The role of marine protected areas in sustaining fisheries

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After World War II there was much optimism that fisheries could feed the World.

But at the beginning of the 21st century, we are not so sure.
Quota management of fisheries in the European Union has failed to deliver sustainability.
Cod decline in the Kattegat, North Sea
Extinction is the ultimate in unsustainable fishing, whether or not the species of concern are targets of the fishery.
What is missing from fishery management?

• Real provision for habitat protection and recovery
• Precautionary targets
• Resolute enforcement
Objectives of marine reserves

- Sustaining fisheries
- Conservation
- Maintaining ecosystem processes and services
Discover Nature’s Best Hunting and Fishing:
The National Wildlife Refuge System

Hunting and fishing are American traditions that date back long before the Revolutionary War. Today, hunting and fishing are enjoyed by millions of Americans who cherish this traditional connection with wildlife, as did their ancestors. In addition, hunting and fishing serve as an important wildlife management tool in many locations.

Bowhunter arrowed a potential world-record whitetailed deer on this wildlife refuge.

Kamuti National Wildlife Refuge encompasses 1.4 million acres in north-central Alaska. Moose are the most popular quarry here, but hunters also come in search of black and brown bear, and caribou. Visitors braving the harsh winter are often
The fishery effects of marine reserves and fishery closures

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www.worldwildlife.org/oceans/pdfs/fishery_effects.pdf
What is the evidence that reserves work?

Reserves all over the world show dramatic increases in spawning stocks Usually by at least 2-3 times in 5-10 years
Long-term studies in New Zealand, Philippines, Florida and many other countries show strong responses to reserve protection.
Fish in reserves do live longer, grow larger and produce more eggs.
Egg production from protected fish stocks increases by much more than stock biomass.
Catches do increase

Soufrière Marine Management Area, St. Lucia: Established 1995
35% of reef area closed to fishing
Fishers now fish for less time and catch more than before reserves were set up.
Fishers begin to fish close to reserves indicating spillover is occurring

Photo: Tim McClanahan, Mombasa Marine Reserve
Conclusions of our study:

• Marine reserves promote rapid and sustained recovery of exploited stocks
• They promote habitat recovery and increase biodiversity
• Effective marine reserves can be designed for any habitat that is exploited
• They work well across the spectrum from artisanal to industrial fisheries
• The key is to establish areas of the appropriate scale and enforce them well
The best demonstrations of fishery benefits to date have been from places where 10 to 40% of the sea have been protected.

Theoretical work indicates we should protect between 20 and 40% of the sea to maximise fishery benefits.
Using marine reserves to rebuild sources of fish reproduction

Business as usual outside reserves;

Inside reserves, egg production increases ten-fold
To achieve the level of protection required we must fully integrate conservation and fisheries management.

Fisheries are a conservation problem, and conservation is a necessity for sustainable fisheries.
This is what a marine reserve network covering 30% of the North Sea might look like
33.4% of the Great Barrier Reef Marine Park was protected from all fishing in 2004.
Marine reserves rebuild resilience in marine ecosystems

Unexploited population

Exploited population protected by no-take reserves

Exploited population with no reserves – crashes!

MPAs for mobile species and on the high seas

- Protect nursery areas with high juvenile by-catch
- Protect migration routes and bottlenecks
- Protect spawning aggregation sites
Circles show location of bluefin tuna schools in August 1996.

Mobile reserves (time-area closures) are possible.
Scallop fishing effort distribution (data from NMFS)

Satellite technology permits enforcement of offshore reserves – real time vessel monitoring
The deep sea cannot feed humanity if we mismanage shallow seas. Deep sea habitats are fragile and easily destroyed by fishing. Deep sea fish have low production and quickly disappear.
There is a strong international mandate for marine protected areas

- World Summit on Sustainable Development: Nations agreed to establish national networks of marine protected areas by 2012
- World Parks Congress, 2003: Recommended at least 20-30% of the sea should be protected from all fishing
- Running cost of this network estimated as $12-14 billion per year; less than the $15-$30 billion spent on subsidies that support excess fishing

A few comparisons:

$14 billion

$15 billion

$31 billion (USA and Europe)

$18 billion
Marine reserves supply key missing ingredients for fishery management

- They protect habitats and facilitate recovery
- They can prevent extinctions
- They promote resilience
- They add precaution
- But they also need resolute enforcement
World Summit: Nations also committed to rebuilding fish stocks to maximum sustainable yield levels by 2015

In my view, we cannot achieve this without a large-scale, international network of marine protected areas, including the high seas.
Now is a time of great opportunity:

We have a strong mandate to create MPA networks

We have good science to inform protected area selection

We have a near empty canvas on which to implement real and lasting protection

There has never been a more timely moment to act!