

Conservation and Sustainable Use of Biodiversity

Dr. Jake Rice, Chief Scientist
Fisheries and Oceans Canada
(helping out CBD Secretariat)

Points I will cover (all briefly)

- What is biodiversity and why should anyone care?
- What is happening to marine biodiversity and how do we know?
- What do “conservation” and “sustainable use” really mean?
- What are the threats to biodiversity
- What are some tools to address the threats?
- What are the important considerations in choosing a way forward?
- What have CBD Parties developed as a way forward?

What is (marine) Biodiversity and why should anyone care?

"Biological diversity" means the variability among living organisms ...; this includes diversity within species, between species and of ecosystems. (CBD)

Rio + 20 recognizes biodiversity as “Critical for sustaining [the Earth’s ecosystems]” with “contributions to poverty eradication, sustained economic growth, food security and creation of sustainable livelihoods and decent work (Paragraph 152).

Important services provided by biodiversity include:

- Phytoplankton produce between 50 and 85% of the earth’s oxygen
- Ocean plankton *Naturally* take up perhaps a third of the carbon dioxide produced by human activities annually.
- Human food security, wealth, employment, and subsistence livelihoods Natural barriers to ocean energy (storms, waves)
- Existence values – ethics, aesthetics, cultural and spiritual values

WE NEED THE WHOLE HEALTHY AND FUNCTIONING NORMALLY IF WE ARE GOING TO USE THE PARTS FOR HUMAN WELL-BEING.

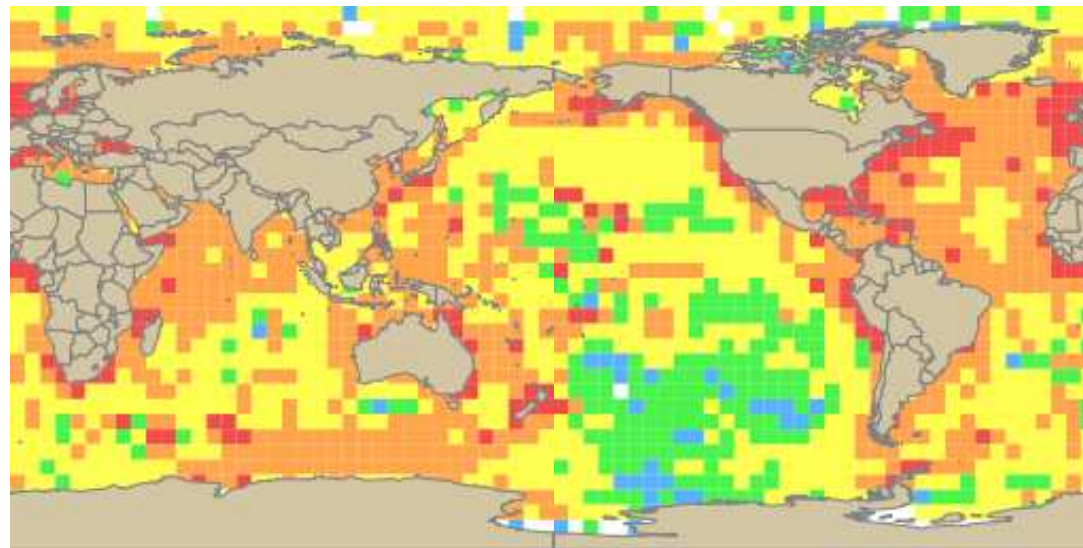
Rio+20 recognizes

We actually haven't sampled what is out there very thoroughly

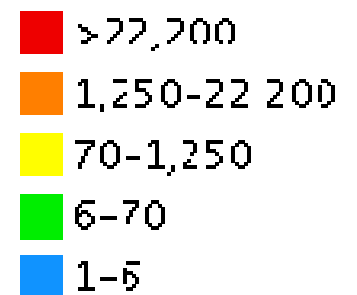
OBIS is a global repository of data on marine biodiversity, created as part of the Census of Marine Life, and now overseen by IOC.

Even coastal sampling is not great in many places.

* Figure from OBIS website, used with permission



Number of records



What is happening to marine biodiversity?

Most global marine and assessments that have been conducted during the last few years have found serious declines in marine living resources, losses of coastal habitats,, and overall deterioration of the marine environment.

Examples of key habitats and species groups extracted from CBD (2010)

Mangrove	20% lost	1980-2005
SeaGrasses	30% lost	1879-2009
Salt Marsh	25% lost	To 2010
Coral Reef	19% lost 35% at risk	
Zooplank.	No global	estimates
Exploited fish	63% below targets	2010 SOFIA
Non-expl fish	Speculative & divisive	
Seabirds	60% decline	To 2005
Whales	70 – 90 % decline	To 2005

What do we mean by conservation and sustainable use

There is a definition for anyone's preconception.

Focus here on properties common to most definitions.

Conservation – Ecosystem or population

- Does NOT have to be in pristine state
- Is NOT at risk of local extinction or long-term decline
- Is able to play “typical” role in ecosystem processes

Sustainable use –

- Impacts of use are known and under management control
- “Recovery” from impacts expected to be secure and ecologically rapid (taking life histories into account)
- Sustainability has 3 (4?) dimensions:
 - Ecological, economic, social, institutional (governance system)

What are the important considerations in choosing a way forward?

- How well do we understand the impacts
 - Is management treating causes or treating symptoms?
 - Is management reacting to signal or reacting to noise?
- How reliable is the tool at fixing the problem?
 - Take account of positive bias in reporting on effects of measures
 - Be aware that ecosystem responses may be context specific.
 - Are other pressures going to negate benefits?
- What else will the tool do?
 - Does it have other ecosystem effects?
 - Are the social and economic consequences known and acceptable to those who will bear them?
- Is every interest pulling in the same direction?
 - Which other sectors are also impacting the ecosystem features

What are the threats to biodiversity?

Many – with rankings criterion-dependent

- Overfishing and habitat destruction are usually considered greatest past threats. Fishing has multiple impacts:
 - Target species – Challenges are at level of assessment accuracy and & management effectiveness
 - Bycatch and habitat impacts – Additional challenges in allocating accountability for impacts
 - Food web effects – Additional challenges with accountability and with proper framework for evaluation
- Climate change and acidification increasing in salience
- Ocean Fertilization (paragraph 167) – a fading promise.
- Pollution, nutrients and contaminants, esp. in coastal areas.
- Alien Invasive species, esp. coastal areas & enclosed seas
 - Increasing recognition, increase or looking harder?

MULTIPLE PRESSURES ALMOST EVERYWHERE (Halpern et al. Science 2008; 319:948-952)

What tools are available to address undesired impacts? Also MANY

- Better monitoring and assessment
 - Methods known – coverage and cost issues are main concern
 - Assessments of status AND of Impacts (EIA and SEA)
- More effective control and surveillance (MCS) of fishing
 - Technology, Co-management, Policy are all useful to improve MCS
- Better incentives for responsible behaviour (**Essential** for progress)
 - Allocation of rights, certification, others: best options scale dependent
- Spatial tools – MPAs and other means; effectiveness case-specific
- Environmental engineering of technologies
- Land-based effects a real challenge!

All tools have multiple consequences; just like pressures they are used to manage.

With multiple threats and diverse tools to address them, we need effective ocean governance to be efficient & effective. (para 162)

Strategic Plan for Biodiversity 2011-2020 adopted by COP 10 (Oct, 2010, Nagoya)

Framework for all Conventions and stakeholders.

Vision: *Living in harmony with nature.* By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people.

Mission Take effective and urgent action to halt the loss of biodiversity in order to ensure that by 2020 ecosystems are resilient and continue to provide essential services, thereby securing the planet's variety of life, and contributing to human well-being, and poverty eradication

20 Aichi Biodiversity Targets (marine ones paraphrased in following slides.

Implementation mechanisms



Aichi Biodiversity Targets with specific relevance to marine and coastal biodiversity: BY 2020

- **Target 6:** All fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits (Full quote)
- **Target 7:** Sustainable management of agriculture, aquaculture and forestry
- **Target 8:** Pollution is not detrimental to ecosystem function and biodiversity.
- **Target 9:** Invasive alien species and pathways identified, controlled, and pathways managed
- **Target 10:** Pressures on coral reefs, and other vulnerable ecosystems minimized

Aichi Biodiversity Targets with specific relevance to marine and coastal biodiversity

- **Target 11:** ..._10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes (quote)
- **Target 12:** extinction of known threatened species has been prevented and their conservation status has been improved and sustained.
- **Target 14:** Restore and safeguard ecosystem services
- **Target 15:** Restoration of at least 15% of damages ecosystem

Aichi targets are OUTCOMES to which Parties have subscribed

- Outcomes all consistent with Rio+20 vision.
- We have many tools from which to choose.
- We know HOW to assess status, trends and impacts.
- But we need more and better information and capacity for those assessments.
- We need coherence and coordination among sector regulatory agencies in applying solutions.
- We need strategies that solve problems for people AND for biodiversity.
- We need ambition, vision, courage and patience.