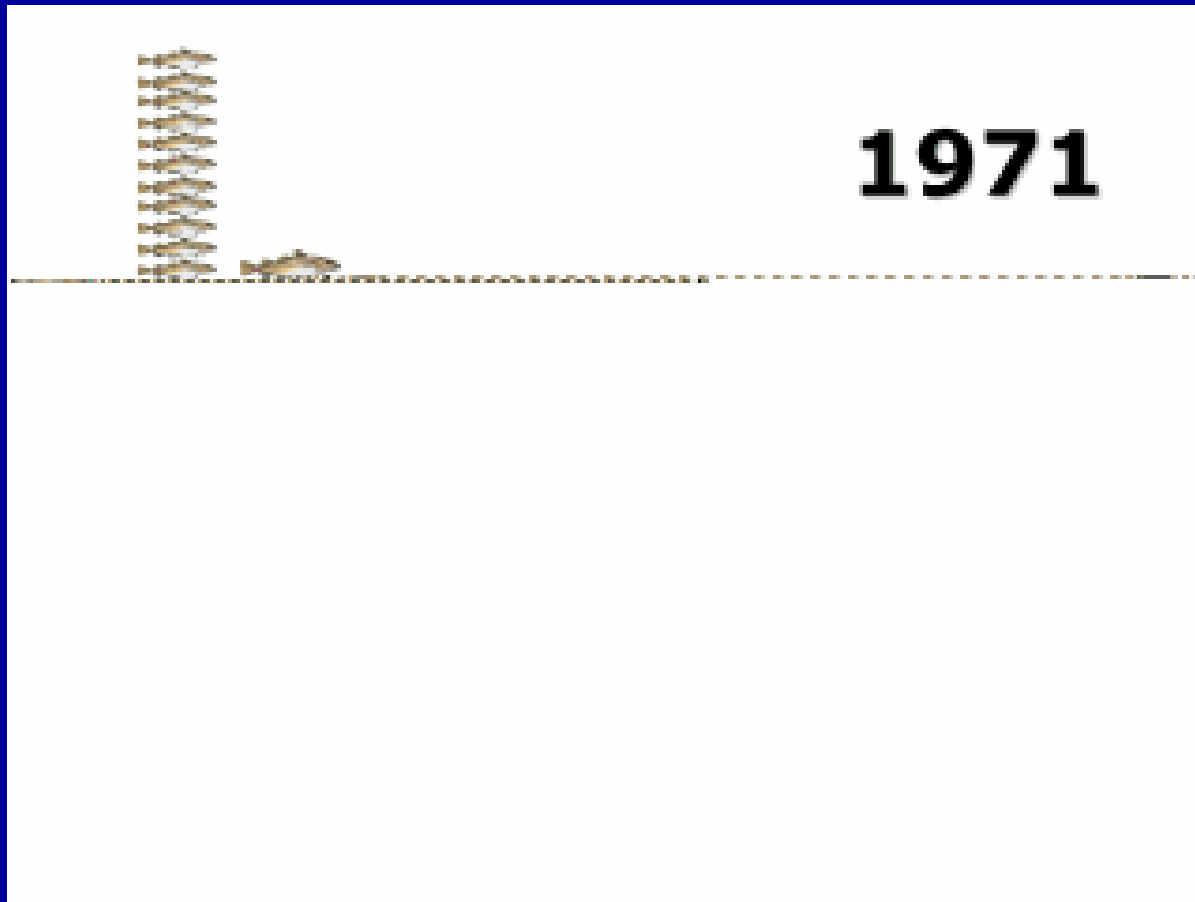


www.ck12.org

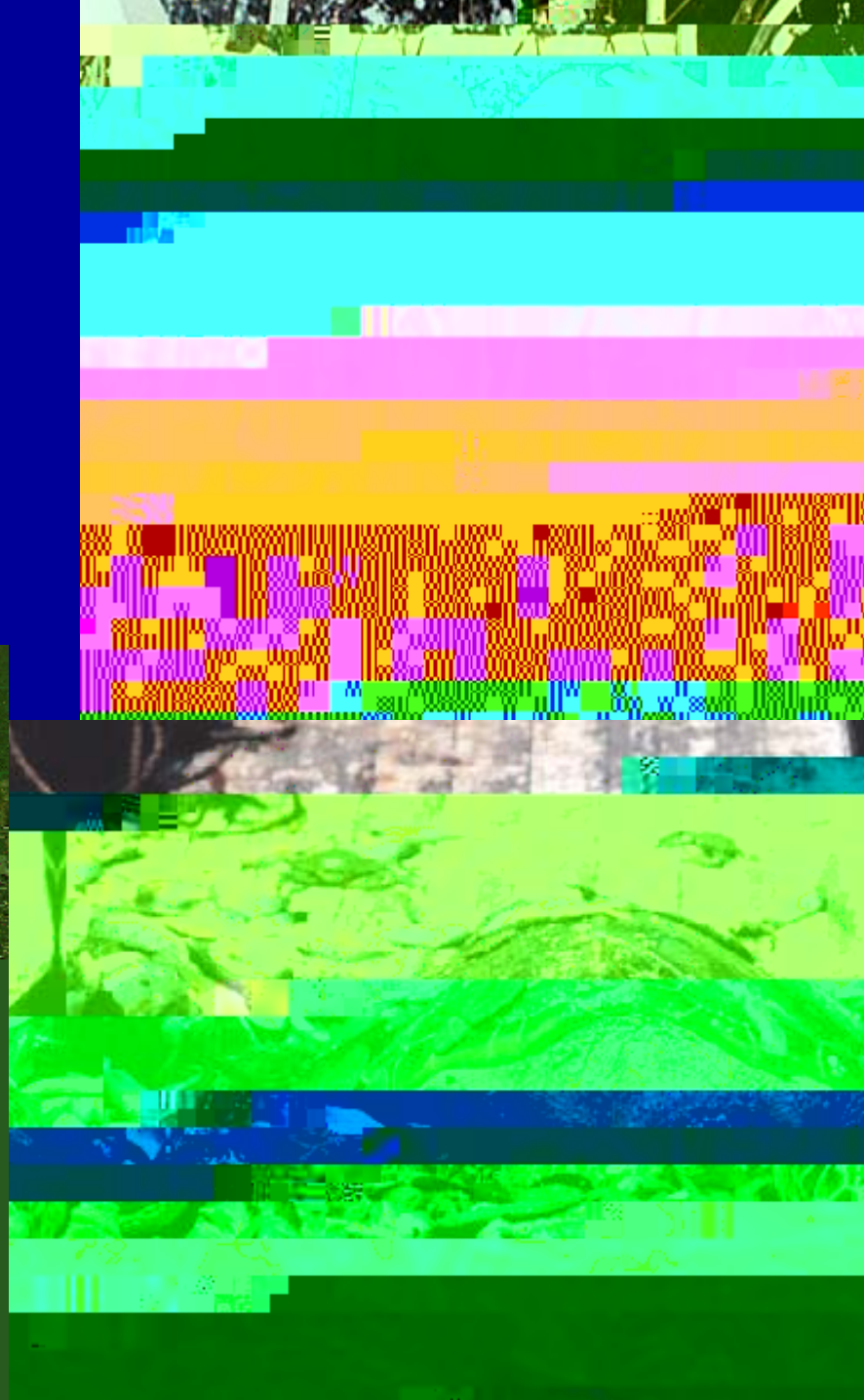
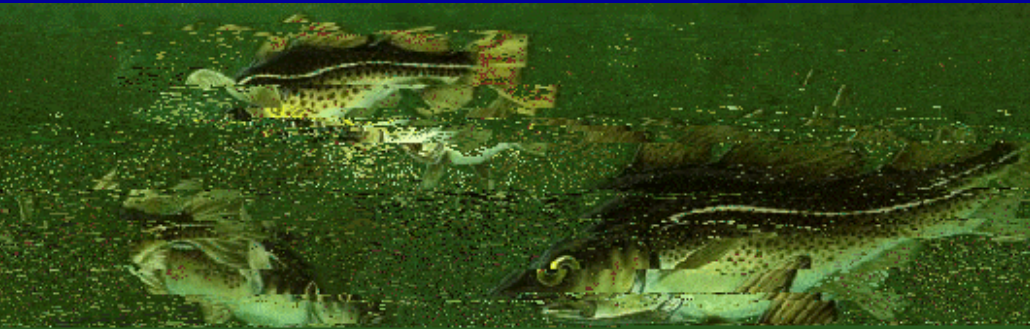
Quota management of fisheries in the European Union has failed to deliver sustainability

Year



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



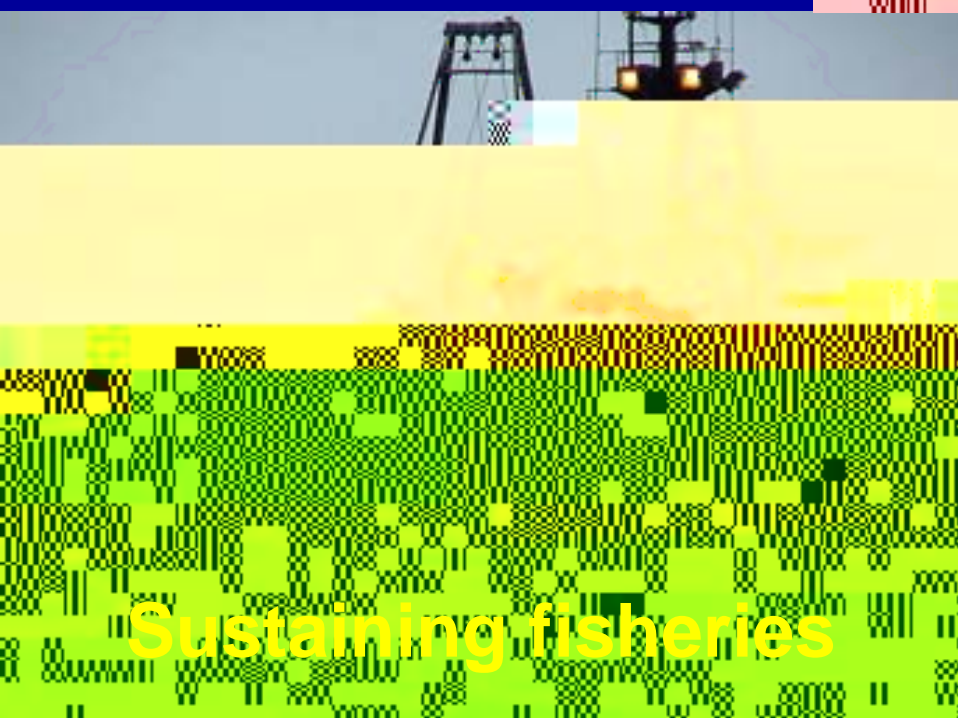
What is missing from fishery management?

- Real provision for habitat protection and recovery
- Precautionary targets
- Resolute enforcement

Objectives of marine reserves



Maintaining ecosystem processes and services



Sustaining fisheries



Conservation

U.S. Fish & Wildlife Service

U.S. Fish & Wildlife Service

Ever Point's Best

DISCU

Hunting and Fishing:

The National Wildlife Refuge System

rest over

Wildlife

Hunting and fishing are American traditions that date back long. Low hunter harvest and potential world-record whitetailed deer on

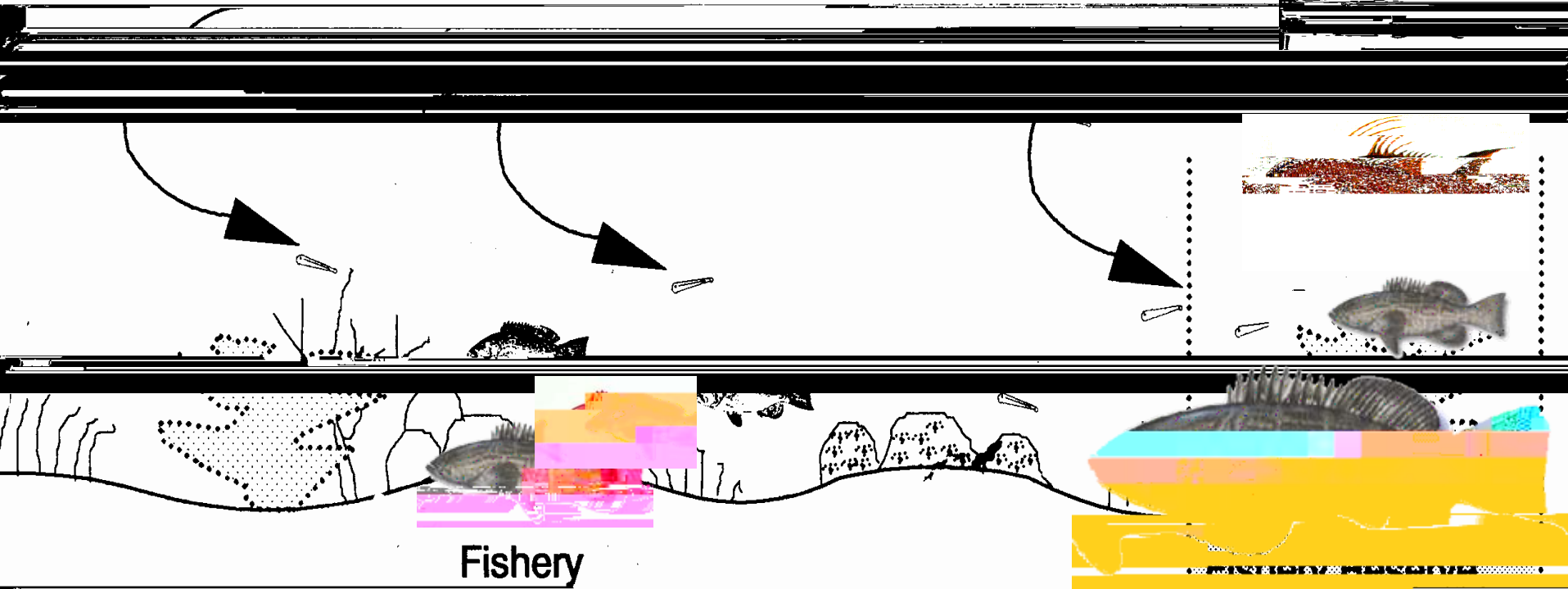
The National V



www.worldwildlife.org/oceans/pdfs/fishery_effects.pdf

Larval Dispersal


Reproduction



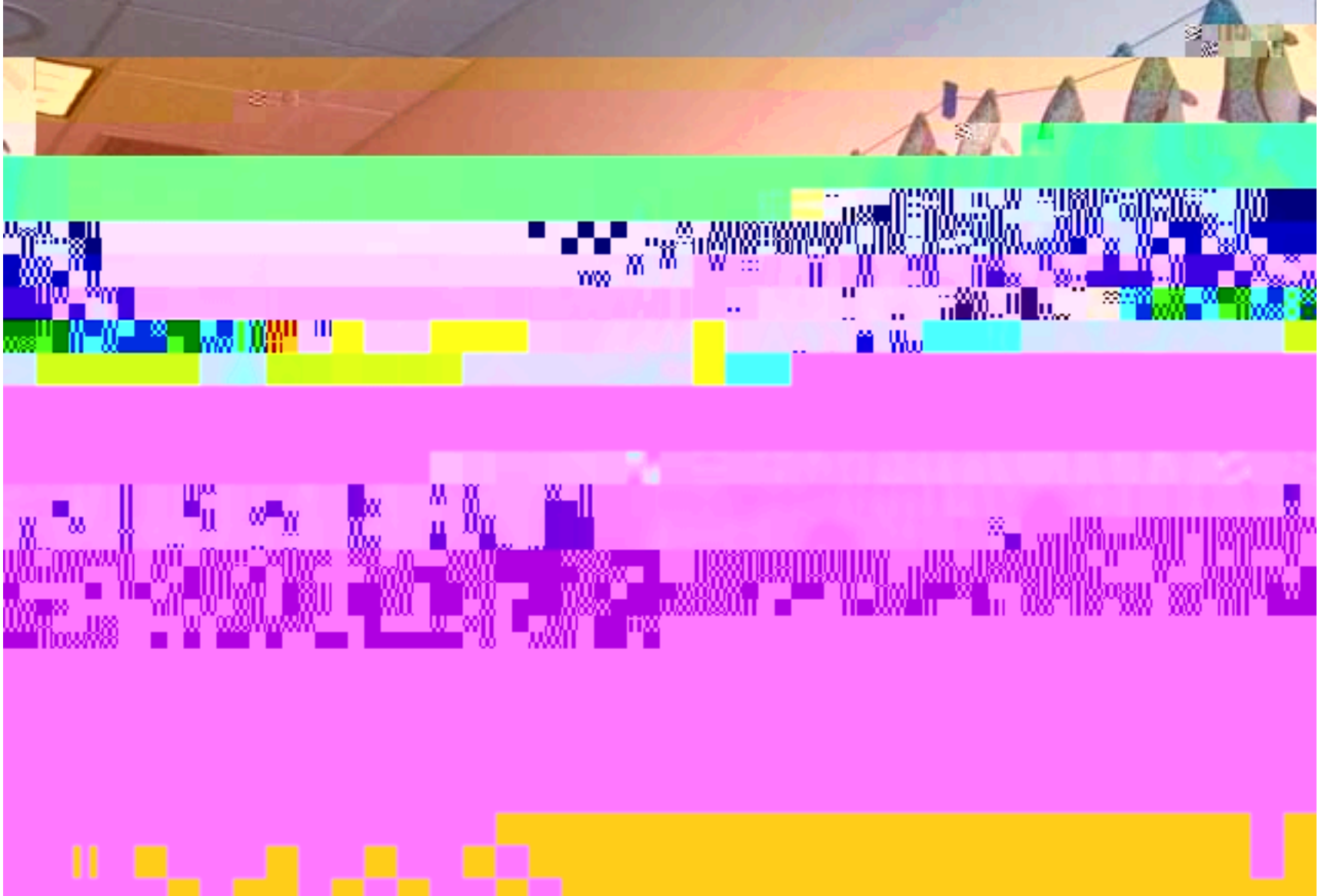
What is the evidence that reserves work?

Reserves all over the world show dramatic increases in spawning stocks

Usually by at least 2-3 times in 5-10 years



Fish in reserves do live longer,
grow larger and produce more
eggs



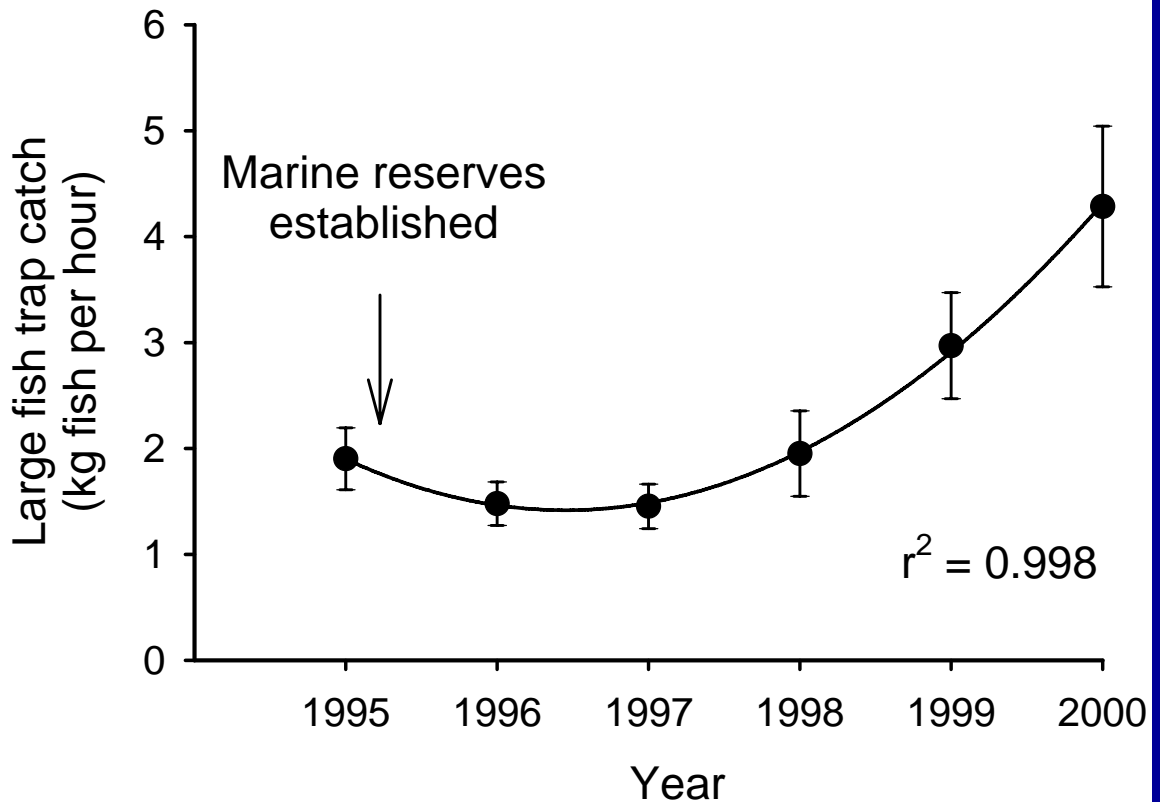
Egg production from protected fish stocks increases by much more than stock biomass

**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



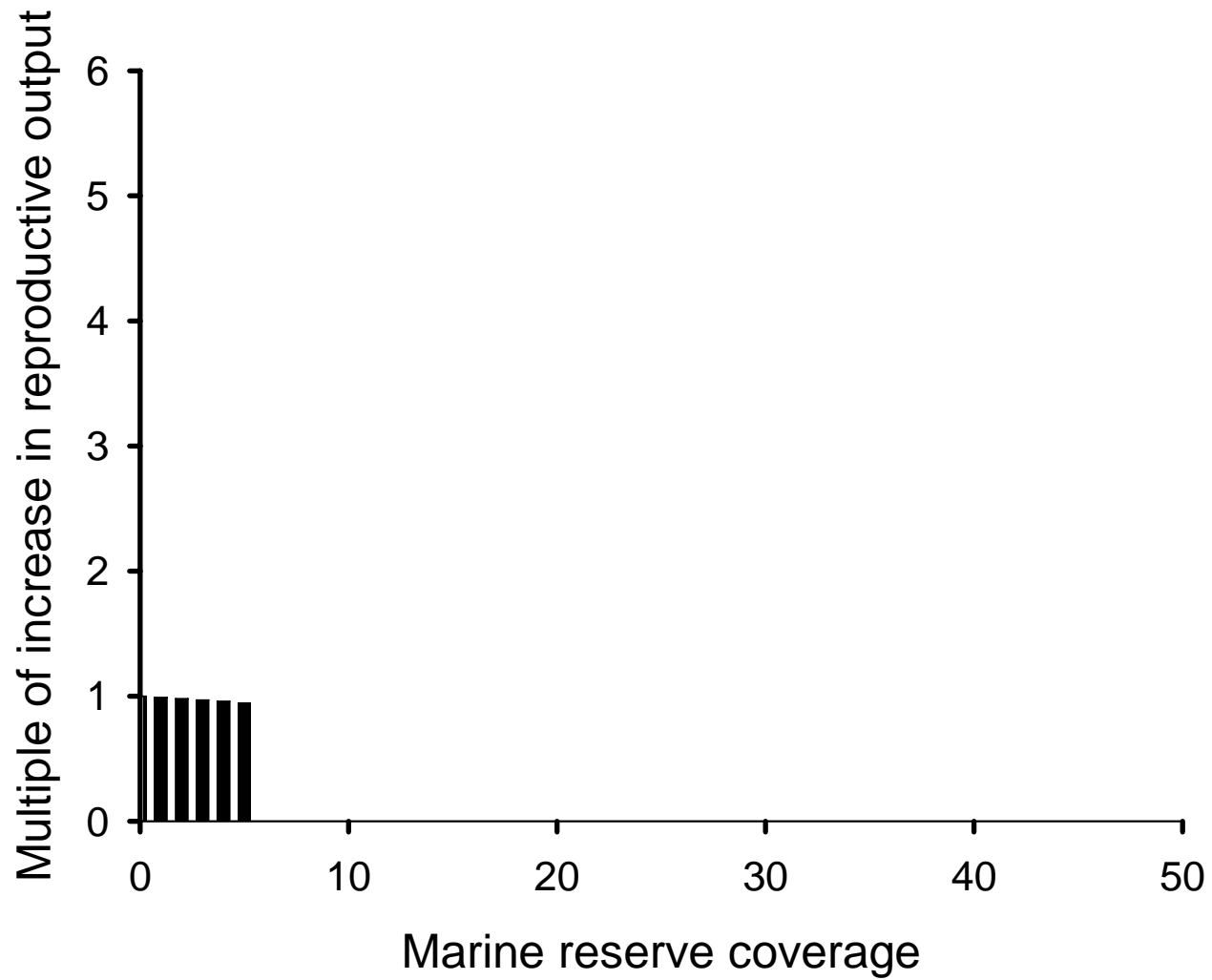
An underwater photograph showing a large, dark-colored fish, possibly a grouper, swimming in the water. A diver is visible in the background, partially obscured by the fish. The water is clear and blue. The text is overlaid on the top right of the image.

Fishers begin to fish close to reserves indicating spillover is occurring

Photo: Tim McClanahan, Mombasa Marine Reserve

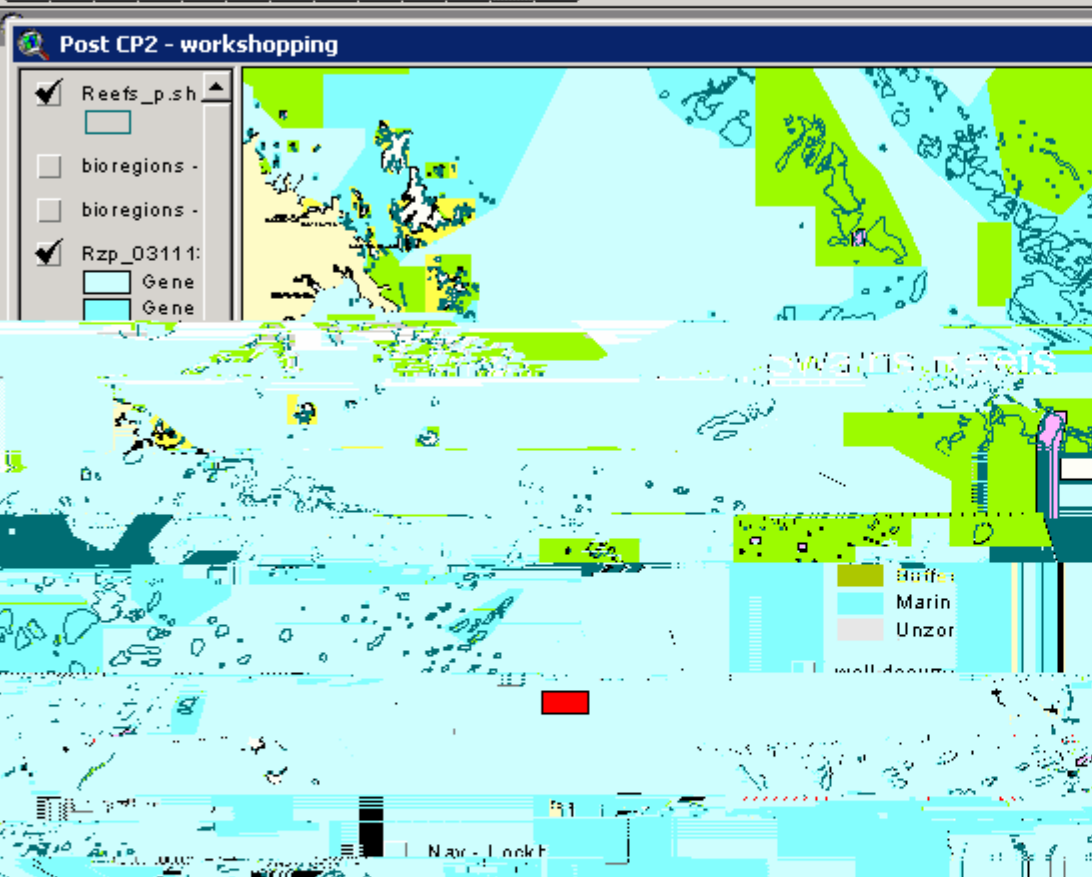
Conclusions of our study:

- **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**



To achieve the level of protection required we must fully integrate conservation and fisheries management

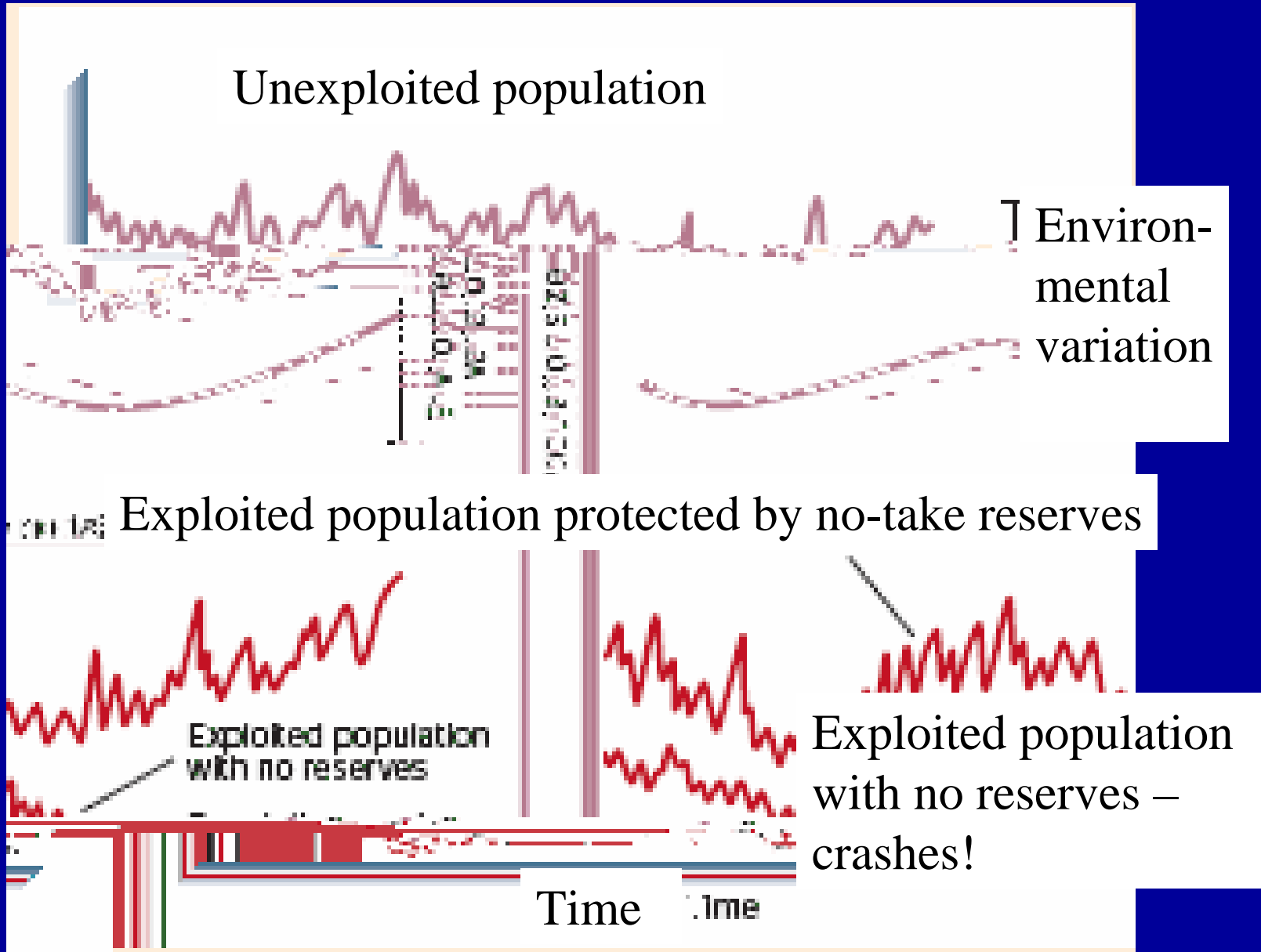
Fisheries are a conservation problem, and conservation is a necessity for sustainable fisheries



33.4% of the Great Barrier Reef Marine Park was protected from all fishing in 2004

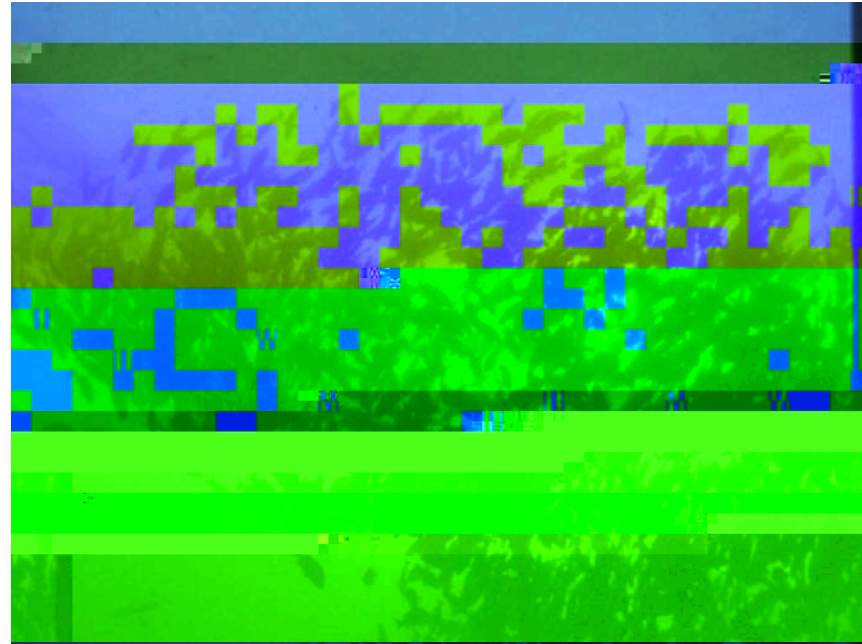
Mecklen

Marine reserves rebuild resilience in marine ecosystems



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

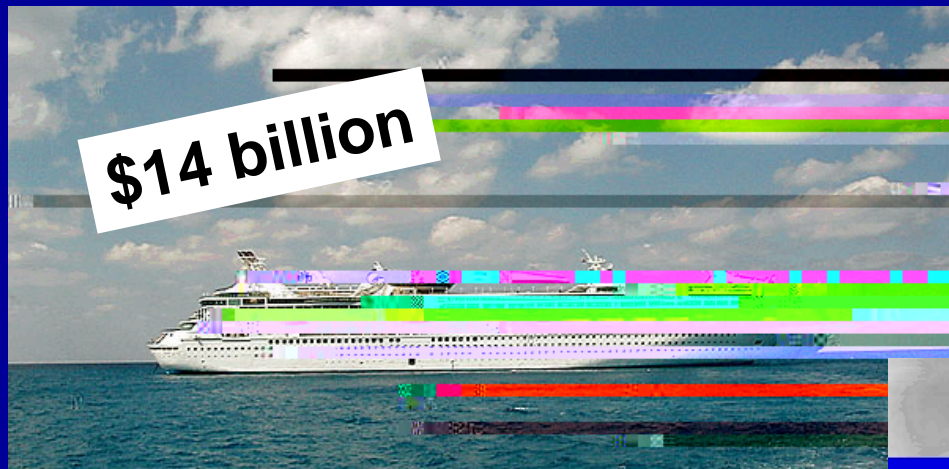
Mobile reserves (time-area closures) are possible

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

Balmford, Gravestock et al. (2004) PNAS 101: 9694-97

A few comparisons:



\$14 billion



\$31 billion (U)

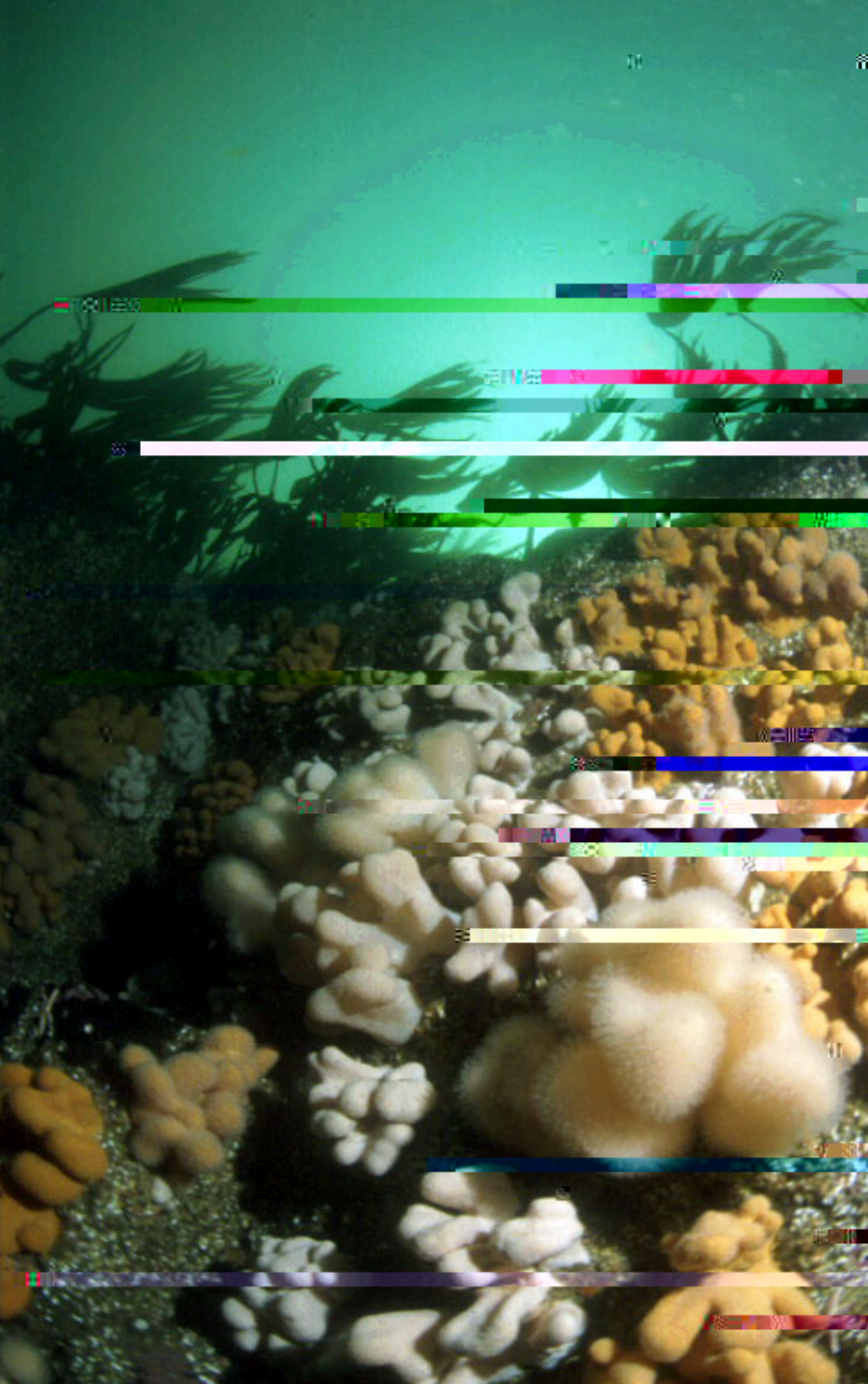


Marine reserves supply key missing ingredients for fishery management

- 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