Why a Global Interest in MPA *Networks*?

- What is a network?
- Why consider networks?
- What should networks look like?
- How will we evaluate them?

MPA news

International News and Analysis on Marine Protected Areas

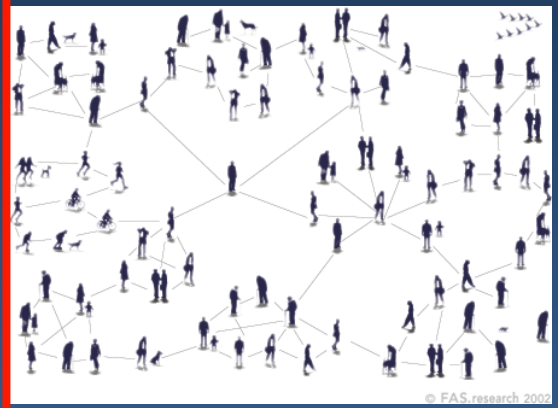
World Summit Calls for MPA Networks by 2012

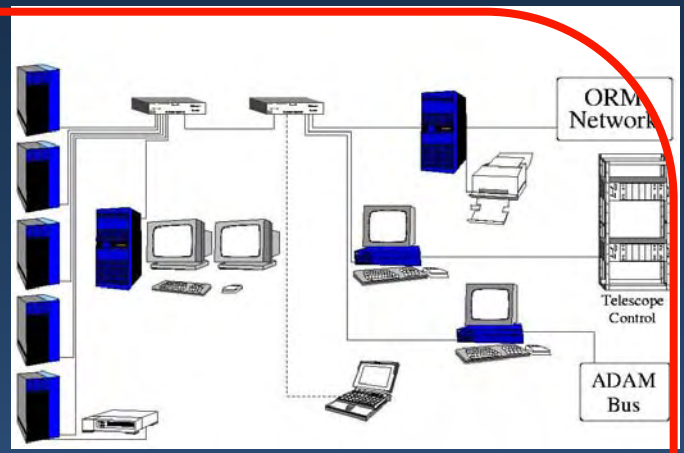
Representative networks of marine protected areas should be established worldwide by the year 2012, and depleted fish stocks restored by 2015, according to an action plan agreed upon by global leaders at the World Summit on Sustainable Development (WSSD), held earlier this month in Johannesburg, South Africa. The

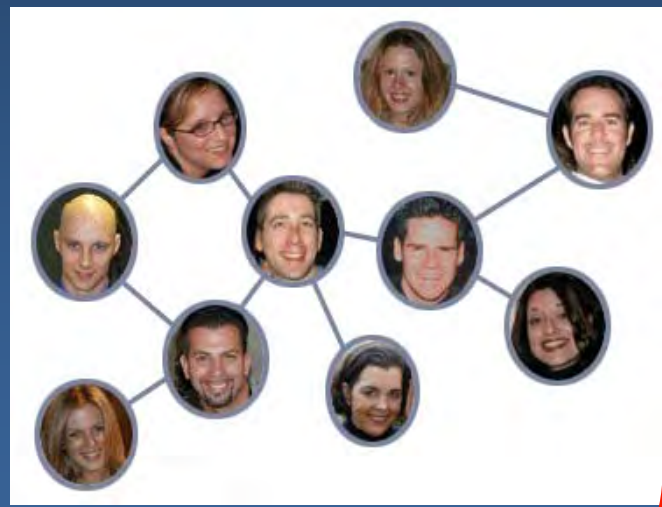
Reaction to the fisheries accord

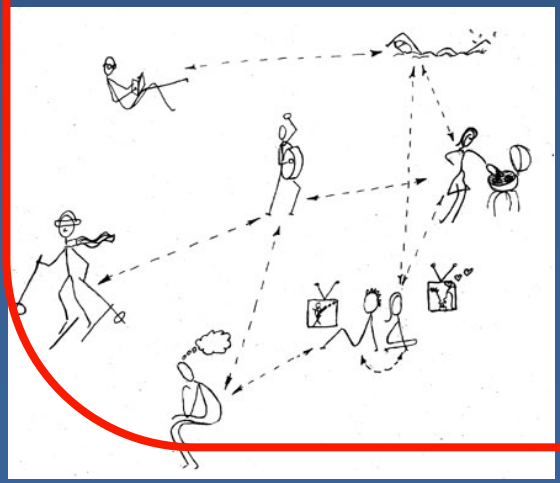
Graeme Kelleher, former chairman of the Great Barrier Reef Marine Park Authority and co-editor of the multi-volume work *A Global Representative System of Marine Protected Areas* (1995), said that critics may regard much of the WSSD fisheries accord as a "wish list". However, he

What is a Network?



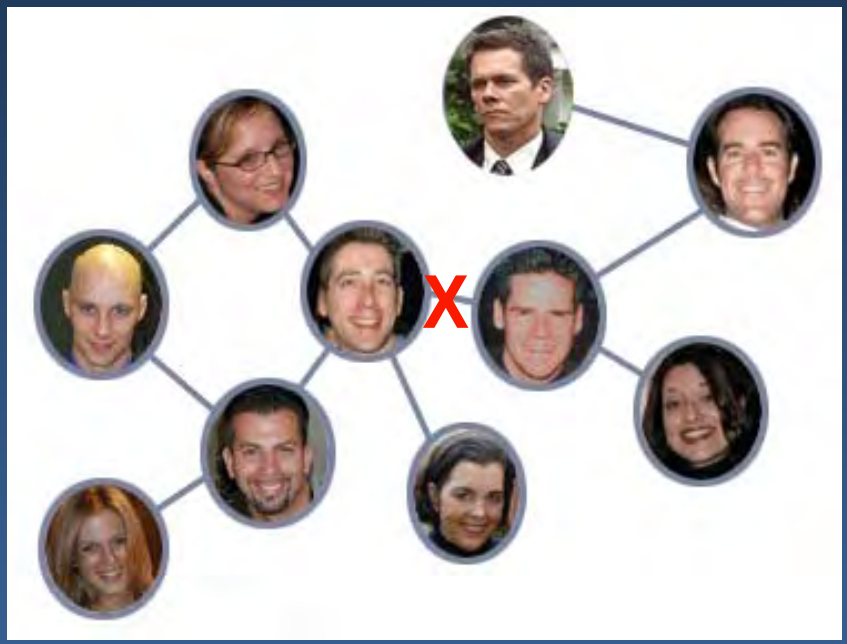




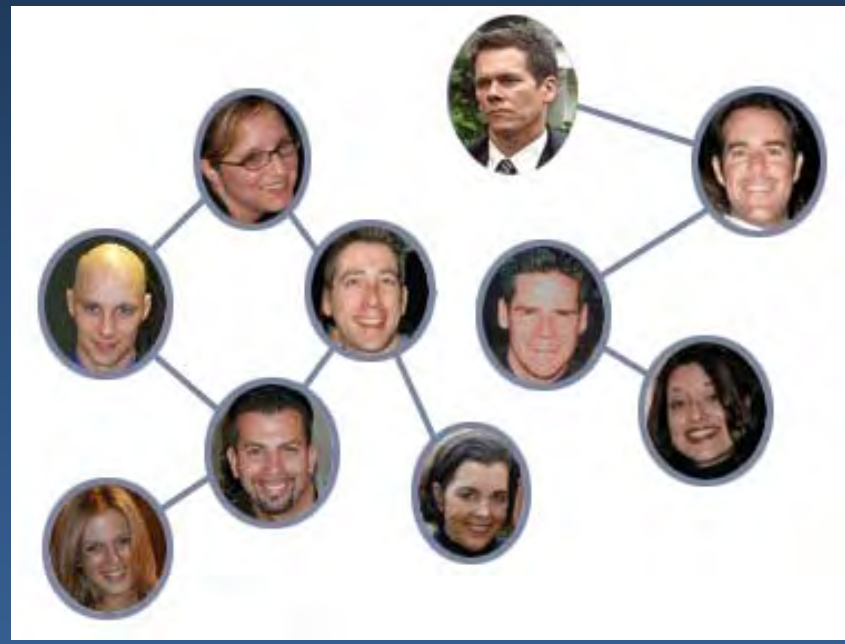


CARTOON NETWORK

Networks Rely on Connections



Network

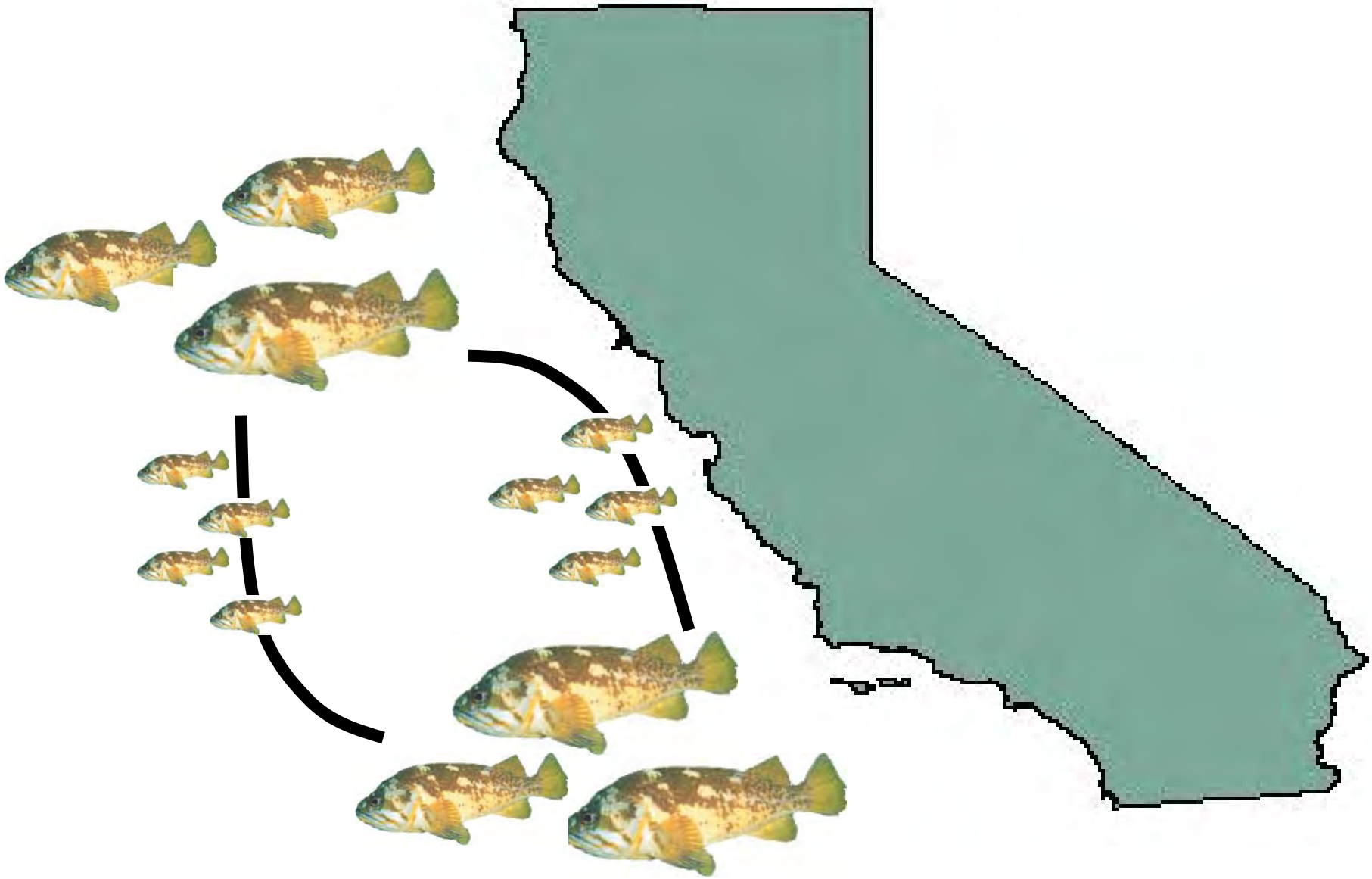


Broken Network

Ecological Networks in the Ocean

- Simpler problem
  - Connections more linear
  - Connections through movement

Connections through Movement Of Adults and Young



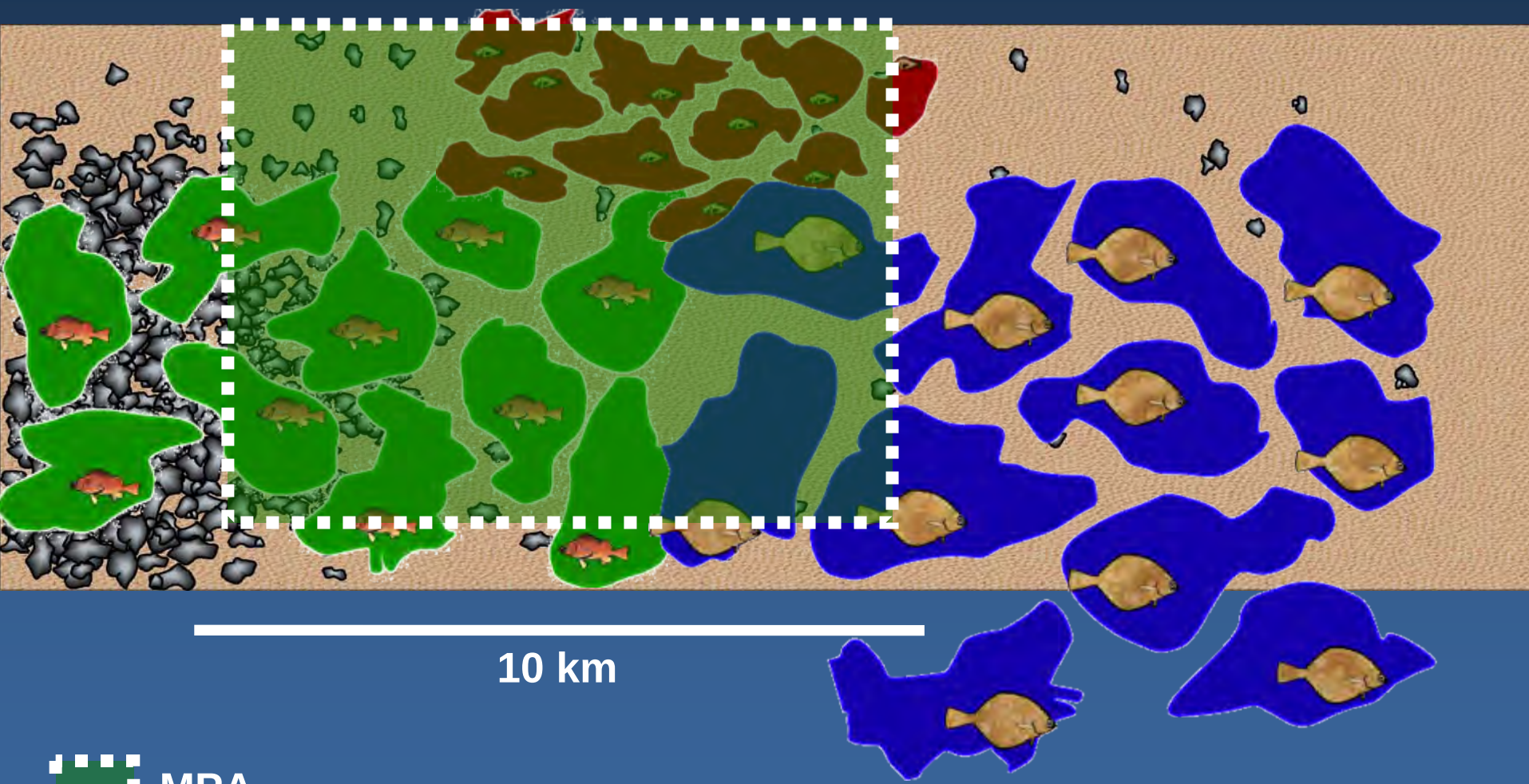
Why consider *Networks*?

- **Could we achieve the major conservation goals of the MLPA with a single marine reserve?**

Yes

(but some may not like the answer)

To achieve sustainable populations: MPA size > movement



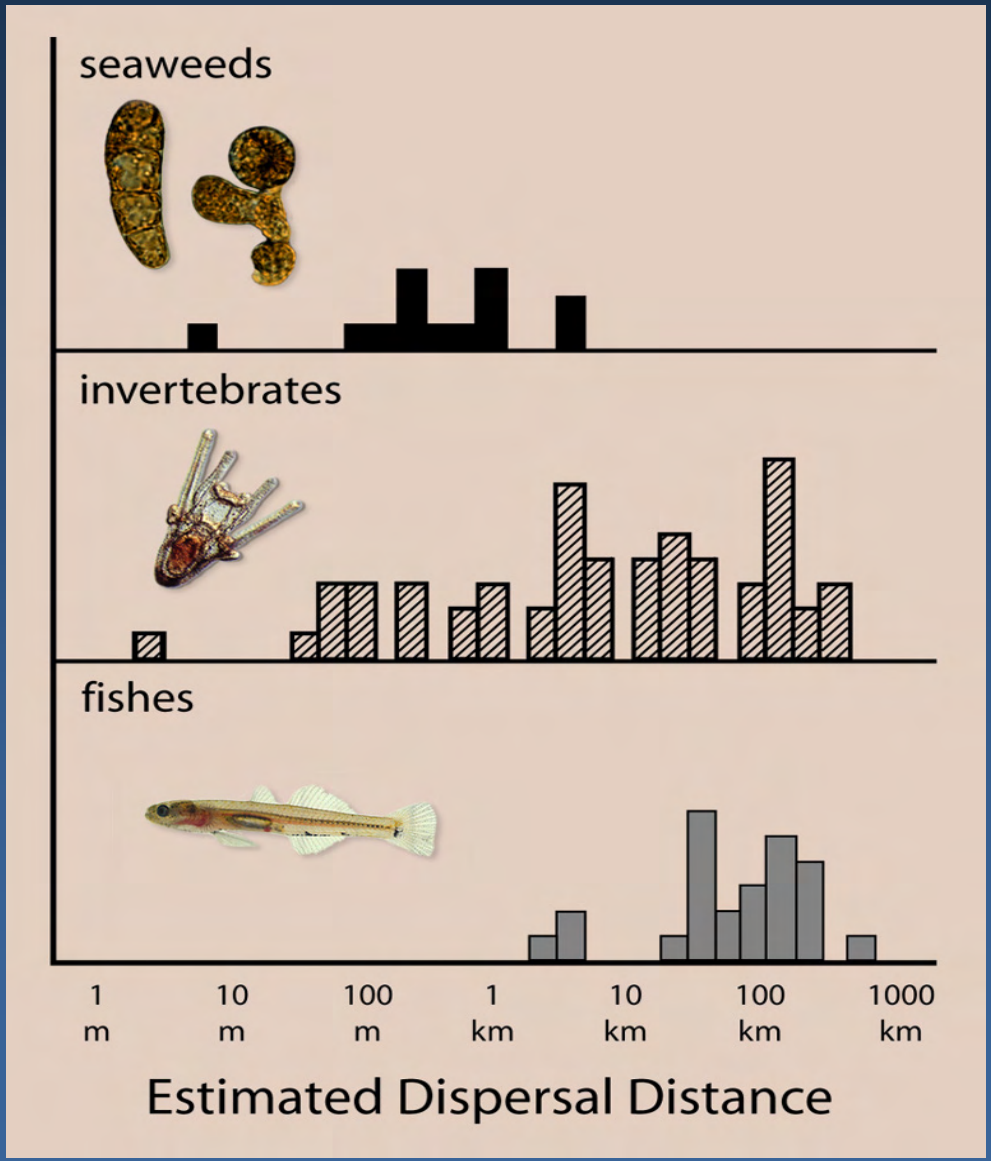
Botsford, Hastings and Gaines 2001

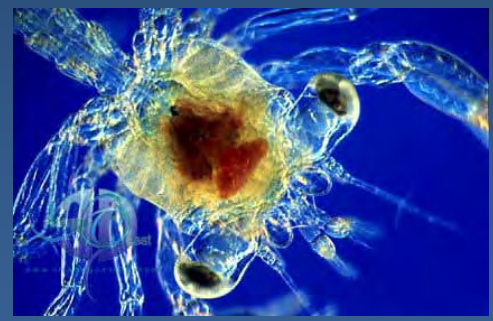
Adult Movement for Species of Interest

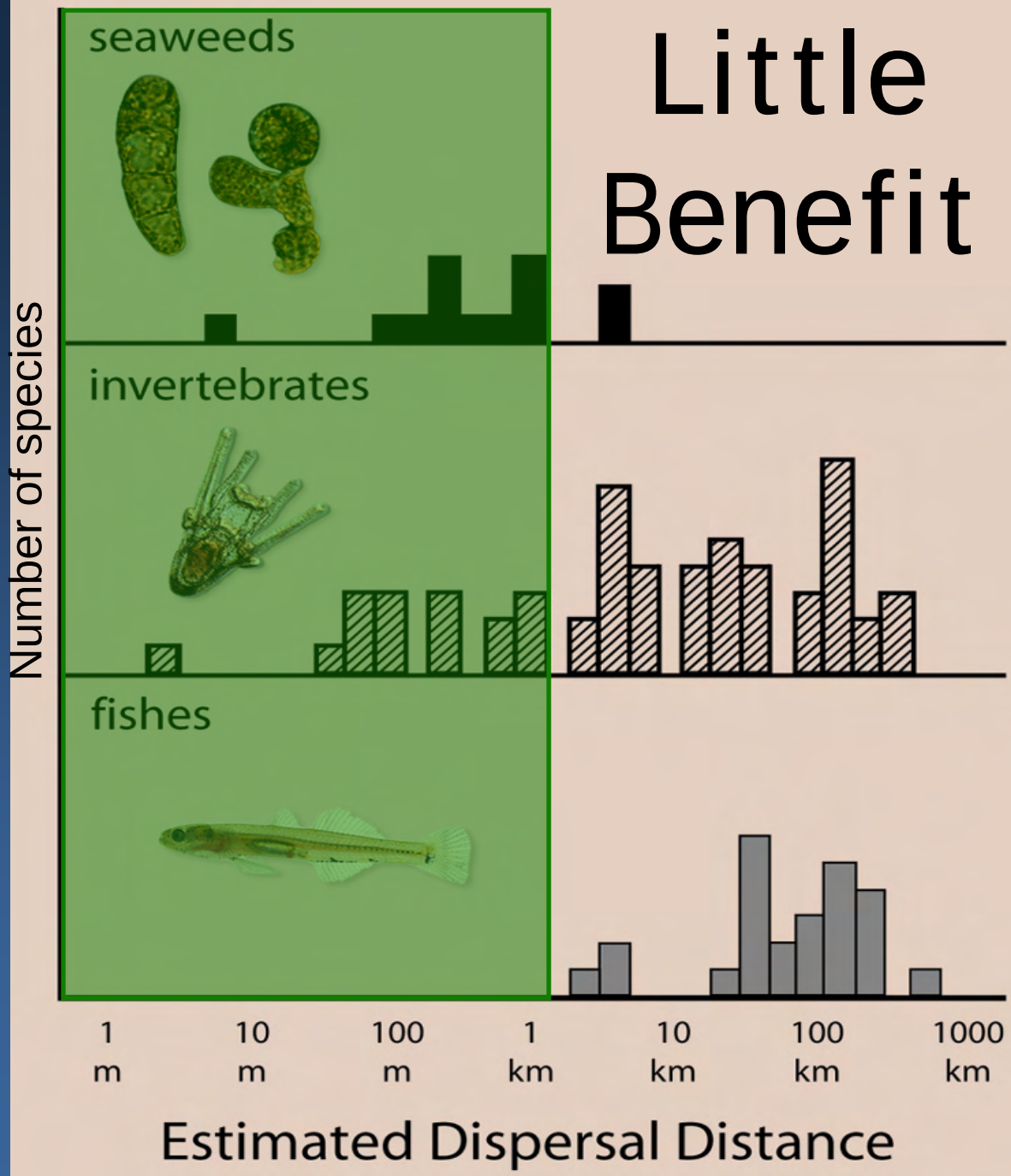
0 – 1 km	1 – 10 km	10 – 100 km	100 – 1000 km	> 1000 km
Invertebrates Abalone Mussel Octopus Sea Star Snail Urchin Rockfishes Blk. & Yellow China Gopher Kelp Other Fishes Gobie Sculpin	Rockfishes Black Brown Copper Greenspotted Olive Vermilion Other Fishes Cabezon Ca. Halibut Lingcod	Invertebrates Dung. Crab* Rockfishes Bocaccio Canary Yellowtail Widow Other Fishes Anchovy Herring Sardine Birds Gulls Cormorants Mammals Harbor Seal Otter	Fishes Big Skate Pacific Halibut Sablefish* Salmonids* Sturgeon Whiting* Birds Gulls* Mammals Porpoises Sea Lions*	Invertebrates Jumbo Squid* Fishes Sharks* Tunas* Turtles* Birds Albatross* Pelican* Shearwater* Shorebirds* Terns* Mammals Dolphins Sea Lions* Whales*

* Seasonal Migration

Same Rules for Dispersal of Young
MPA size > movement

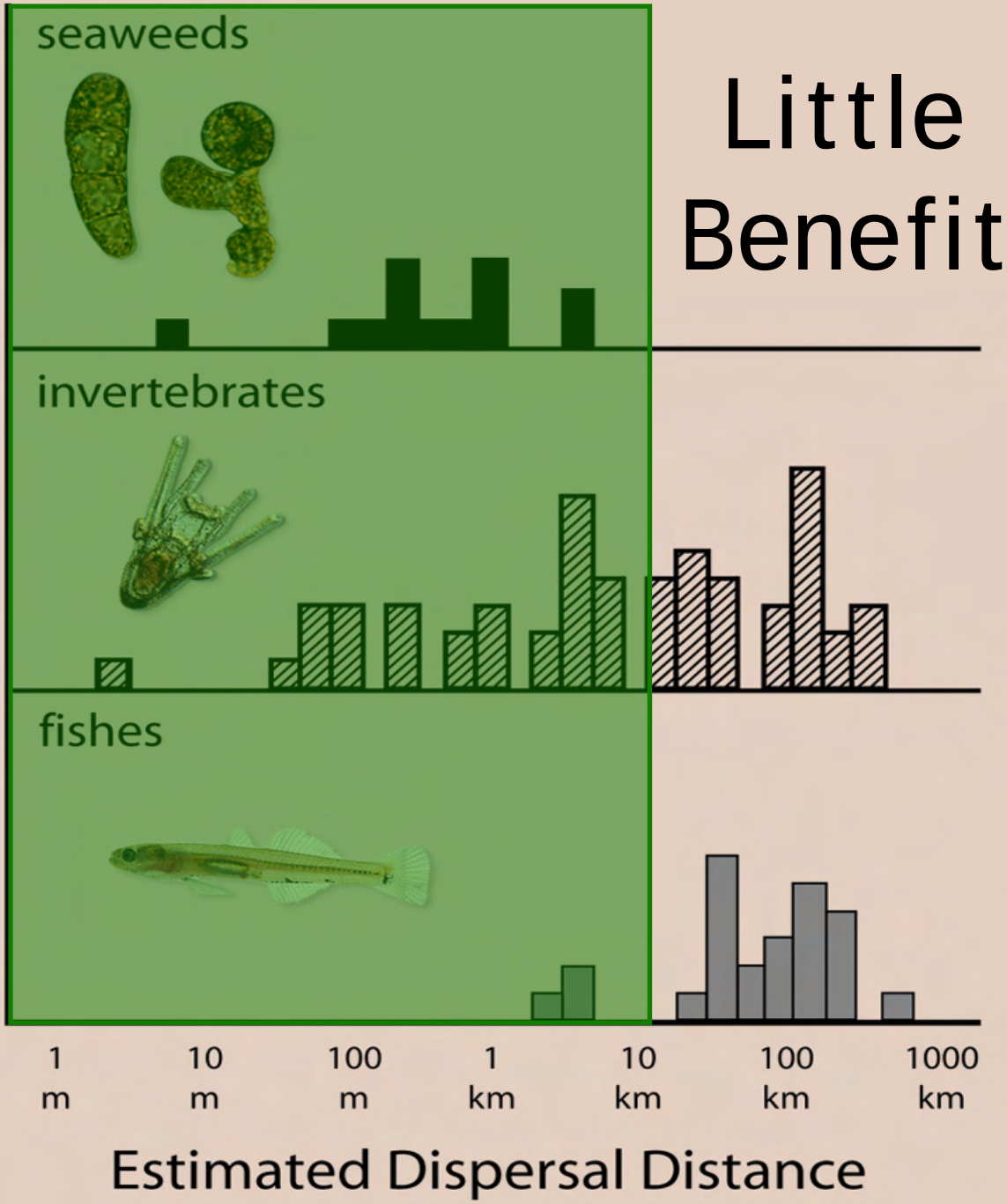






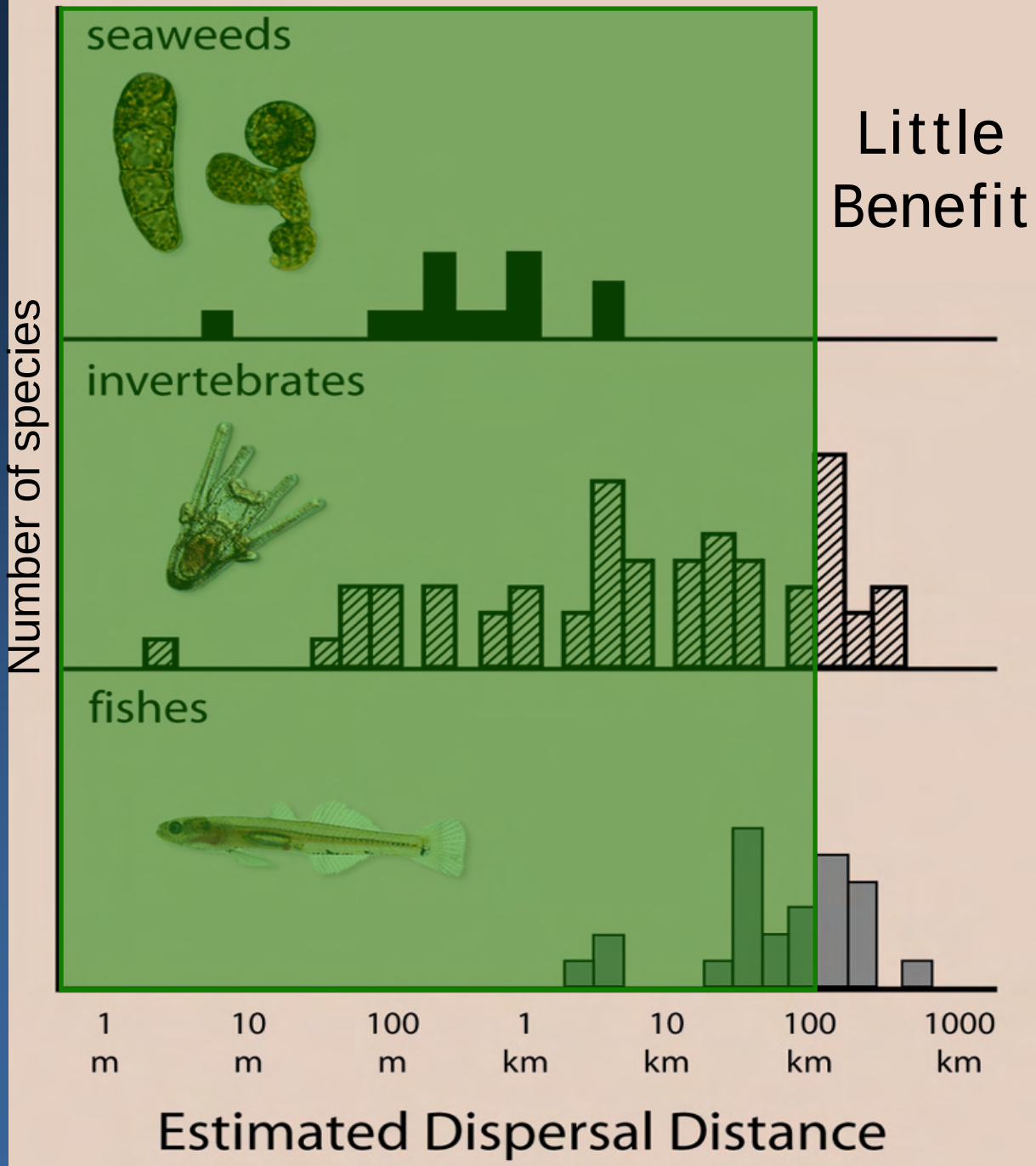
Little Benefit

1 km Reserve

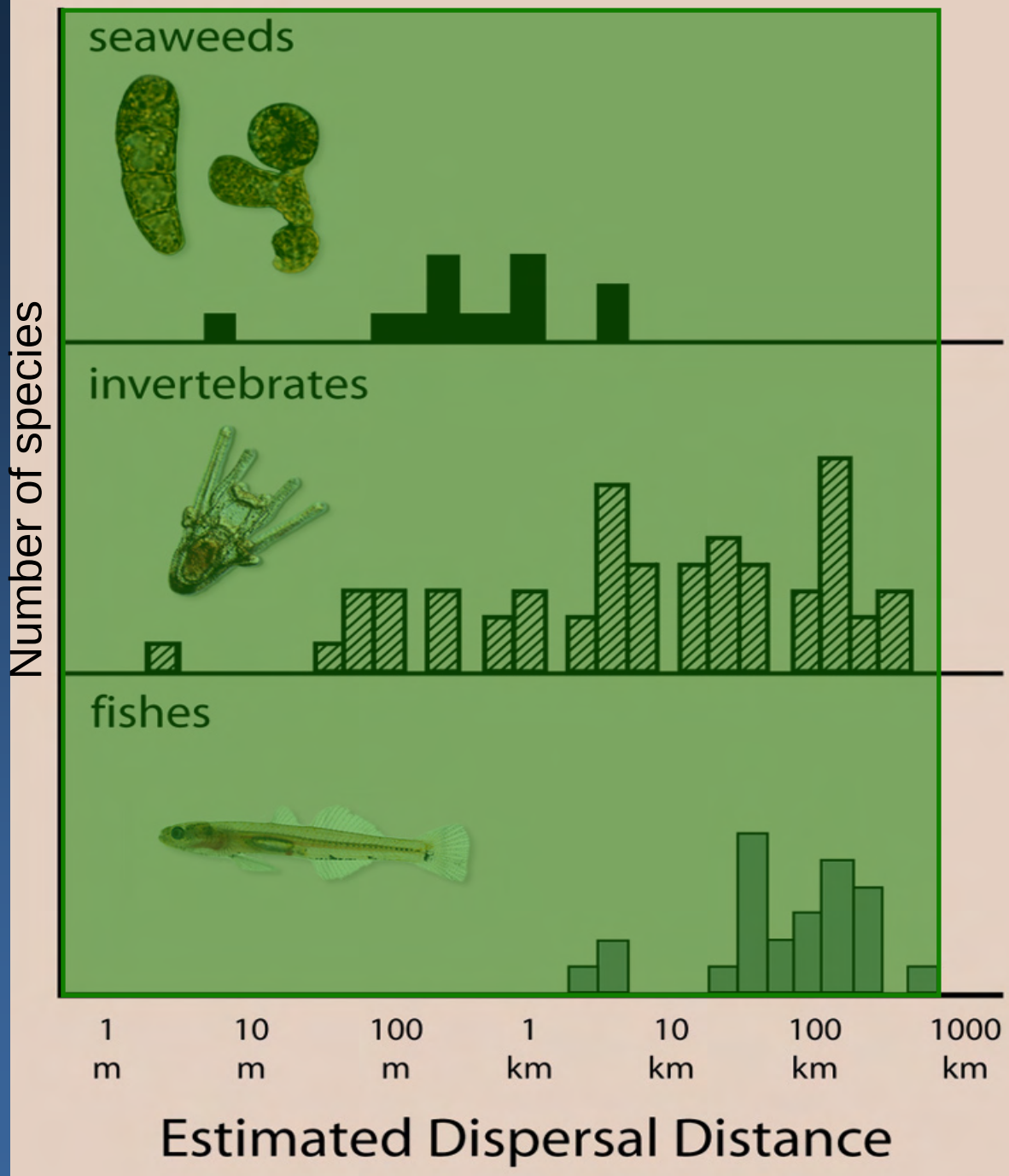


Little Benefit

10 km Reserve



100 km Reserve



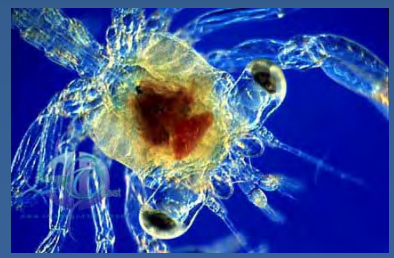
Why Not 1 Very Large Reserve?

Probably Not the Best Option

- Too big
- Not big enough
- Loses potential fisheries benefits

MPAs and Conservation

1. One Large MPA is not the best solution
2. Can multiple MPAs solve these movement problems?

No

Yes