Our Incredible Ocean: Now Is The Time To Protect It

https://www.youtube.com/watch?v=o0AOkDpzNBM

Fisheries Management

- Based on maximum sustained yield
  - Maximal harvest while keeping fish available for the future
  - Managers may limit the harvested or restrict gear used
- Despite management, stocks have plummeted
  - It is time to rethink fisheries management
- **Ecosystem-based management**
  - Shift away from species and toward the larger ecosystem
  - Consider the impacts of fishing on habitat and species interactions
  - Set aside areas of oceans free from human interference

We Can Protect Areas In The Ocean

- **Marine Protected Areas (MPAs):** Established along the coastlines of developed countries
  - Still allow fishing or other extractive activities such as:
    - Dredging, trawling, mowed for kelp, crisscrossed with pipes and cables, and swept through with fishing nets
- **Marine Reserves:** Areas where fishing is prohibited ("no-take" areas)
  - Leave ecosystems intact, without human interference
  - Improve fisheries, because young fish will disperse into surrounding areas
- Many commercial, recreation fishers, and businesses do not support reserves

Check In Question #1: Turn & Talk

- All of the following are allowed in marine protected areas EXCEPT _____.

A. The harvesting of kelp

B. The layering of fiber-optic cables

C. The installation of oil pipelines

D. Oil Drilling

E. Fishing


Punta
de la Sal
Playa del Cabrón
Marine
Reserve
199 m.
Montaña de Arinaga
Faro de Arinaga
Punta de Arinaga
Risco Verde
Arinaga
Punta del Zoco Negro

Weighing the Issues: Preservation on Land and at Sea

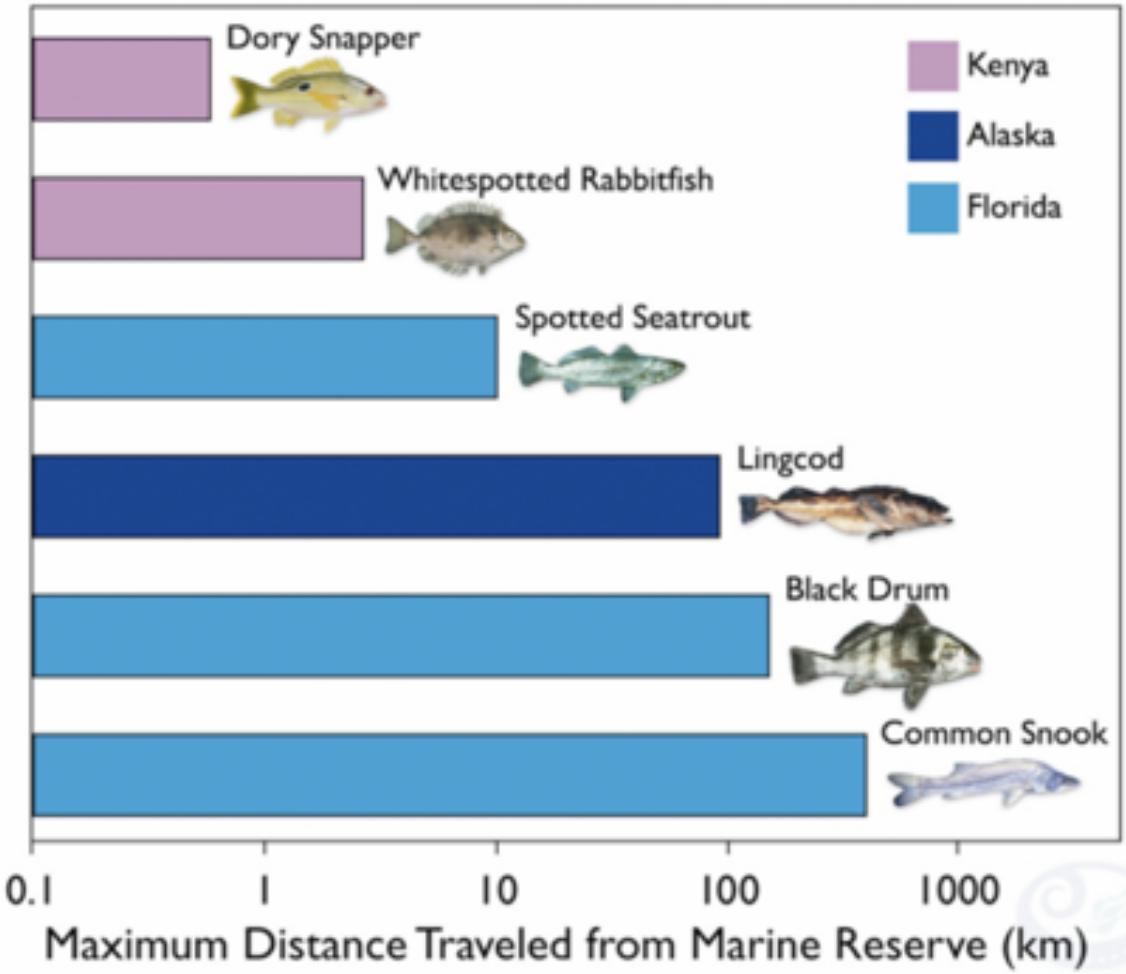
- Almost 4% of U.S. land area is designated as wilderness, yet far less than 1% of coastal waters are protected in reserves.
- Why do you think it is taking so long for the preservation ethic to make the leap to the oceans?

Reserves Work For Both Fish and Fisheries

- Found that reserves do work as win-win solutions
- Overall benefits included:
  - Boosting fish biomass
  - Boosting total catch
  - Increasing fish size
- Benefits inside reserve boundaries included:
  - Rapid and long-term increases in marine organisms
  - Decrease mortality and habitat destruction
  - Lessen the likelihood of extirpation of species

Areas Outside Reserves Also Benefit

- Benefits included:
  - A “spillover effect” when individuals of protected species spread outside reserves
  - Larvae of species protected within reserves “seed the seas” outside reserves
  - Improved fishing and ecotourism



This graph shows the maximum distances that tagged fishes traveled from marine reserves in Kenya (violet), Alaska (navy), and Florida (turquoise). These studies provide direct evidence that fishes spill over from marine reserves into surrounding waters. *Data: Kaunda-Arara & Rose (2004) Environmental Biology of Fishes; Johnson et al (1999) North American Journal of Fisheries Management; Starr et al. (2006) Canadian Journal of Fisheries and Aquatic Sciences*

Check In Question #2: Turn & Talk

- Marine reserves have all of the following benefits except:

A. Fishing increases in the reserve

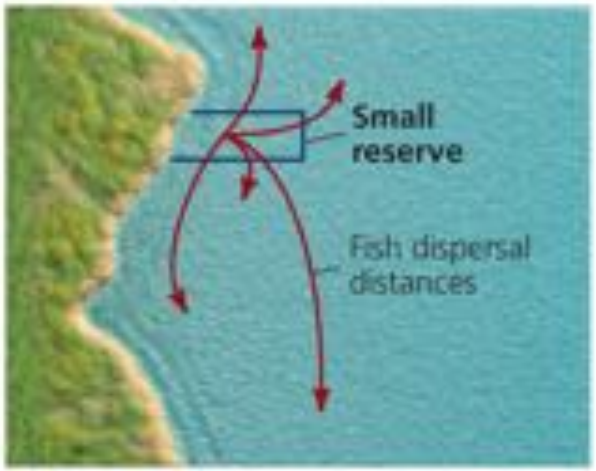
B. The size of fish increases

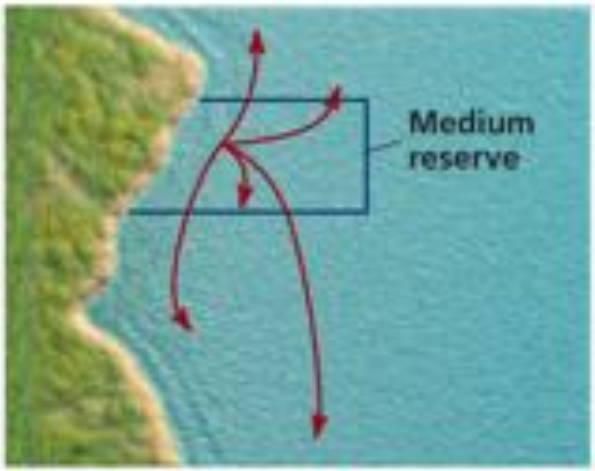
C. Larvae can “seed” areas outside the reserve

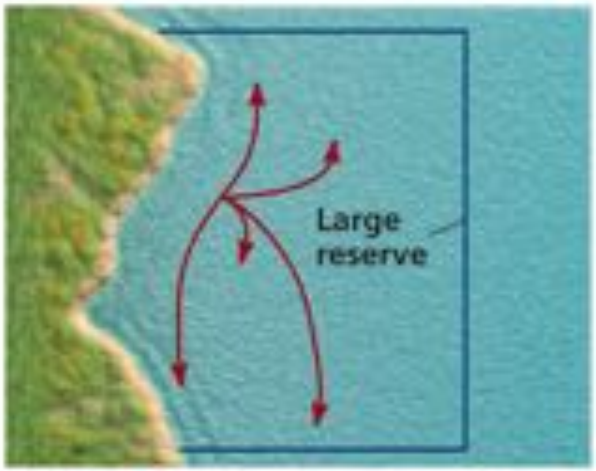
D. Decreased mortality and habitat destruction

How Should Reserves Be Designed

- 20-50% of the ocean should be protected in no-take reserves
  - How large?
  - How many?
  - Where?
- Involving fishers is crucial fisheries in coming with these answers

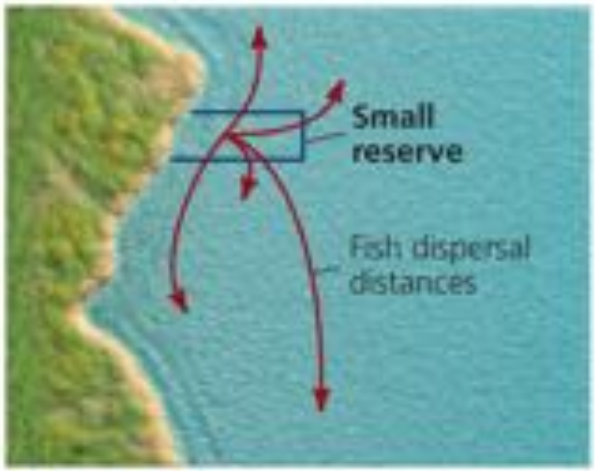


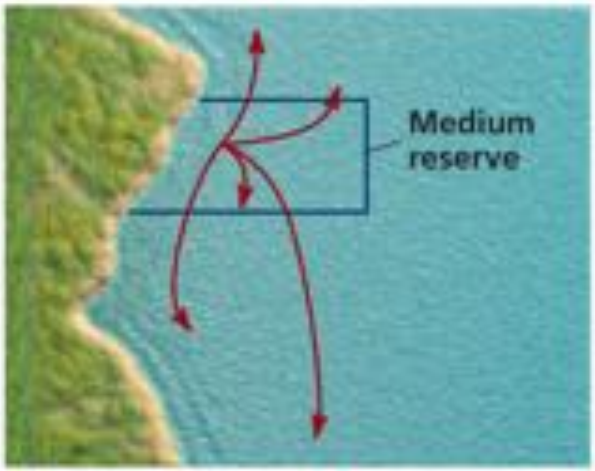


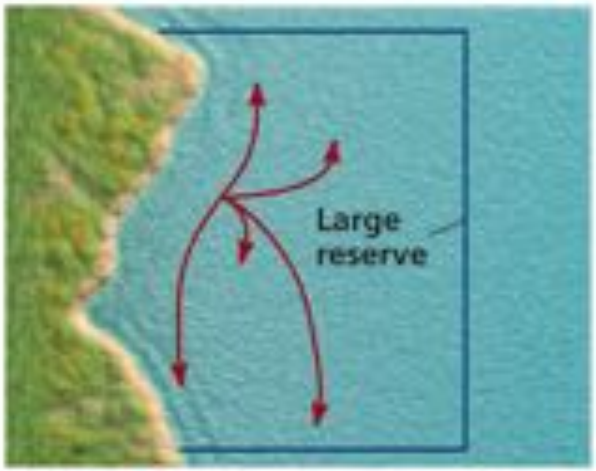


Types of Reserves

- **Small reserves** could fail to protect organisms because too many may leave the reserve
- **Large reserves** may protect more, but would provide less spillover
- **Medium reserves** may provide the best protection while improving local fishing stocks







Conclusion

- Oceans cover most of our planet and contain diverse topography and ecosystems
- We are learning about the oceans and coastal environments, intensifying our use their resources and causing severe impacts
- Setting aside protected areas of the ocean can serve to maintain natural systems and enhance fisheries
- We may once again attain the ecological systems that once flourished in our waters

Essay Question:
Turn & Talk

1. How does a marine reserve differ from a marine protected area? Why do many fishers oppose marine reserves? Explain why many scientists say no-take reserves will be good for fishers.