

# Marine protected areas in fisheries management: aliens or allies?

Serge. M. Garcia

Chair IUCN-CEM Fisheries Expert Group (FEG)



Opening Lecture at the International Workshop on “Exploring the Role of MPAs in Reconciling Fisheries Management with Conservation”. Bergen, Norway, 29 – 31 March 2011:

# 1. Preamble

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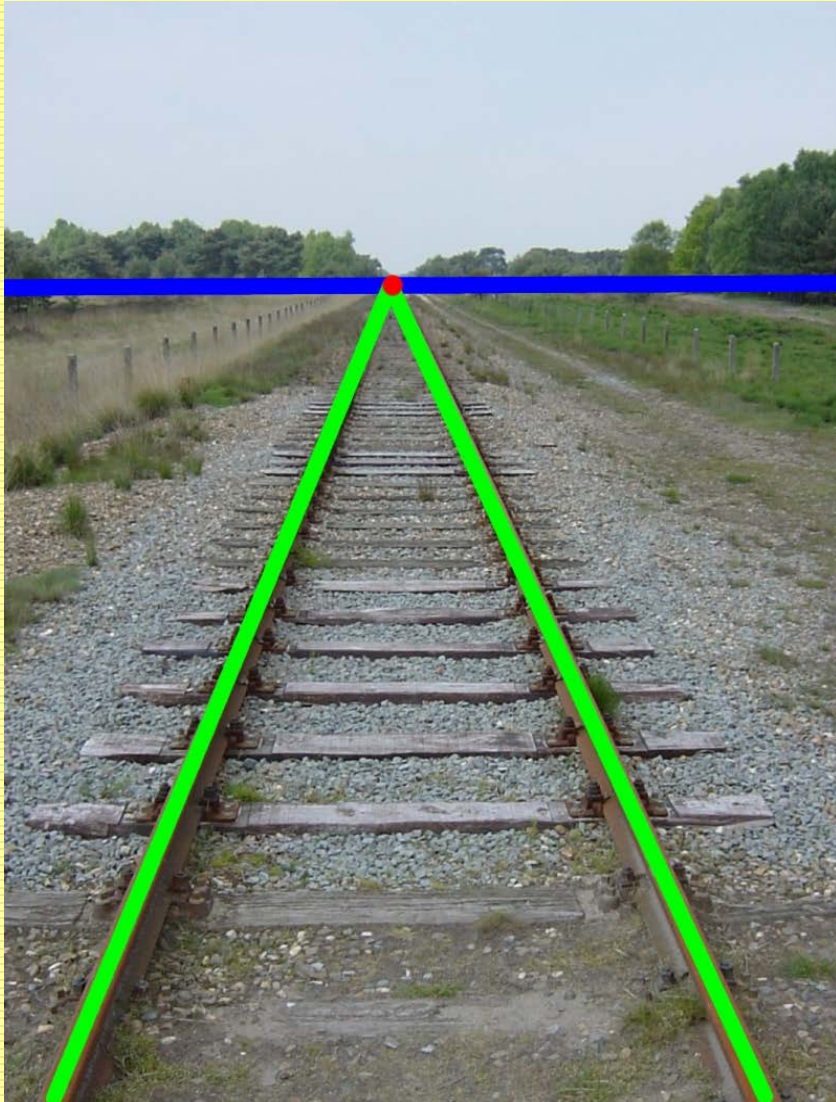
- **Marine reserves** are a promising tool for fisheries management and conservation of biodiversity, but they are not a panacea for fisheries management problems.
- For highly mobile single species fisheries with little bycatch and no habitat impact: **not more useful than conventional tools**
- For multi-species fisheries on sedentary stocks, with environmental impact issues: **not the panacea**
- **Risk for MPAs:** unfulfilled expectations, creation of disincentives, and loss of credibility
- **As a tool among others, MPAs require:**
  - case-by-case consideration. Avoid generalizations
  - careful planning, and active learning processes through effective monitoring & evaluation

# Outline

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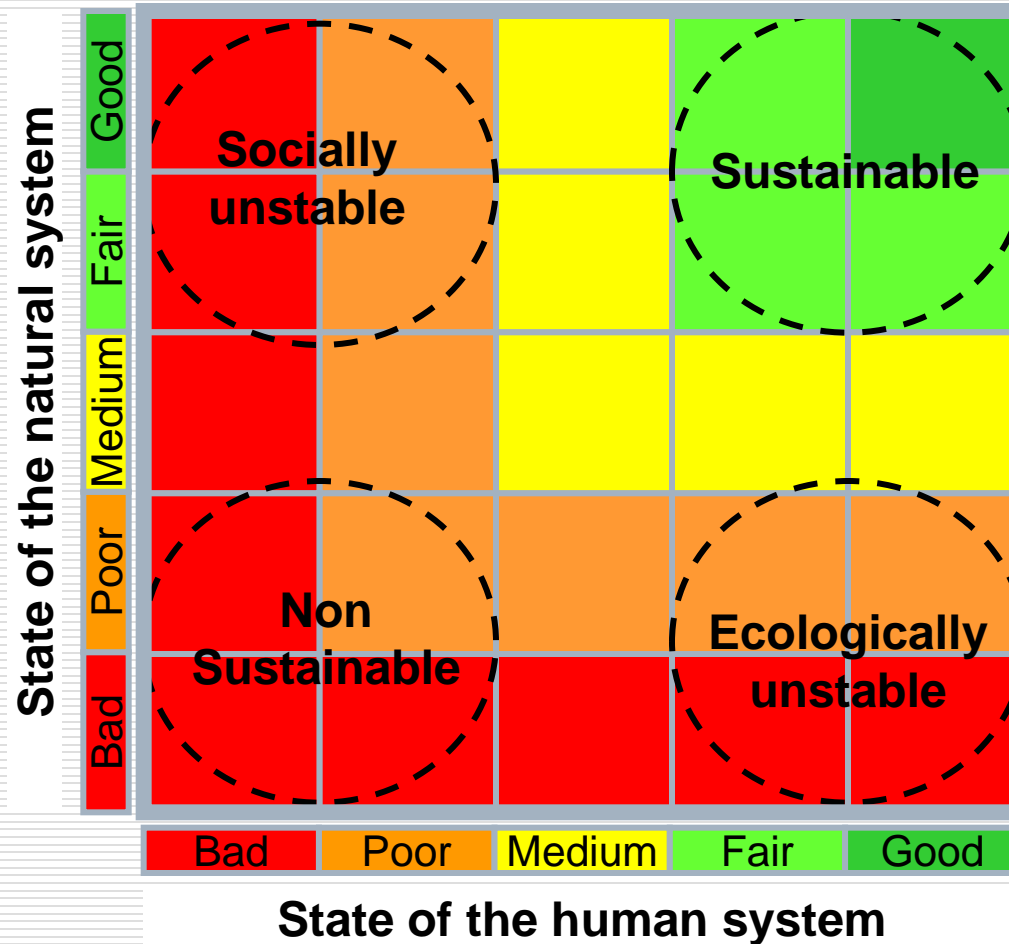
1. Preamble
2. Converging governance
3. MPA definitions
4. Conclusions : MPAs and fisheries

## 2. Historical convergence

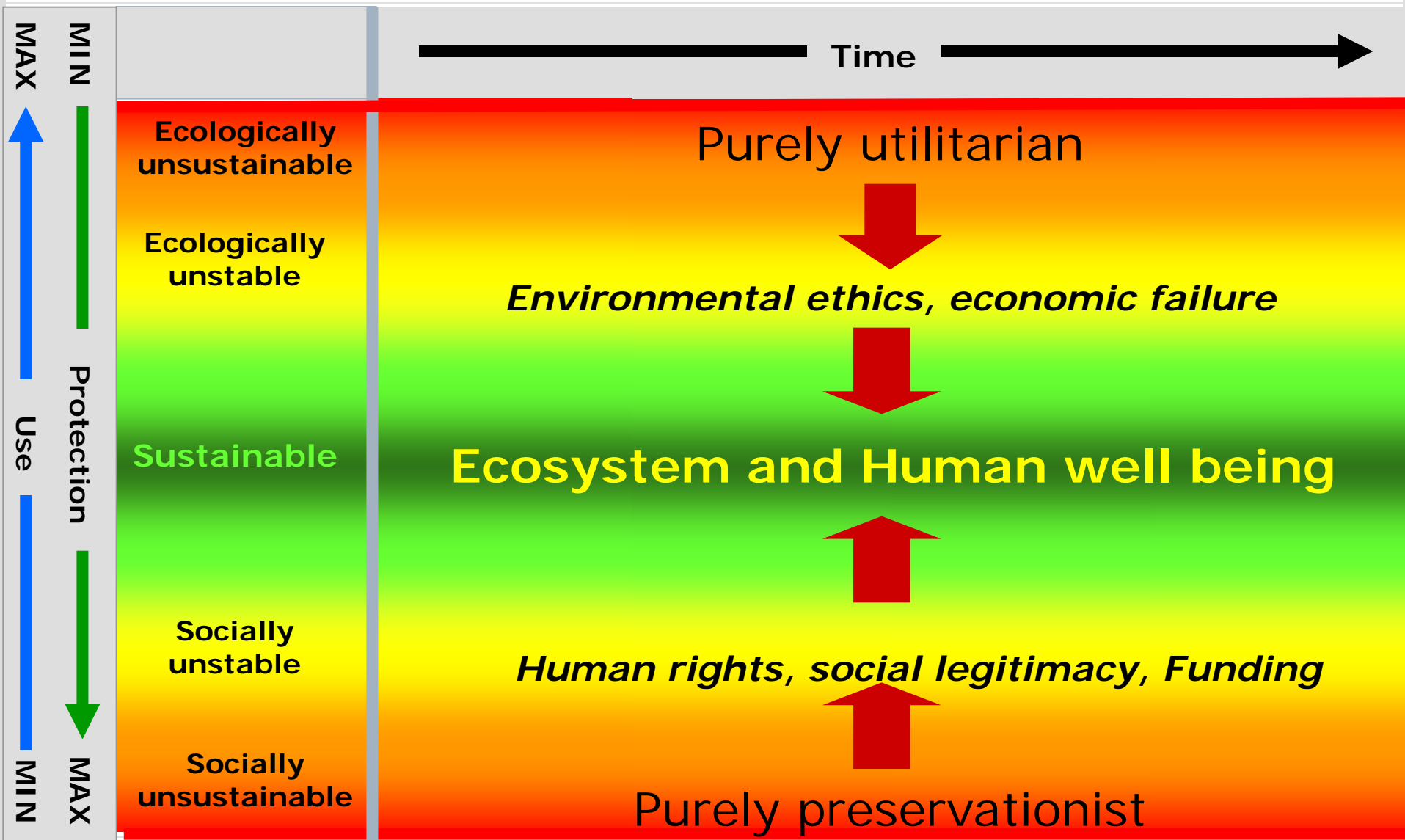


*Even railroad  
tracks seem to  
meet...  
...on the horizon.*

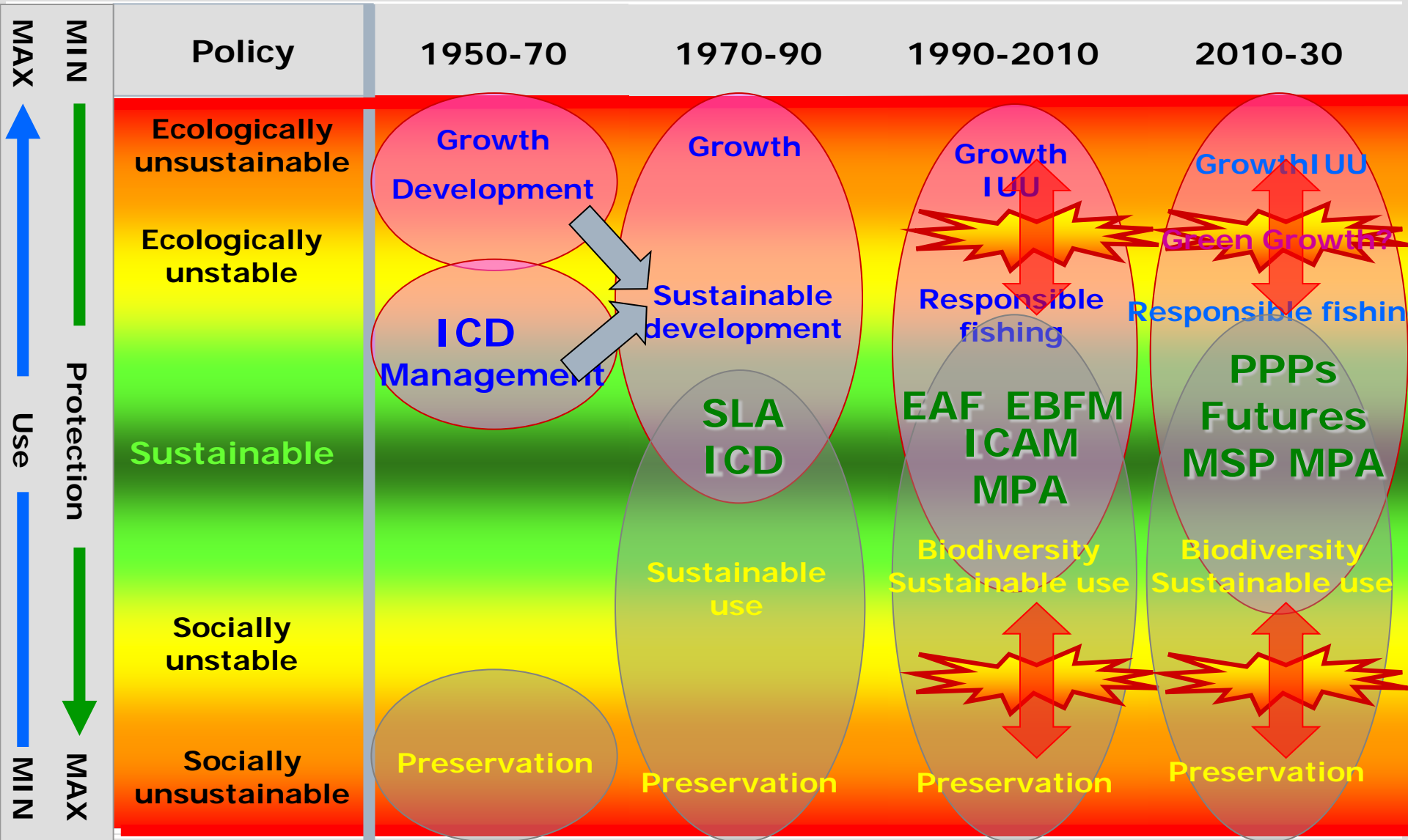
# 2.1 Sustainability barometer



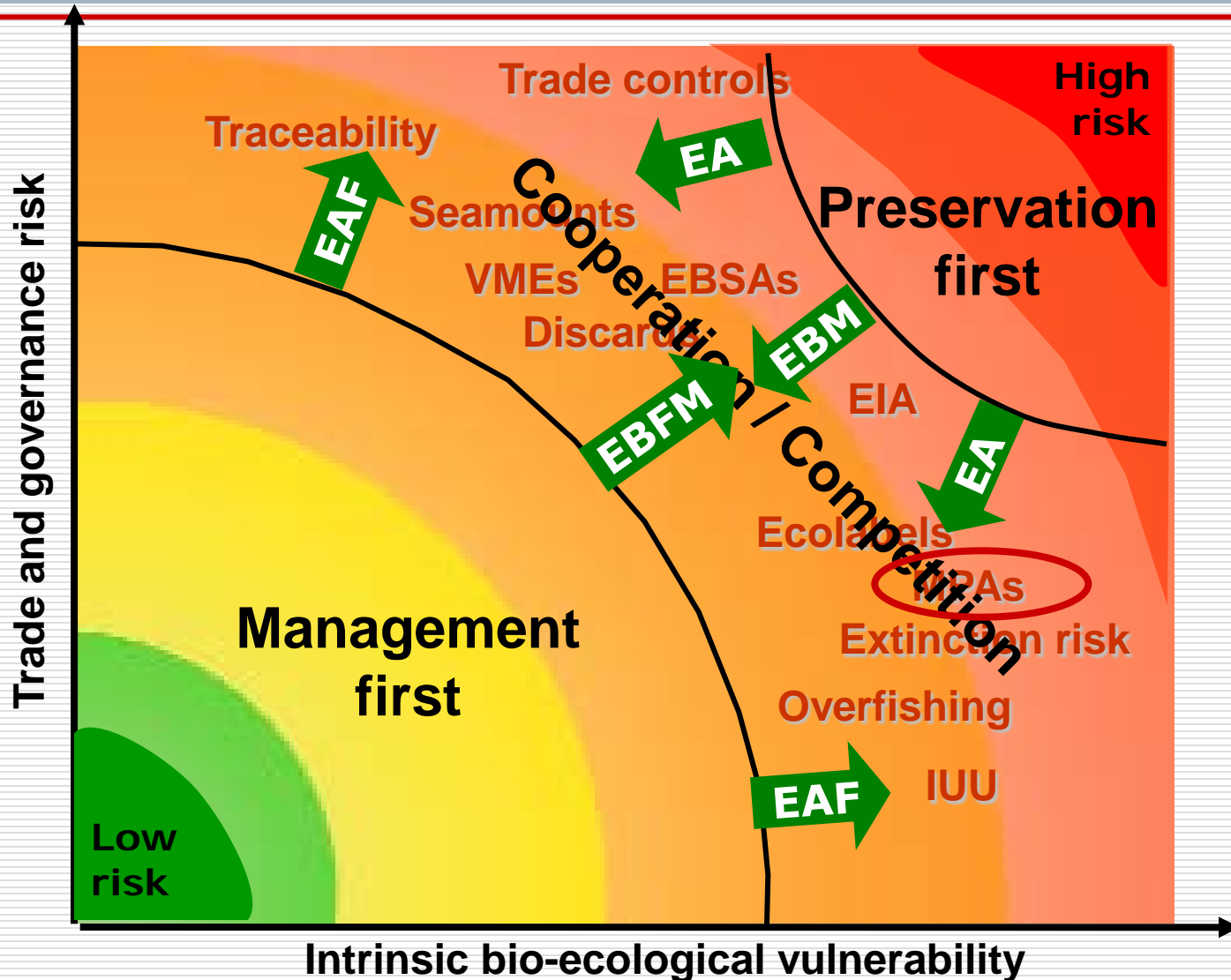
# 2.1 The evolutionary field



# 2.3 Converging evolutions

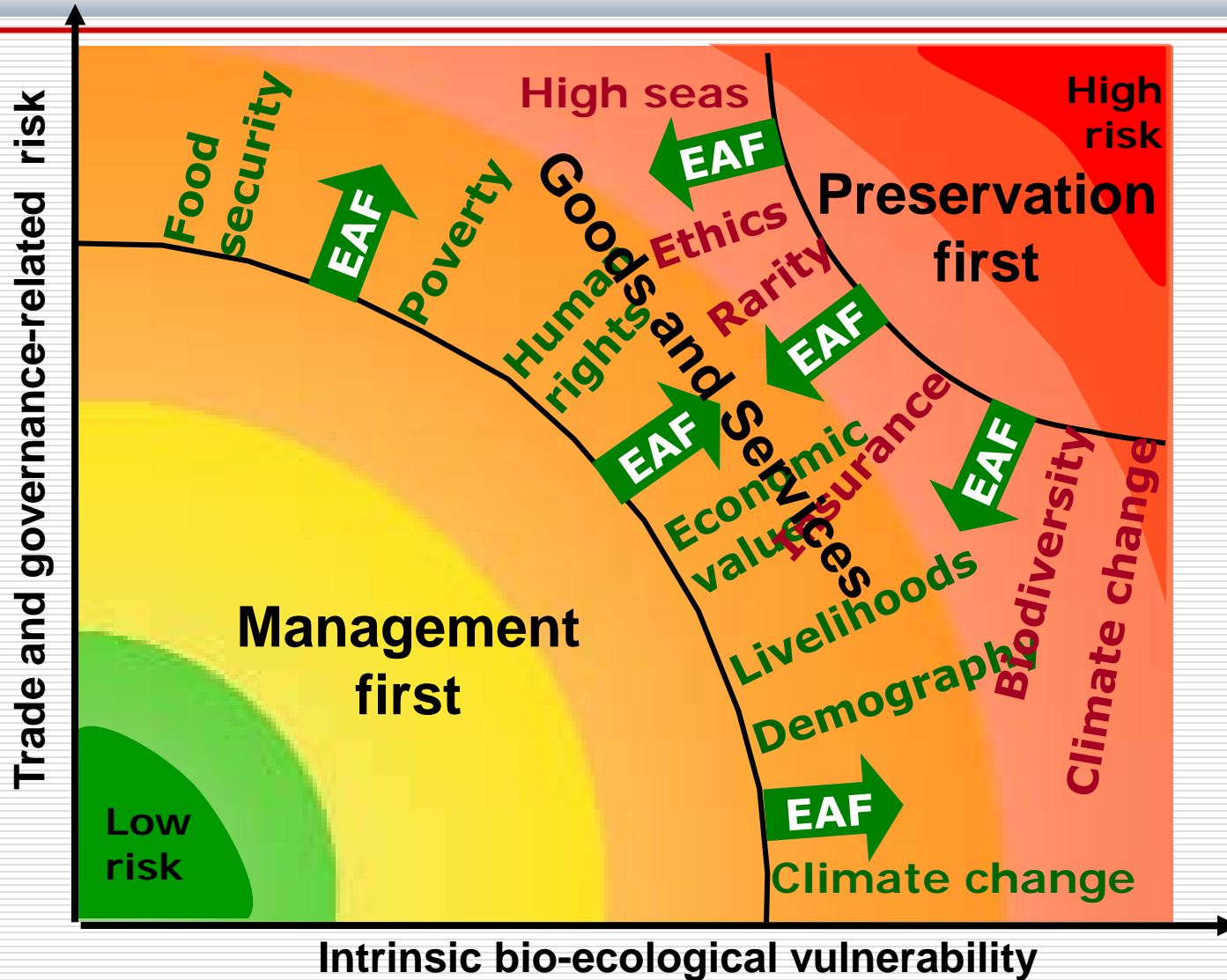


# 2.4 Institutional tensions





# 2.4 Institutional tensions



# 2.5 Outcomes

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- Convergent high level outcomes
  - Common concepts and vocabulary
  - Identification of common problems and constraints
  - Progressive integration of the “discourse”
  - Parallel institutional developments
  - Etc.
  
- Divergences at local and operational level
  - Different trade-off preferences
  - Different risk perceptions
  - Inequitable redistribution of costs & benefits
  - Institutional confusion
  - Etc.

# 2.10 Non-coherent policies

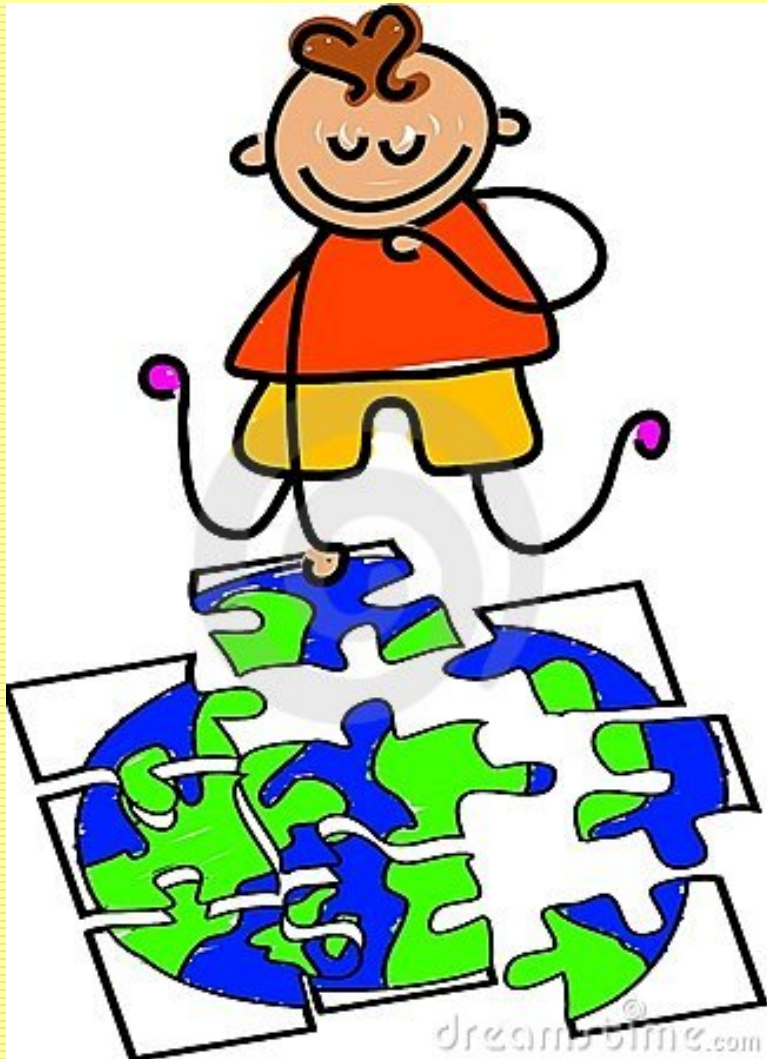
Thematic areas	Biodiversity	Food security
Harvest rate	<i>Reduce</i>	<i>Max Sustainable</i>
Low trophic levels	<i>Fish less</i>	<i>Fish more</i>
High productivity areas	<i>Protect more</i>	<i>Fish more</i>
Aquaculture strains	<i>Limit</i>	<i>Expand</i>
Freshwater culture	<i>Limit</i>	<i>Expand</i>

The measures needed for biodiversity conservation will reduce the contribution of fisheries to improve food security and vice versa.

The risk is that the areas protecting their biodiversity import their sea food from poorly managed areas.

The major risk is that, without a joint framework, both governance systems will fail to reach their main objective

# 3. MPA definitions



*The ultimate  
global puzzle*

# 3.1 Zoning connandrum

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- **Rights-based delimitations:** EEZ, High Seas, Territorial waters, Protected Fishing Zone;
- **Sectoral separation:** 3 miles coastal exclusion zone; oil fields; windmills; Telephone cables; navigation channels; pipelines; dumping areas; defense areas
- **Fishery conservation areas:** closed areas: nurseries, juvenile or spawning concentrations; special habitat (sea-grass beds, mangroves)
- **Biodiversity protection areas:** biosphere reserves, marine parks, wetlands, sanctuaries, protected areas,

All these areas may be identified and must be enforced but not all are MPAs  
*sensu* IUCN

## 3.2 MPA definitions

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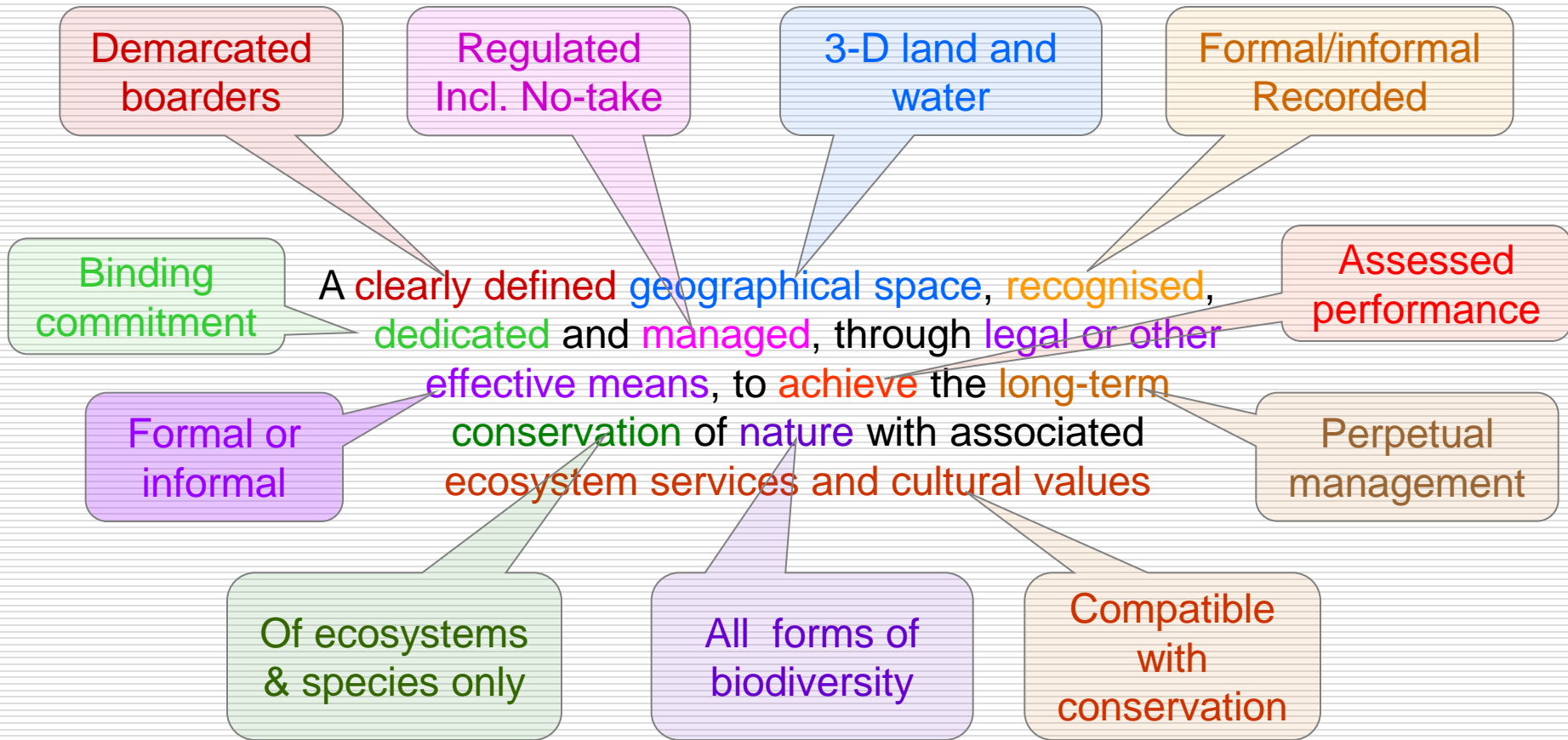
- **PA:** Area of land and/or sea especially dedicated to the **protection and maintenance of biological diversity**, and of natural and associated cultural resources, and managed through legal or other effective means (*IUCN, date?*).
- **MPA:** Any area of **intertidal or subtidal terrain**, together with its **overlying water** and associated flora, fauna, **historical** and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment (*IUCN, Kelleher and Kenchington 1992; Kelleher 1999*).
- **MPA:** An area of the sea...designated ...for ... **conservation** and protection of: (i) commercial and non commercial fishery resources incl. mammals and their habitat; (ii) endangered and threatened species and their habitats; (iii) unique habitats; (iv) areas of high biodiversity or biological productivity... (*Canadian Ocean Act 1996*)

## 3.2 MPA definitions

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- **MCPA:** Any defined area **within or adjacent** to the marine environment, together with its overlaying waters and associated flora, fauna and historical and cultural features, which has been reserved by legislation or other effective means, **including custom**, with the effect that its **marine or coastal biodiversity** enjoys a **higher protection level than its surroundings** (*CBD 2004*)
- **PA:** A **clearly defined geographical space**, recognised, dedicated and **managed**, through legal or other **effective means**, to achieve the **long-term conservation of nature** with associated **ecosystem services and cultural values** (*IUCN rev. Dudley 2008*)
- **MPA:** Any marine geographical area that is **afforded greater protection than the surrounding waters** for biodiversity conservation and **fisheries management** purposes (*FAO 2011*)
- **MPA Network:** A collection of individual MPAs or reserves operating cooperatively and synergistically, at various spatial scales, and with a range of protection levels, designed to meet objectives that a single reserve cannot achieve (*IUCN-WCPA 2008*)

# 3.4 PA principles & criteria





## 3.5 MPA categories

- **Ia Reserve:** Protection. Science. No use impact

States name areas. These names are not automatically recognized by IUCN as valid names. The WCPA validates the registration

**IV Habitat/species protection.** Conservation. Incl. habitat management: whale sanctuaries; seamounts; seagrass beds. Spawning, breeding, foraging areas. Recreational (very small-

No category compatible with industrial fishing?

MPAs in industrial fishing grounds: YES?. The converse: NO?

**VI Managed areas.** Conservation of ecosystems, habitats and cultural values; traditional NRM; Sustainable SSFs. Economic and social dimensions; Local communities; Sustainable livelihoods;

## 3.6 MPA principles & criteria

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- PAs must have **conserving nature** as primary objective. They should aim to maintain or increase the degree of naturalness of the ecosystem being protected (Contrary to **sustainable use**)
- PAs must prevent or eliminate exploitation or management practices harmful to the main objective.
- Assigning a PA to a category should be based on their stated primary objective(s).
- All categories make a contribution to conservation but not all categories are equally useful for conservation
- Using a diversity of categories is desirable and encouraged, to reflect the various facets of the PA concept
- The establishment of protected areas should not be used as an excuse for dispossessing people of their land (rights?)

## 3.7 Multiple-use MPAs

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- **Multiple use zones** are acceptable as MPAs if:
  - Clearly mapped;
  - Recognized by legal or other effective means; and
  - Having distinct management aims that can be assigned to a particular protected area category (i.e. conservation)
- **Nested MPAs:** e.g. areas III or IV nested in Areas V and VI
- **75% rule:**  $\frac{3}{4}$  of the area dedicated to the category objective. should not apply to category I to III. Depends on size?
- **Vertical zoning:** e.g. pelagic versus demersal rules.
- **Temporarily protected sites:** e.g. fishery boxes: would qualify as MPAs if they meet the category criteria

## 3.8 Non MPAs

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- All areas set aside for specific benefits of economic activities even if they have some conservation benefits: Wind farms, oil and gas extraction; fisheries (incl. refuges); community exclusive use; tourism; defence; disaster mitigation (anti tsunami, artificial reefs?), shipping lanes; etc
  1. Should not be automatically considered MPAs or parts of MPAs
  2. Should be examined case by case checking on conservation objectives and effectiveness.

## 3.3 Marine Managed Area (MMA)

- **MMA:** in the broadest sense, geographic areas designed to **protect or manage** resources within the marine environment (FGDC 2006).
- **MMA:** an area of ocean, or a combination of land and ocean, **where all human activities are managed toward common goals**. MMAs are a form of ecosystem-based management, where all elements—biophysical, human, and institutional—of a particular system are considered together (Orbach & Karrer 2010).
- An MMA can include vertical components of marine space: the seabed and **what lies below it**, the water column, the water surface, and **airspace**. The term **protected** is interchangeable with the term **managed (sic!)** (FGDC 2006)



## 3.3 Marine Managed Area (MMA)

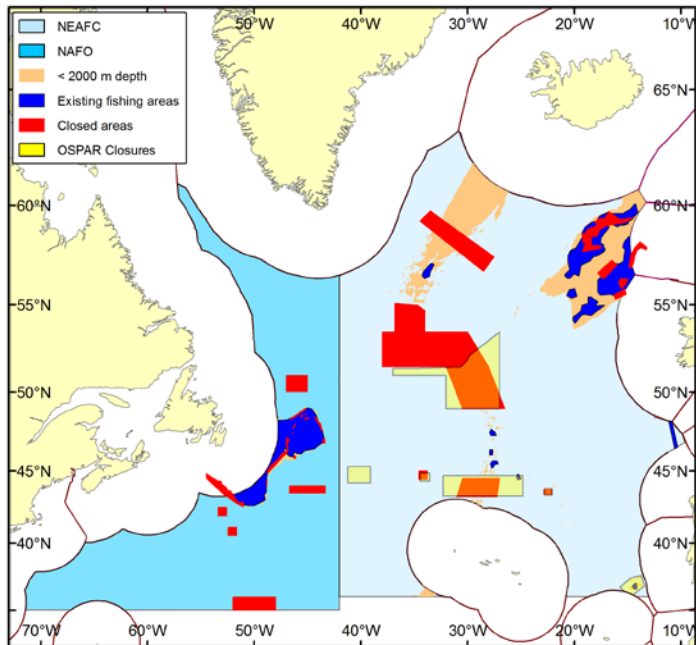
- **MMAs include:** marine sanctuaries; no-take areas; fishery management zones; national seashores; parks and monuments; critical habitats; wildlife refuges; aquatic preserves, and estuarine research reserves. **They include MPAs as well as areas not necessarily established primarily for conservation purposes (FGDC 2006).**
- **MMAs take many forms to address different issues and objectives with areas allowing:**

An MMA is a science-based, participative, multi-sectoral, integrated management area.

It allows a much broader range objectives than MPAs

- Only one specific use (e.g., local fishing) judged to be the most beneficial in that area to the exclusion of others.
- Multiple uses (e.g., fishing, tourism), allowed under specific circumstances;
- **MMA** is often used interchangeably with MPAs as including types of areas managed from **multiple-use to complete protection.**

# 4. Conclusions: MPAs & Fisheries






The use of MPAs in fisheries must be considered from two angles:

1. MPAs inserted in the fishery management tool box for fishery objectives
2. Fishing activities allowed within large MPAs established for conservation objectives

# 4.1 Fishing tolerance in MPAs

<b>Fishery Activities</b>	<b>Ia</b>	<b>Ib</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>	<b>VI</b>
Commercial fishing	Red	Red	Red	Red	Yellow	Green	Green
Recreational fishing	Red	Red	Red	Red	Yellow	Green	Green
Aquaculture	Red	Red	Red	Red	Yellow	Green	Green
Extractive research (trawl surveys)	Red	Yellow	Yellow	Yellow	Green	Green	Green
Fish aggregation, Artificial reefs	Red	Red	Yellow	Yellow	Green	Green	Green
Traditional fishing	Yellow	Green	Green	Green	Green	Green	Green

	Banned		Conditional		Authorized
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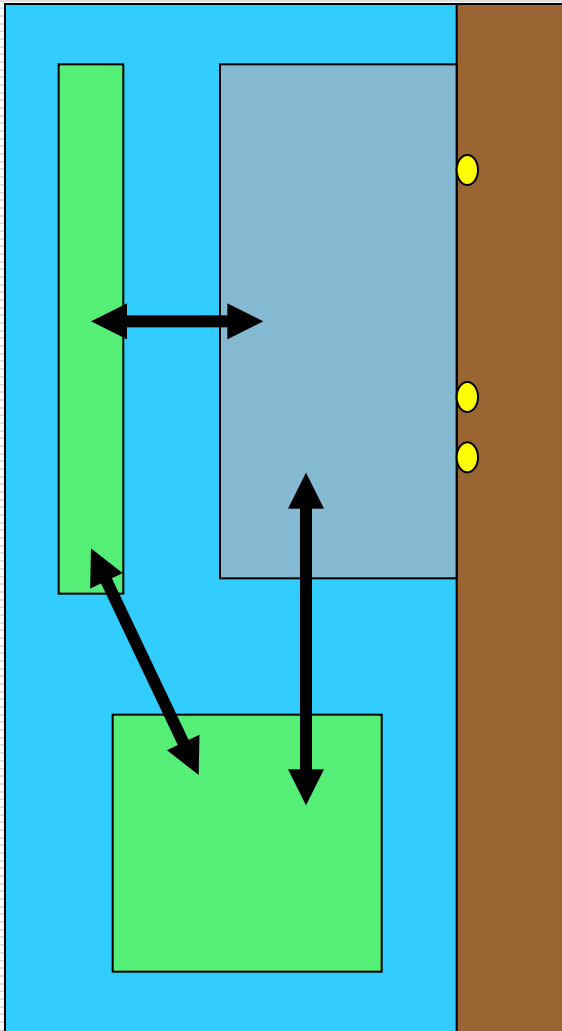
## 4.2 MPA tolerance in fisheries

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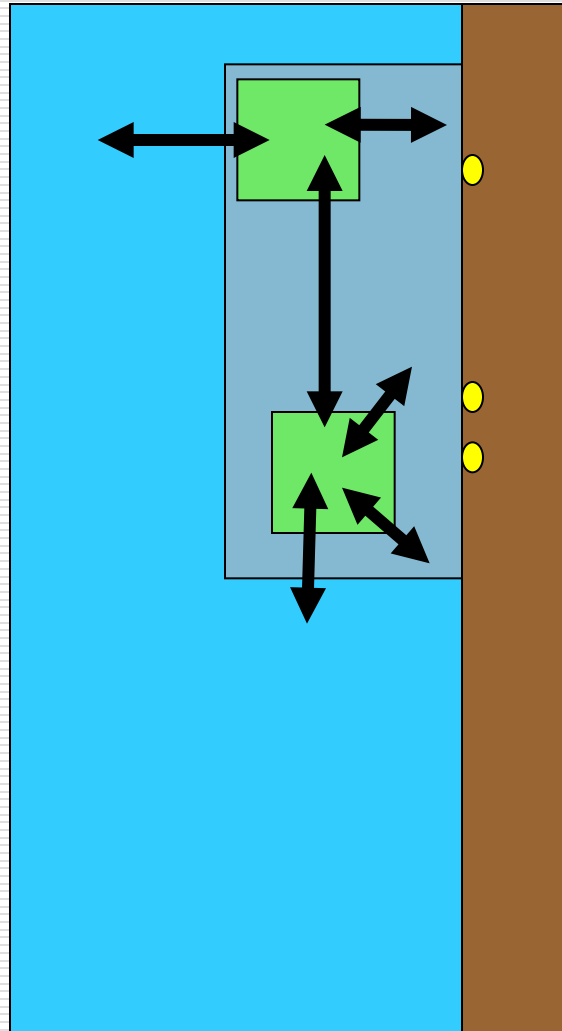
**MPAs are generally given the benefit of doubt and are considered part of the tool box. They may help:**

- reduce F in sedentary bottom stocks (data poor)
- Manage multispecies assemblages + habitat
- Minimize bycatch and discards
- Protect habitat/biodiversity (reduce collateral impact)
- Buffer against uncertainty
- **Decentralize management**
- **Protect cultures, practices and rights**
- **Resolve user-conflict**

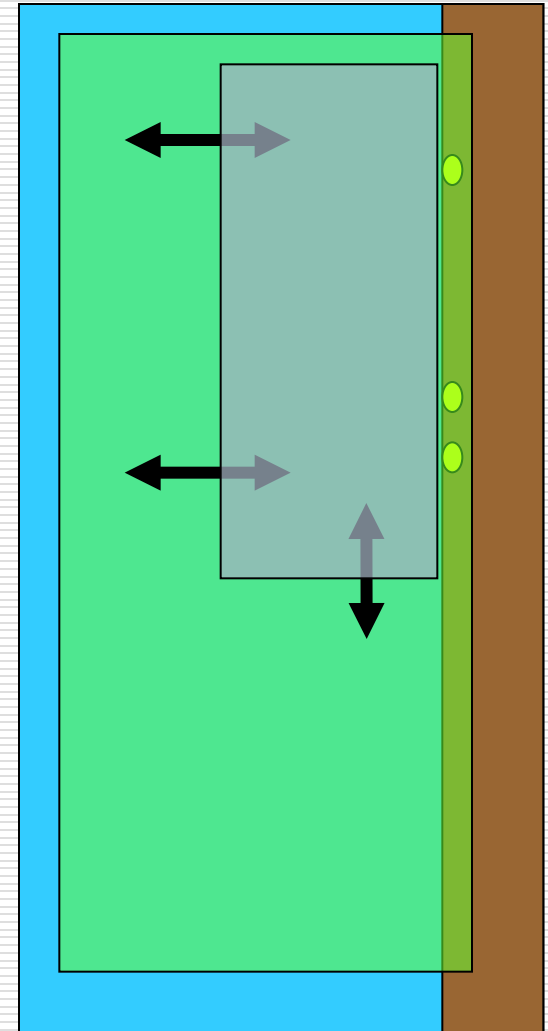
# 4.3 MPA-Fishery relations



Juxtaposition

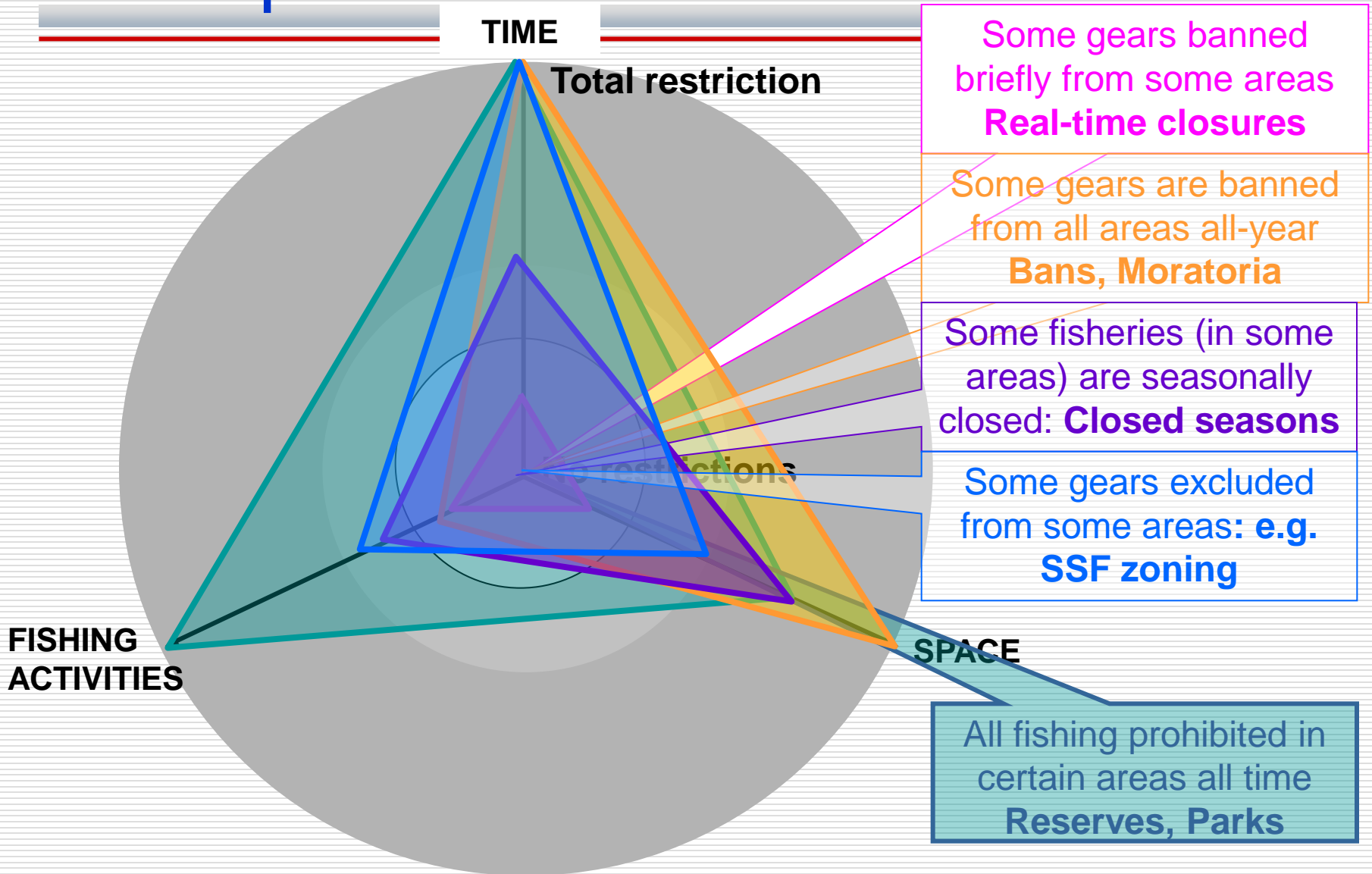


Insertion



Embedding

# 4.4 Space-time restrictions



# 4.5 Questions

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- What contribution “Fishery MPAs” can make to conservation?
- What contribution “Conservation MPAs” can make to fisheries?
- What fishery closure can be listed as MPA?
- Could FPAs and MPAs be jointly optimized in some areas?
- What could the process be?

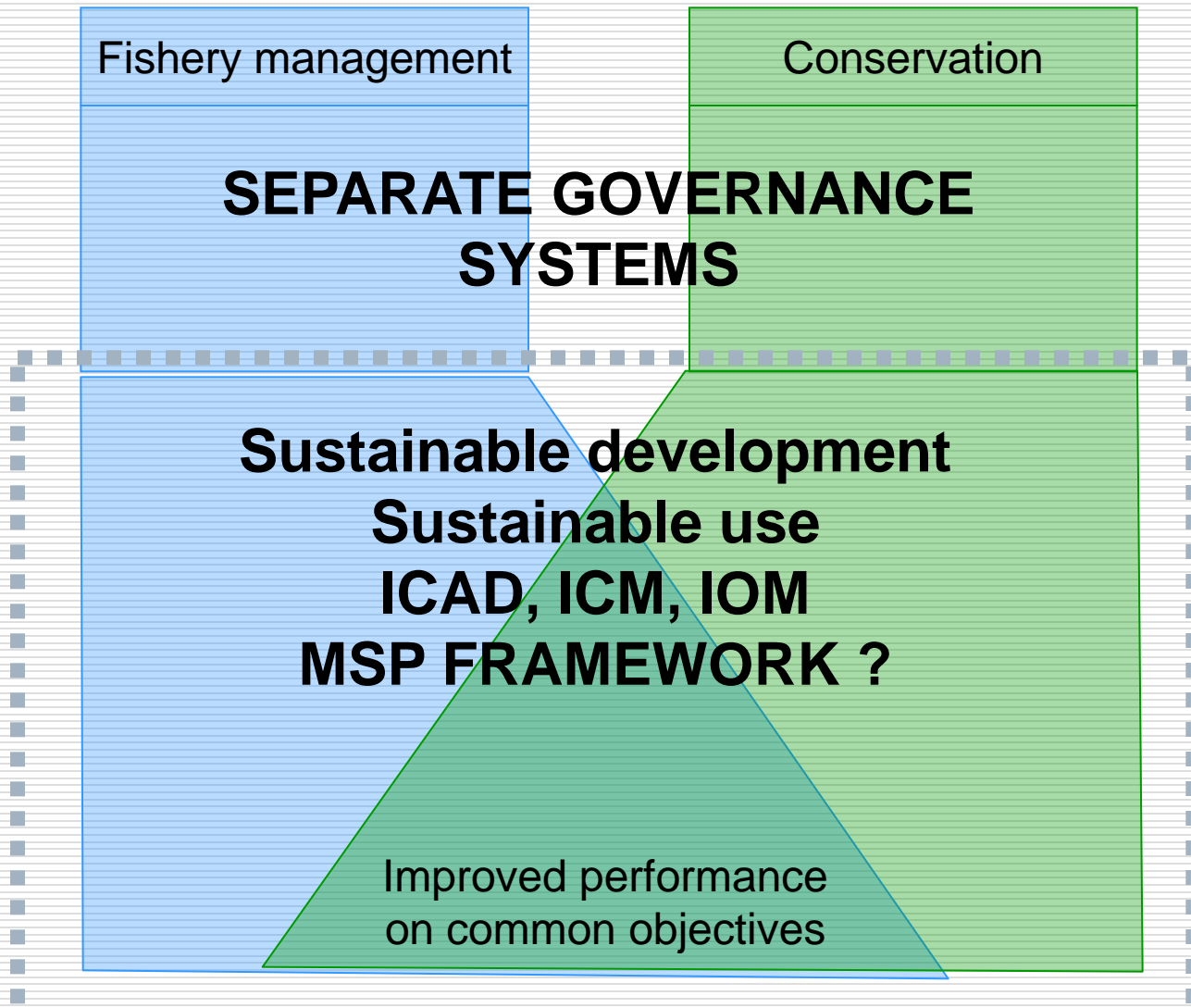
## 4.6 Standard tools may do better

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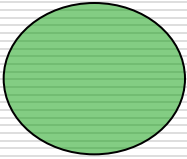
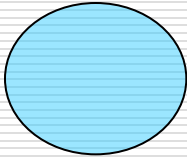
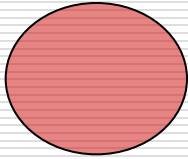
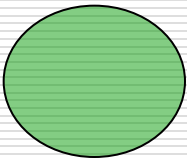
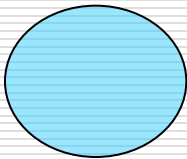
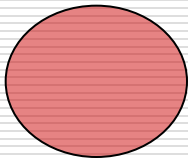
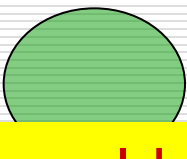
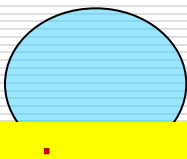
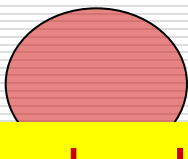
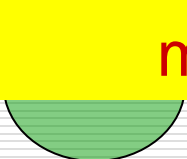
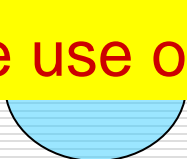
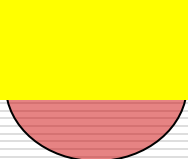
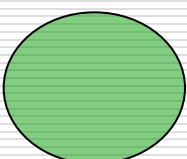
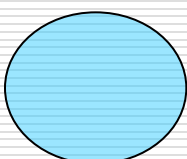
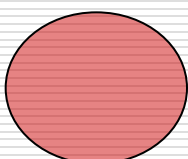
- *In situations where the resources for proper enforcement are lacking, alternative management regimes that are better able to meet a range of community goals may achieve greater acceptance, compliance, and subsequent conservation success than (MPA) systems designed primarily for national interests of tourism and biodiversity conservation.*
- *Although large, permanent MPAs may provide the best protection for species that are highly susceptible to overfishing, a combination of MPAs and alternative systems of management, such as traditional systems, may provide the best overall solution for meeting conservation and community goals and reversing the degradation of reef ecosystems within the center of coral diversity.*
- *McClanahan 2006*

A question will therefore often be: do MPA fare better than conventional tools and if yes, under which condition?

# 4.7 Towards synergy?



# 4.8 ICAD-Integrated process

PHASES	OBJECTIVES			OUTPUTS
	Biodiversity	Valuation	Fisheries	
SCOPING ↓				JOINT RESEARCH QUESTIONS AND ASSESSMENT PLANS
DATA COLLECTION FIELD SURVEY ↓				JOINT COLLECTION COMMON KNOWLEDGEBASE
DATA PROCESSING AND ANALYSIS ↓				INTEGRATED MODELS, OPTIONS AND SCENARIOS
PRE-IMPLEMENTATION MANAGERS AND STAKEHOLDERS ↓				INTEGRATED IMPLEMENTATION
MONITORING & EVALUATION				INTEGRATED M & E

Perhaps could we reinvent that wheel...and make use of it?

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**Thank you for your  
attention**