat;
 - Non-living aspects.

- b. Evaluation of integrated groundfish management plan (IFMP) against these four basic criteria.



Methods


3 main questions:

1. Does the IFMP **identify impacts** of the fishery?
2. Does it **include conceptual and/or operational objectives** and indicators?
3. Does it **include management measures** to address impacts/meet objectives?



Result 1:

Management objectives, indicators, and measures are explicitly focused on targeted species.



	Biodiversity			Habitat	Food webs	Abiotic
	<i>Target Species</i>	<i>Non-target</i>	<i>Species of concern</i>			
Impacts explicitly identified	✓	✗	Only for rockfish species	Only rockfish habitat	✗	✗
Conceptual objectives	✓	✗	✓	Ditto	✗	✗
Operational objectives	✓	✗	Only for rockfish species	Ditto	✗	✗
Indicators	✓	✗	Ditto	Ditto	✗	✗
Management Measures	✓	✗	Ditto	Ditto	✗	✗

Result 2:

Some measures may be mitigating broader ecosystem impacts

Existing management measures	Biodiversity			Habitat	Food webs	Abiotic
	Target Species	Non-target	Species of concern			
Quota for target species	✓	Possible	Possible	Possible	Possible	✗
Closed areas	✓	Possible	Possible	✓	Possible	Possible

Result 3:

Policy and research that address aspects of the EA.

Ecosystem elements	Policy and research
Biodiversity	•Phasing-in of precautionary harvest strategies
Food webs	•Policy for new fisheries on forage species (not implemented)
Habitat	•Sensitive benthic area policy (not implemented) •Research on habitat impacts
Abiotic aspects	-

Result 4:

Following the IFMP template would contribute to the

- a. Objectives on stock ~~and~~ ecosystem conservation
- b. Indicators to evaluate the achievement of objectives
- c. Research and measures to control bycatch
- d. Information on gear impacts

Ecosystem elements	Template
Biodiversity	•Depleted species concerns
Food webs	•Interactions with other species
Habitat	•Habitat requirements and impacts from the fishery •Location of sensitive areas within the range of the fishery •Research being conducted and research needs •Habitat protection measures
Abiotic aspects	-



Strengths

- a. Recognition of the importance for accounting for ecosystem considerations;
- b. Existing management tools can be useful to achieve broader ecosystem objectives if properly extended;
- c. New policies on habitat, forage species exist



Weaknesses

- a. There is a lack of conceptual or operational objectives for ecosystem considerations in the IFMP;
- b. There are no objectives that require the use of new policies.



Recommendations

- a. Follow the IFMP as it will accomplish more of what is needed for EBM;
- b. Ensure the inclusion of ecosystem objectives within the management plan;
- c. Establish objectives and requirements to implement national policies.

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Healthy Oceans. Healthy Communities.

Pacific North Coast Integrated Management Area (PNCIMA)



PNCIMA Boundary: Fisheries and Oceans Canada
Mapping: Living Oceans Society.

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EBM Framework

LOS EBM FRAMEWORK: SUPPORTING DOCUMENTS			Arkema et al., 2006	Botsford et al. 1997	CBD COP 5 Decision V/6	Chamberlain et al., 2010.	Christensen et al. 1996	COMPASS Statement 2005	EPAP	FAO 2003 Fisheries Paper 443	Francis et al. 2007	Grumbine 1994	IJCN 2000	Link 2002	National Research Council 1999	Pew Oceans Commission 2003	Pikitch et al. 2004	US Commission on Ocean Policy	Ward et al 2002 (WWF)	Warren	Witherell et al. 2000		
Objective	Manage human activities to maintain ecosystem structure, function, stability	Conserve ecological structure			x	x	x	x	x			x	x										
		Conserve ecological function and/or key processes			x	x			x	x			x	x			x	x	x				
		Conserve ecological stability and/or resiliency					x	x	x			x							x				
Principles	Humans depend on, and affect, ecosystems	A Humans are part of ecosystems	x		x	x	x	x		x		x	x		x					x	x	x	
		B Humans derive benefits from ecosystems				x																	
		C Humans have many impacts on ecosystems																					
	Ecosystems are dynamic and complex	D Knowledge of ecosystems is limited			x	x	x	x		x	x					x	x	x					
		E Ecosystems exist on multiple scales	x		x	x	x			x	x	x				x							
		F Ecosystems have open boundaries and interconnectedness	x		x	x	x	x	x	x	x	x						x					x
		G Ecosystem change is constant and often unpredictable	x		x	x			x	x	x	x										x	x
		H Ecosystems have limits to their ability to absorb impacts			x			x	x		x								x				
		I Exceeding limits can lead to sudden, unpredictable change			x					x	x								x				
		J Ecosystems can 'flip' suddenly to new, stable states								x	x		x										
	EBM is the integrated management of human activities in order to meet social objectives for the ecosystem	K Management is of human actions, not of ecosystems					x		x						x	x	x						
		L Integrated and participatory process			x	x		x		x												x	x
		M Measures are "place" or "area"-based				x	x			x	x											x	x
		N Science forms basis for management	x		x					x												x	x
		O Management should be adaptive and responsive	x		x	x	x	x	x	x	x	x	x					x	x				
		P Management should consider cumulative impacts				x				x	x									x			
		Q Management is precautionary	x	x		x			x	x	x	x			x		x					x	x
		R Burden of proof is placed on activity			x					x	x									x		x	x
		S Implemented at appropriate spatial/temporal scales			x									x									
		T Uses ecological, rather than political, boundaries	x							x		x		x	x								
Conservation Focus	Biodiversity		x						x	x	x	x	x		x	x	x	x		x	x	x	
	Habitat		x						x	x	x	x					x	x	x		x	x	
	Food webs		x						x		x		x						x		x		
	Non-living (abiotic) characteristics		x									x	x					x		x			