Restoring our contract with Nature and the Ocean Commons

Climate change, pollution and humanity’s voracious consumption of marine life is annihilating life in the oceans, reports MIKE McGINNIS. To restore the oceans and the life they sustain requires that we recover our contract with Nature’s Commons, establish large networks of marine protected areas and markedly reduce our consumption of marine life to a more equitable share. Making the connection between the health of the oceans and human well-being is key to ensuring ocean life continues to flourish. We must support the life-giving qualities of a living ocean planet instead of the short-term values of maximizing financial return and over-exploiting marine life.

The pieces must stick within their pattern or the whole thing collapses and the design is gone. We wonder whether in the present pattern the pieces are not straining to fall out of line; whether the paradoxes of our times are not finally mounting to a conclusion of ridiculousness that will make the whole structure collapse. JOHN STEINBECK

Coastal marine ecosystems worldwide are threatened by the cumulative effects of the global impacts of climate change and the global scale of the economic consumption of marine life. The Gulf of Mexico oil catastrophe last year during the United Nation’s International Year of Biodiversity, and the death of hundreds of thousands of fish, birds, turtles, mammals, and other marine life warns of yet another threat to ocean life, unwise energy developments.

The International Union for the Conservation of Nature’s Red List of Threatened Species identifies at least 1,141 of the 5,487 mammals on Earth that are known to be threatened with extinction. One in four marine mammals is in jeopardy. The Global Biodiversity Outlook notes that nearly 50 percent of all species could disappear within the lifetimes of people now living on Earth.

Unique and sensitive marine ecosystems, like the Ross Sea of the Antarctic are showing signs of major decline. Essential marine species, such as phytoplankton, have declined to the point where major changes in the world’s marine ecosystems have occurred over the past century. Phytoplankton biomass is a critical indicator of the general health of marine ecosystems, and is a major producer of oxygen which all life depends on for survival on the planet.

A study conducted by scholars at Stanford University’s Centre for Oceans Solutions in 2008 reviewed over 3,400 peer-reviewed articles describing the various pressures on the Pacific Ocean, and identified four primary threats: pollution, over-fishing, habitat destruction and climate change. To date, over 425 scientists around the world have signed a consensus statement corroborating the findings of this centre’s report. At every level of the food web there is evidence of dramatic decline in the general health of coastal marine ecosystems.

One response to the biodiversity crisis is the creation of a new international initiative, The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services or IPBES. A goal of the IPBES is to assist in organising a more comprehensive global response to protect ecosystems ‘that underpin all life, including economic life.’ Making the connection between the maintenance of coastal and marine biodiversity (or more specifically, native species diversity) and human well-being is a key factor in forging a more sustainable future. It is important to recognize that human beings cannot control ocean currents and ecosystems. We can only manage human behavior and the associated impacts on ecosystems. Without significant institutional innovation and dramatic change in the human use and impact on coastal marine ecosystems we can expect further decline in the health of coastal marine ecosystems.

Recent Marine Protection Developments
A wave of interest in marine ecosystem-based planning has emerged highlighting the principles of ecosystem health and integrity, adaptation, sustainability, and precaution. A number of initiatives are developing that focus on integrative marine policy-making, marine zoning, large marine ecosystem (LME) planning, integrative coastal zone management, and spatial planning. National ocean frameworks are developing in France, US, UK, Canada, Vietnam, Japan, Australia, Brazil, China, Germany, Jamaica,
the Russian Federation, the Netherlands, Norway, Portugal, India, Mexico, and the Philippines. This increasing interest in ecosystem-based, integrative planning and marine zoning often supports using collaborative and participatory decision-making that includes scientific experts and has important roles for indigenous peoples. Many efforts support a place-based approach to ecosystem planning, emphasizing stakeholder-based and community-based planning, and the role of local knowledge in decision-making.

President Obama signed an Executive Order (EO) for the Stewardship of Our Oceans, Coasts and Great Lakes on July 19, 2010, supporting the Final Recommendations of the Ocean Policy Task Force. The EO states: ‘This order also provides for the development of coastal and marine spatial plans that build upon and improve existing Federal, State, tribal, local, and regional decision-making and planning processes.’ The Obama Administration established a National Ocean Council (NOC) to assist in developing regional, science-based integrative frameworks for coastal and marine spatial planning. The regional approach will be based on large marine ecosystems, and build on existing regional plans, like the West Coast Governors’ Agreement on Ocean Health.¹²

Another project addressing the plight of the oceans is the Pacific Ocean 2020 Challenge Initiative which started in July 2010. The governments of California, Fiji, Micronesia, Solomon Islands, Tonga, Tuvalu and Vietnam are collaborating and sharing information on various regional, national and local initiatives, such as the West Coast Governors Agreement on Ocean Health (WCGA), the Coral Triangle Initiative, the Micronesia Challenge or the Pacific Oceanscapes. This collaboration calls for new intergovernmental and international efforts to address the major crisis in the state of the Pacific Ocean by 2020. A key component of this initiative is the importance of scaling-up the level of marine life protection across the Pacific Ocean.

Up-scaling Marine Protected Areas
Establishing networks of marine protected areas or MPAs, is an important facet of this increased interest in marine governance across the Pacific Ocean. If designed correctly MPAs are an important regulatory strategy to curb over-exploitation of coastal marine resources and potentially mitigate climate change impacts. The numbers of marine reserves to increase biomass and native species diversity in coastal marine ecosystems are rapidly increasing worldwide. MPAs encompass a range of protection levels, from fully protected no-take reserves to restriction of only

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**PRESSURES ON MARINE ECOSYSTEMS**

- Natural Coastal Marine Disturbance Regime
  - Storms
  - Oceanographic Regime Shifts
  - Change in Biogeography
- Fishing
  - Coastal Land Use
  - Pollution
  - Marine Vessels
  - Introduction of Non-native Species
  - Habitat Destruction
- Anthropogenic Climate Change
  - Change in Sea surface Temperature
  - Sea Level Rise
  - Increase in Ocean Acidification
  - Change in Biogeography
- Change in Coastal and Marine Ecosystems

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particular activities, such as a type of fishing activity. Substantial evidence shows that within areas protected from consumptive activities, e.g., fishing, rapid increases in abundance, size, biomass, and biological diversity occur virtually regardless of where reserves are sited.

Scientists have studied over 124 marine reserves in at least 29 nations and territories around the world and monitored biological changes inside the reserves. A summary of the major findings follows:

- A growing body of literature documents the effectiveness of marine reserves for conserving habitats, fostering the recovery of over-exploited species, and maintaining marine communities;
- Networks of marine reserves, where the goal is to protect all components of the ecosystem through spatially defined closures, should be included as an essential element of ecosystem-based planning;
- Marine reserves, together with conventional fisheries management strategies, have significant ecological benefits. Reserves may allow targeted species to rebound, increasing local recruitment and contributing to spill-over of adults and export of larvae into fished areas.
- Reserves may protect critical life stages and spawning aggregations of targeted species;
- Reserves may provide insurance and resilience in an uncertain world with unpredictable environmental fluctuations.
- No-take marine reserves can enhance species diversity, biomass, abundance and size of marine animals;
- Case studies of no-take marine reserves show positive spill-over effects from reserves into fishing areas; and
- Reserves designed to protect ecosystem biodiversity can also protect fisheries.

Few MPAs are closed to all activities. Most are open for recreational use and others allow commercial and sport fishing. Currently, less than 1 percent of the world’s oceans are closed to fishing. The debate on the use of reserves as a fish management tool remains an issue dividing members of the scientific community. Also, few conservation organizations are willing or able to take on the powerful interests of commercial and recreational fishing organizations in the politics of marine conservation. A fundamental problem remains; there is a lack in most places of an ocean constituency to support the preservation of marine life.

While the extent of MPAs has grown significantly, the Parties to the Convention on Biological Diversity (CBD) have generally failed to designate the minimum levels of MPAs by end of 2010. A small proportion, less than a fifth, of marine ecoregions meet the target of having at least 10% of their area protected. MPAs cover approximately half of one percent of the total ocean areas, and 5.9 percent of territorial seas (to 12 nautical miles offshore). For example, New Zealand, a country branded as an ecologically progressive country, has set aside less than 1% of its marine area as MPAs. By the end of 2010, only 0.3% of the Exclusive Economic Zone and 7.6% of the territorial sea is protected in some type of MPA, but most of this protection exists in the Kermadec Marine Reserve and in the Auckland Islands Marine Reserve. These two areas represent approximately 99% of the total existing area under protection in New Zealand marine waters. Although the 2010 target for protected areas was that 10% of each biogeographic region and habitat should be protected, scientists and conservationists consider the MPA target should be considerably higher, possibly up to 30%. Few countries have set aside this level of marine habitat within a network of MPAs.

Examples of MPA networks

**Micronesia:** a joint commitment to conserve at least 30% of nearshore waters and 20% of their terrestrial resources by 2020.

**Fiji:** commitment to implement a network of marine managed areas representing 30% of its Exclusive Economic Zone (EEZ) by 2020.

**Australia:** by 2005, there were 214 MPAs, and about 7.5% of the EEZ is protected, of which 3% is no-take. Australia has the world’s second largest MPA, the Great Barrier Reef Marine Park.

**Indonesia:** supports a target to gazette 10 million hectares of its waters as MPAs by 2010, and 20 million hectares by 2020.

While scientists recommend that marine biodiversity protection requires increased protection levels, few government reports or articles support reducing the economic use of marine resources. Yet to sustain marine ecosystems, a much broader scale and deeper perspective is needed than merely fostering the instrumental value and use of marine life.
Down-scaling marine resource use

The enormous scale globally of humanity’s economic use of marine life should be recognized as a major challenge to the survival of marine life. While the scale of marine protected areas remains an issue of political and scientific debate, the increasing economic use of marine life continues to be a ‘sacred cow’ in the growth-oriented marine management sector. A large share of fish production enters international marketing channels, with about 37% (live weight equivalent) exported in 2008. A majority of the world’s fisheries surpassed sustainability in 1988.

The basis of the marine food chain has been fished-out by substantive removal of large marine predators from most of the world’s oceans. Commercial fishers are fishing down the food chains of the world’s oceans - fishers have shifted to species like sardine, squid, and mackerel. Over-use of a fish species to the point of biological and economic collapse is well documented, and continues to have cultural impacts on maritime communities. Jeremy Jackson and colleagues describe the history of the collapse of marine ecosystems:

Over-fishing and ecological extinction predate and precondition modern ecological investigations and the collapse of marine ecosystems in recent times, raising the possibility that many more marine ecosystems may be vulnerable to collapse in the near future. [my emphasis]

Multinational industrial fishing is more like mining than fishing. It is a combination of government subsidy, the size of commercial fishing vessels, and the technology employed that contributes to both the decline of local, small-scale and artisanal fishing activities and to major ecological impacts on coastal marine ecosystems.

Often, those in support of continued over-use of the oceanic commons fail to recognize the crucial values of large-scale conservation measures. In the U.S., for example, the concentration of commercial interests in ‘fishery’ management and planning has supported the industrial use values of fished species while much broader and more ecological encompassing ‘community’ values have been sacrificed by government elites. Calls for greater levels of marine biodiversity protection run up against the global scale of marine resource use. While scientific knowledge supports large-scale measures to protect marine biodiversity, ocean governance often perpetuates the unsustainable and inequitable use of marine life.

For example, California’s history of commercial fishing activity is symptomatic of the loss of the ‘big fish’ across the world’s ocean. There are over 285 species fished and landed commercially (and recreationally) along the California coast. The history of commercial fishing in California has followed a pattern of boom and bust. Since the late 1980s, a majority of the top commercially fished species from California are major exports. California Market Squid (Loligo opalescens), for instance, is ranked as the state’s largest commercial fish landed by volume. The growth of this fishery is based on the demand of Asian and European markets, as a vast majority of the squid is exported to China and European markets. Among US exports of commercial fisheries in 1999, Market Squid ranked sixth by volume and sixteenth in value, higher than any other California commercial fish. Ironically, most of the caught squid is from a designated national marine sanctuary, the Channel Islands National
Marine Sanctuary (CINMS). During the past twenty years, the marine areas around the Channel Islands have provided a great majority of the squid landings.

There is no reliable scientific information on the abundance and distribution of squid species; there is a paucity of ecological information on the existing biomass or status of Market Squid populations. Nevertheless, the fish management plan for Market Squid was set by the California Department of Fish and Game at a seasonal catch limitation of 118,000 tons, which was coincidentally the highest landing for the fishery during 1999-2000. The fish plan fails to consider the fact that the presence and abundance of squid in southern California marine areas are of vital importance for millions of fishes, birds, and mammals which compete for this resource with human beings. The Market Squid is a principal forage item for at least 19 fish species, 13 bird species and six species of mammals. The recent designation of MPAs in the marine areas of southern California have had no impact on Market Squid landings. It is very clear that the huge increase in use of marine resources over the past twenty years is inconsistent with the need to increase levels of protection for marine life.

Toward Recovering the Commons
These two apparently conflicting factors contribute to the politics of marine biodiversity protection: the scientific realization that highly valued marine ecological processes and species must be preserved in large networks of marine protected areas; alongside the awareness of governments of the high economic value which many ecosystems high in biodiversity provide, for example, Market Squid.

To overcome this impasse, this article offers an ambitious ecologically-oriented mission and points out the need to integrate marine conservation strategies, including large networks of MPAs with a more ecologically sustainable and equitable allocation of coastal marine resources. Down-scaling the economic production and consumption modes of marine resources will support the importance of a more equitable allocation of so-called ‘common pool resources.’ As poet Gary Snyder writes,

[W]e need to make a world-scale ‘Natural Contract’ with the oceans, the air, the birds in the sky. The challenge is to bring the whole victimized world of the ‘common pool resource’ into the Mind of the Commons … [T]here is no choice but to call for the recovery of the commons, and this in a modern world which doesn’t quite realize what it has lost.

The quest for a ‘recovery of the oceanic commons’ requires a fundamental shift in values to primarily supporting the life-giving qualities of a living ocean planet rather than the short-term value of maximizing financial return and resource use from the sea. Marine biodiversity protection is not just about protecting enough quality marine habitats, it’s about reducing the economic scale of resource use. Several economic-oriented principles supporting strategies to conserve marine biodiversity include the following:

INTEGRATING ECOLOGY, ECONOMY AND EQUITY

Ecology

- The maintenance of Ecological integrity and health
- Multiscalar system governance
- Ecological Sustainability
- Place-based Economic Development

Equity

- The promise of civil society
- Face-to-face Democracy
- Equitable Allocation of Public Goods

Economy

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## BIOREGIONAL GOVERNANCE PRINCIPLES

<table>
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<tr>
<th>Type of ecosystem</th>
<th>Community with ecology</th>
<th>Place-based economy</th>
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<tr>
<td>Coastal</td>
<td>Restore the relationship between people and places</td>
<td>Restore the relationship between place and the mode of production and consumption.</td>
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<td></td>
<td>Promote place-based education and ecological literacy programs</td>
<td>Use resources based on intergenerational values and equity and environmental justice</td>
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<td>Protect rural lands</td>
<td>Develop regional markets for regionally-produced products</td>
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<tr>
<td>Marine</td>
<td>Establish large-scale no-take MPAs to protect marine ecosystems</td>
<td>Develop regional fishery trusts and co-operatives promoting regional markets for local fisheries</td>
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<td></td>
<td>Protect keystone species, such as birds and mammals</td>
<td>Create value-added programs for products harvested sustainably</td>
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<td>Promote ecological literacy programs</td>
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- Restore the relationship between place and the economic production and consumption model
- Establish biodiversity policies which also support intergenerational equity values and environmental justice;
- Develop regional markets for regionally-produced marine products;
- Create value-added programs for sustainably produced marine resources;
- Develop regional fishery trusts and co-operatives promoting regional markets for local fisheries;
- Assess and monitor economic strategies based on their ability to detect long-term trends in changes to economic security, and the causes of significant marine ecosystem change;
- Assess and monitor economic strategies that shed light on how coastal marine ecosystems sustain vibrant, equitable, and economically diverse human activities; and
- Emphasize co-operative, inter-jurisdictional, cross-boundary conservation partnerships that can cultivate the necessary place-based, social and economic alliances, potentially with new roles for government and non-government groups.

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### REFERENCES


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