

# Shark Marine Protected Areas: A specific approach to conserving sharks and rays

ANA NOEL

APRIL 4<sup>TH</sup>

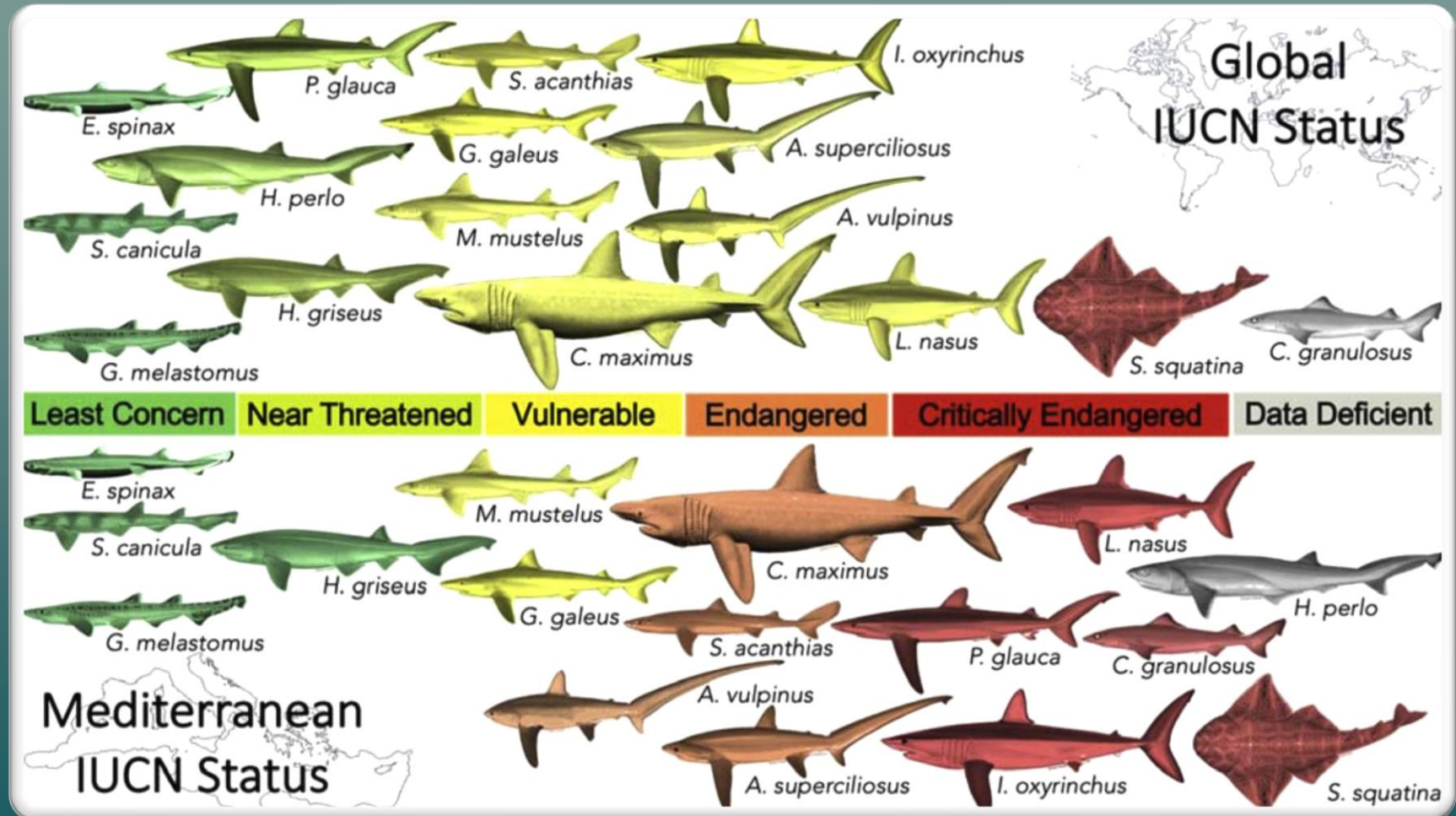
MAR 315





# Sharks and Rays

- ▶ Chondrichthyes most threatened group in ocean
- ▶ 24% of shark and ray populations threatened
- ▶ Bycatch and overfishing
- ▶ 2010- 63-273 million sharks killed
  - ▶ Cannot recover
  - ▶ Slow growth
  - ▶ Late maturation
  - ▶ Low fecundity

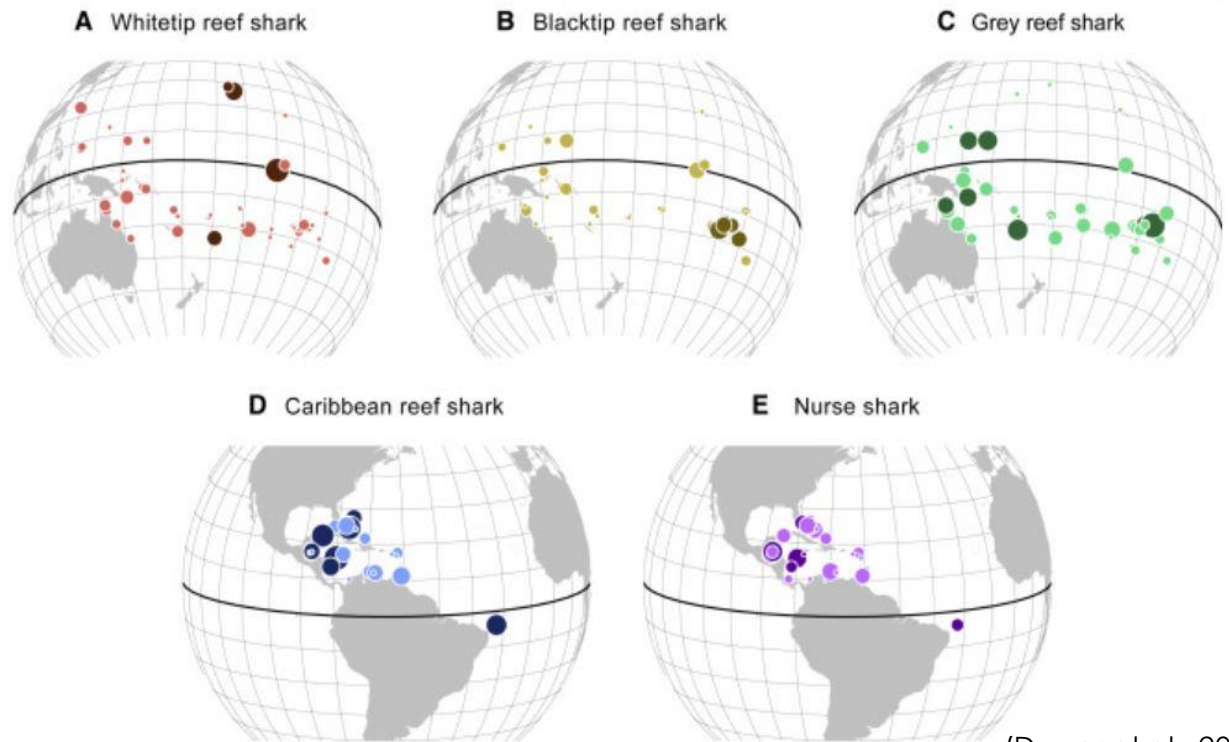


# Problems with Marine Protected Areas

- ▶ Too small- 5 km
  - ▶ Recommend 50 km
- ▶ Protecting sharks is goal
- ▶ Sharks migrate
  - ▶ Whitetip reef sharks
  - ▶ Blacktip reef sharks
  - ▶ Grey reef sharks
  - ▶ Caribbean reef sharks
  - ▶ Nurse sharks



(Shiffman, 2020)

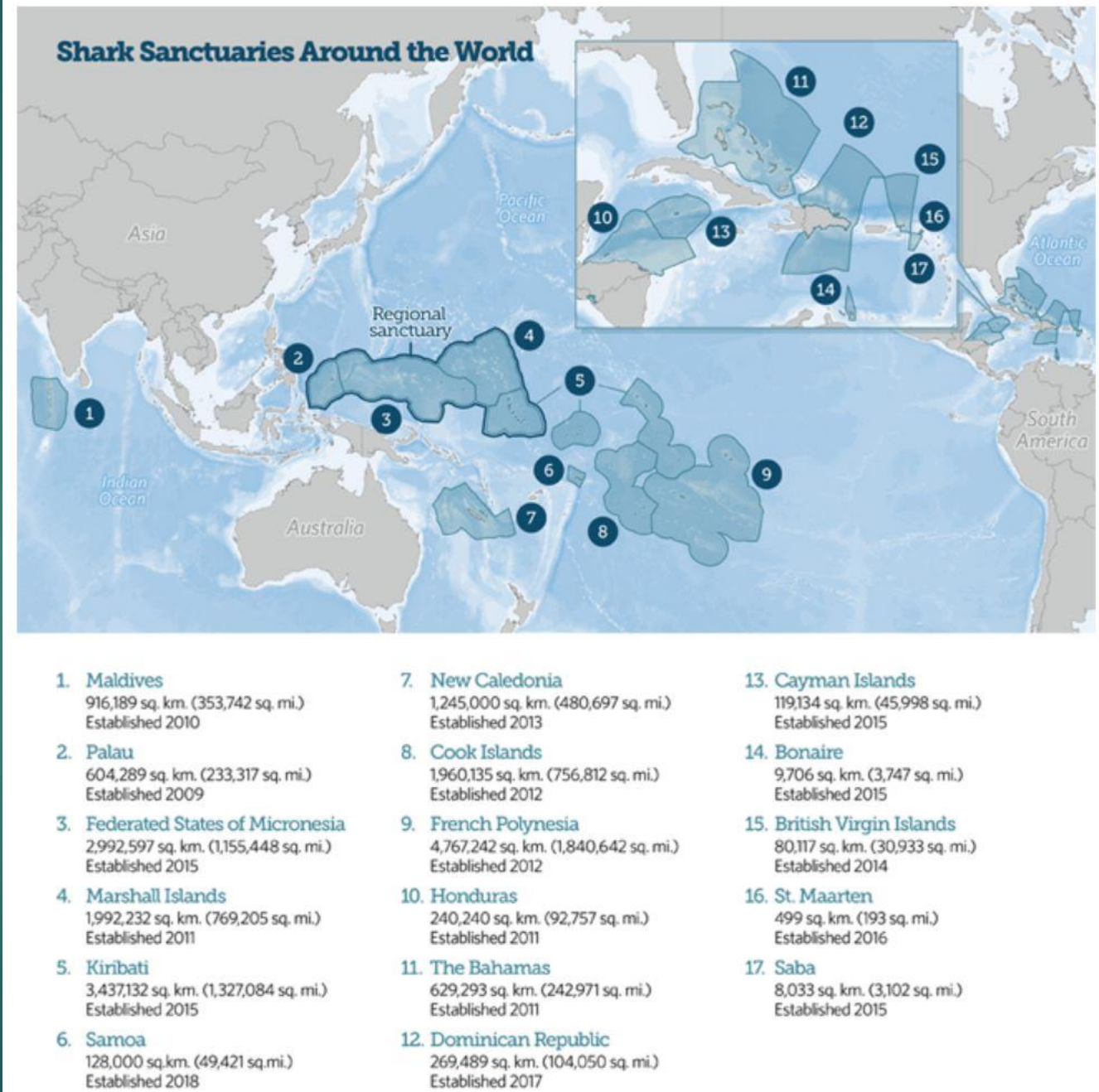


(Dwyer et al., 2020)



# Solution: Shark Marine Protected Areas

- ▶ Shark sanctuaries
- ▶ Larger than MPAs
- ▶ >3% of World's oceans (15,610,219 km<sup>2</sup>)
- ▶ EEZ zones
- ▶ Prohibit fishing
- ▶ Bycatch
- ▶ Possession, trade, and sale
- ▶ Penalties
- ▶ Different countries have different regulations



# Regulations

## Fines

- ▶ British Virgin Islands: >\$1000
- ▶ Federated States of Micronesia: \$50,000-\$250,000

## Species

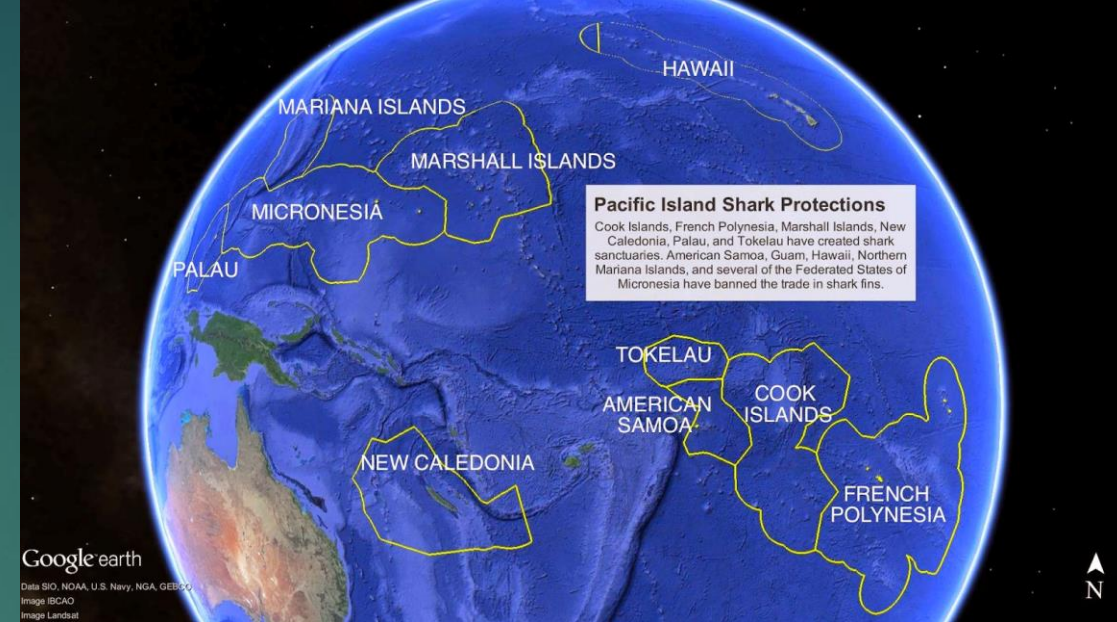
- ▶ Maldives: Elasmobranchii, to include rays, skates and sawfish
- ▶ French Polynesia: Elasmobranchii, with the exception of rays

## Permits

- ▶ Marshall Islands: permits for research on sharks
- ▶ British Virgin Islands: educational, scientific, or research purposes if you have a marine scientific research permit

## Catching a shark

- ▶ Maldives: illegal to harm any of the animals listed
- ▶ Bahamas: prohibited to fish sharks, and they must be released unharmed





# Palau

## About

First shark MPA (2009)

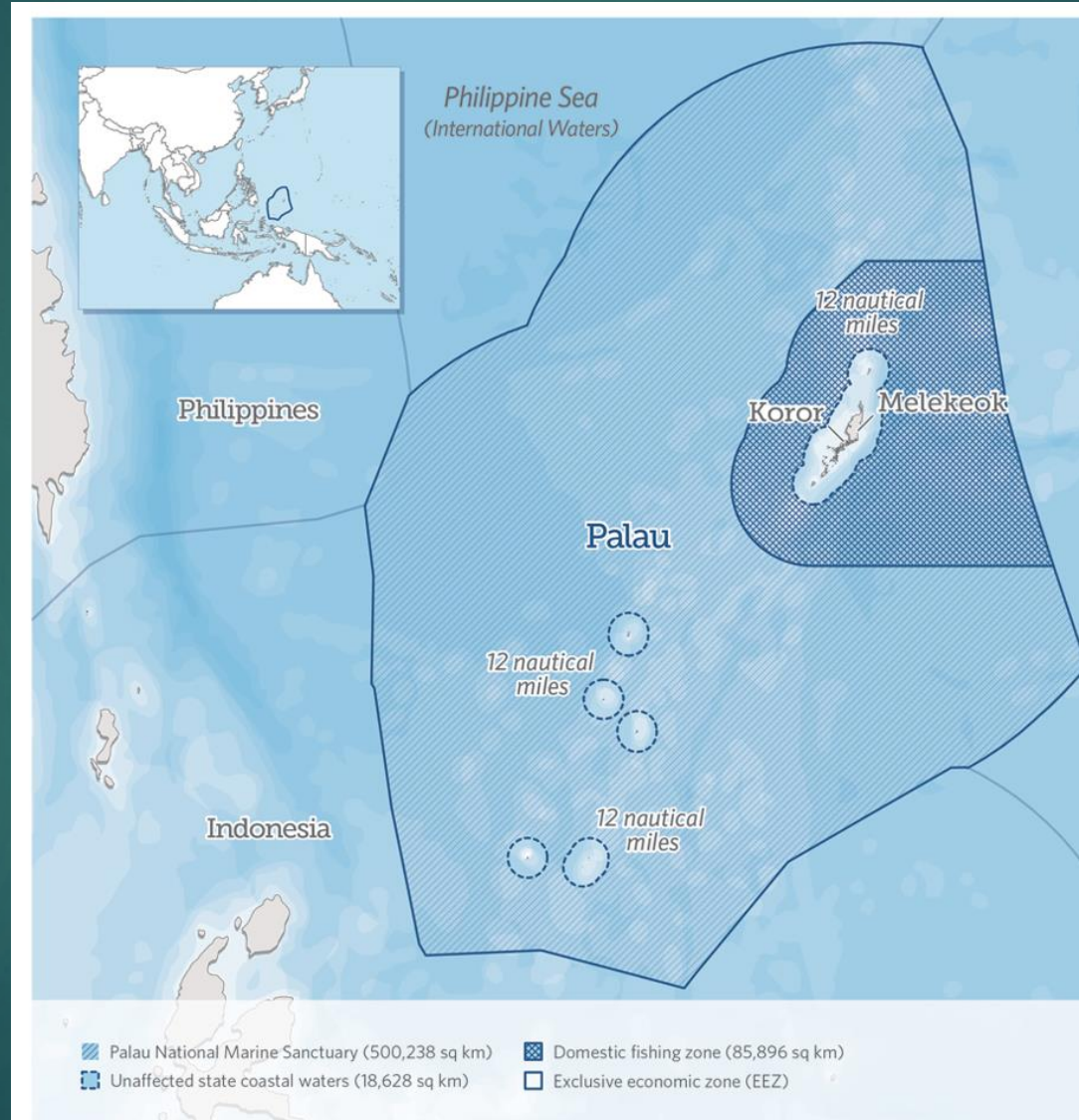
Many countries followed

629,000 km<sup>2</sup>

Large fishing area- tuna and sharks

135 shark and ray species

- Grey reef shark
- Leopard shark
- Whitetip reef shark



## Restrictions

All commercial shark fishing

- Small scale
- Release if caught

Shark finning

Bottom trawling

Possession of any part of shark

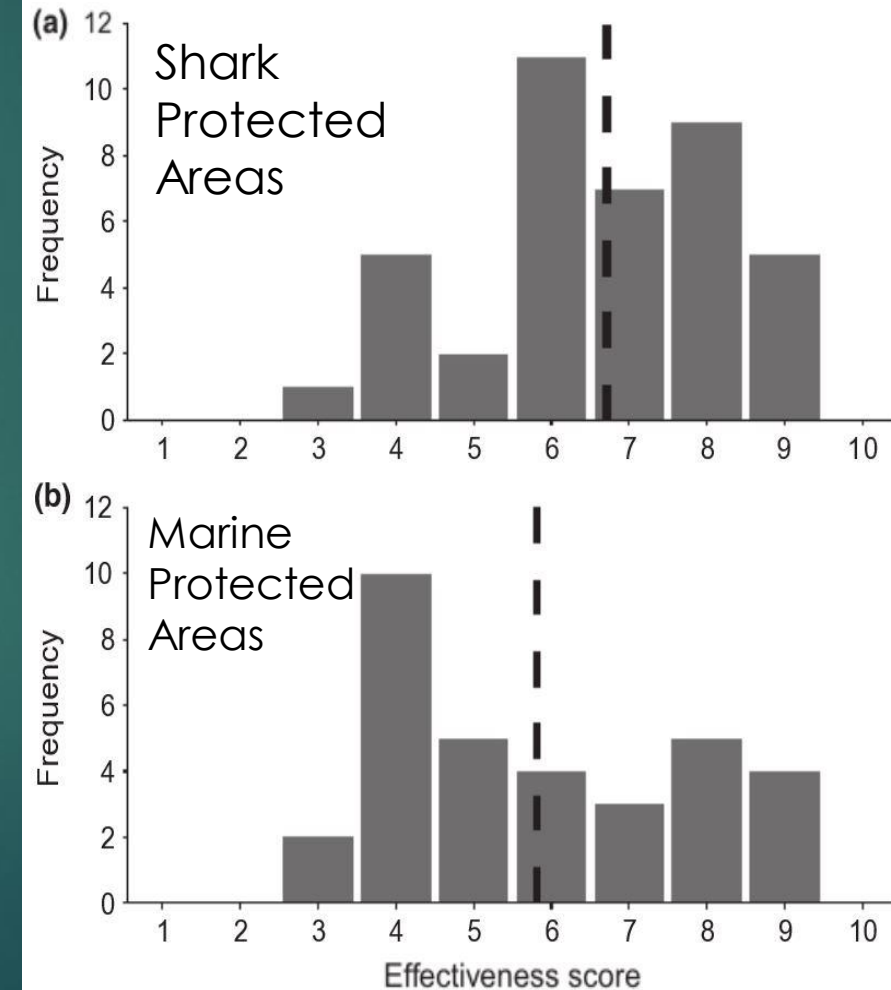
2014- Area the size of France with no fishing allowed

\$250,000 fine

Exception: vessels and businesses owned by Palauan citizens

- Bureau of Marine Resources
- Division of Marine Law
- Once per month
- Personal or traditional use

# Are Shark MPAs effective?



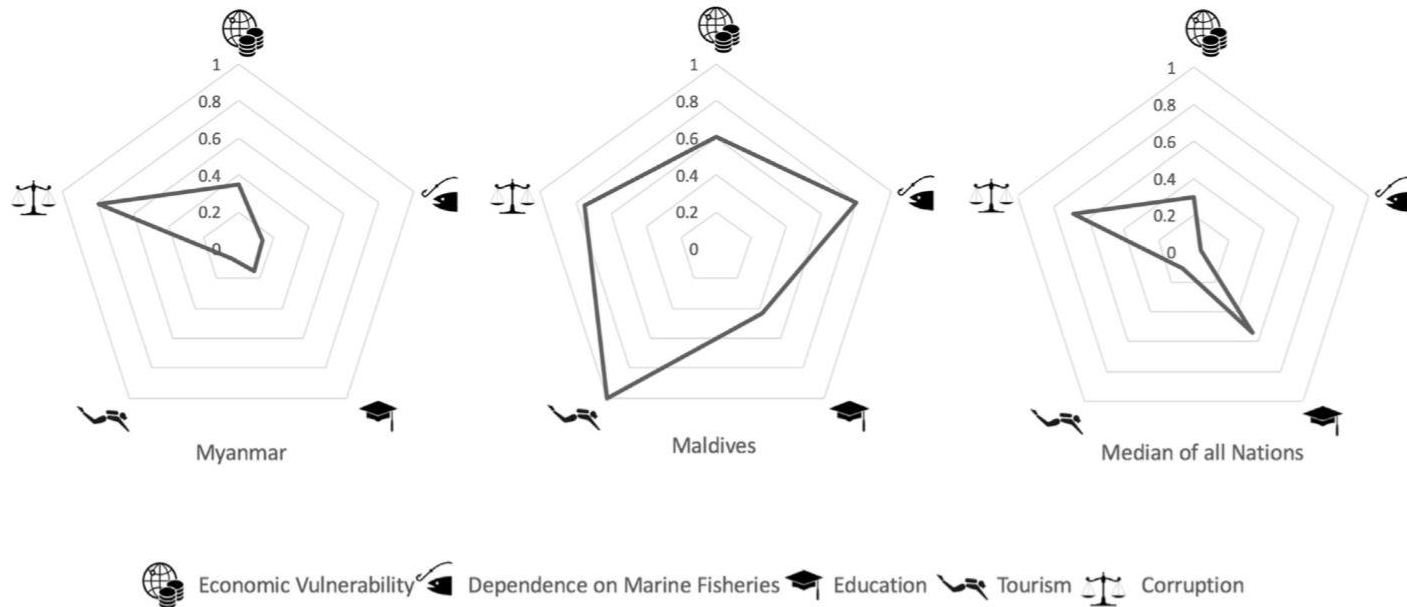
## Pros

- ▶ Protect key life stages
- ▶ Protect lesser known species
- ▶ Reduce bycatch of sharks
- ▶ Easier to catch people
  - ▶ Can tell a shark from other fish species
- ▶ Brings awareness
- ▶ Larger than MPAs

# Pros and cons of shark MPAs

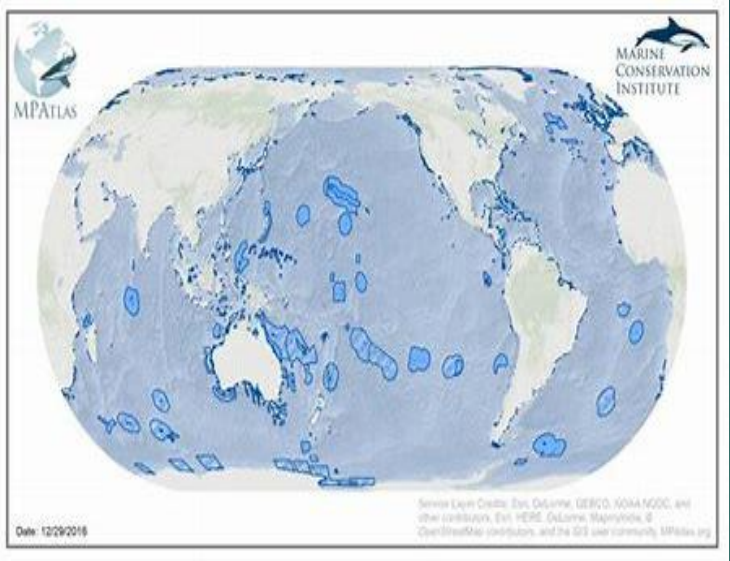
## Cons

- ▶ New
- ▶ Don't restrict all types of fishing
- ▶ If caught as bycatch, shark may still die
- ▶ Harder to enforce because bigger area
- ▶ Migration
- ▶ Only >3% of World's oceans
- ▶ Some countries rely on sharks
- ▶ Doesn't protect against other threats
- ▶ Some don't protect rays



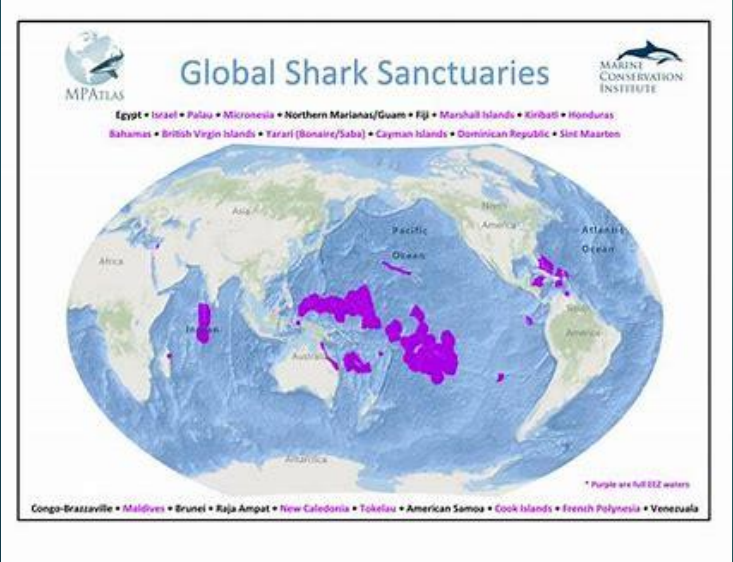


# Marine Protected Areas



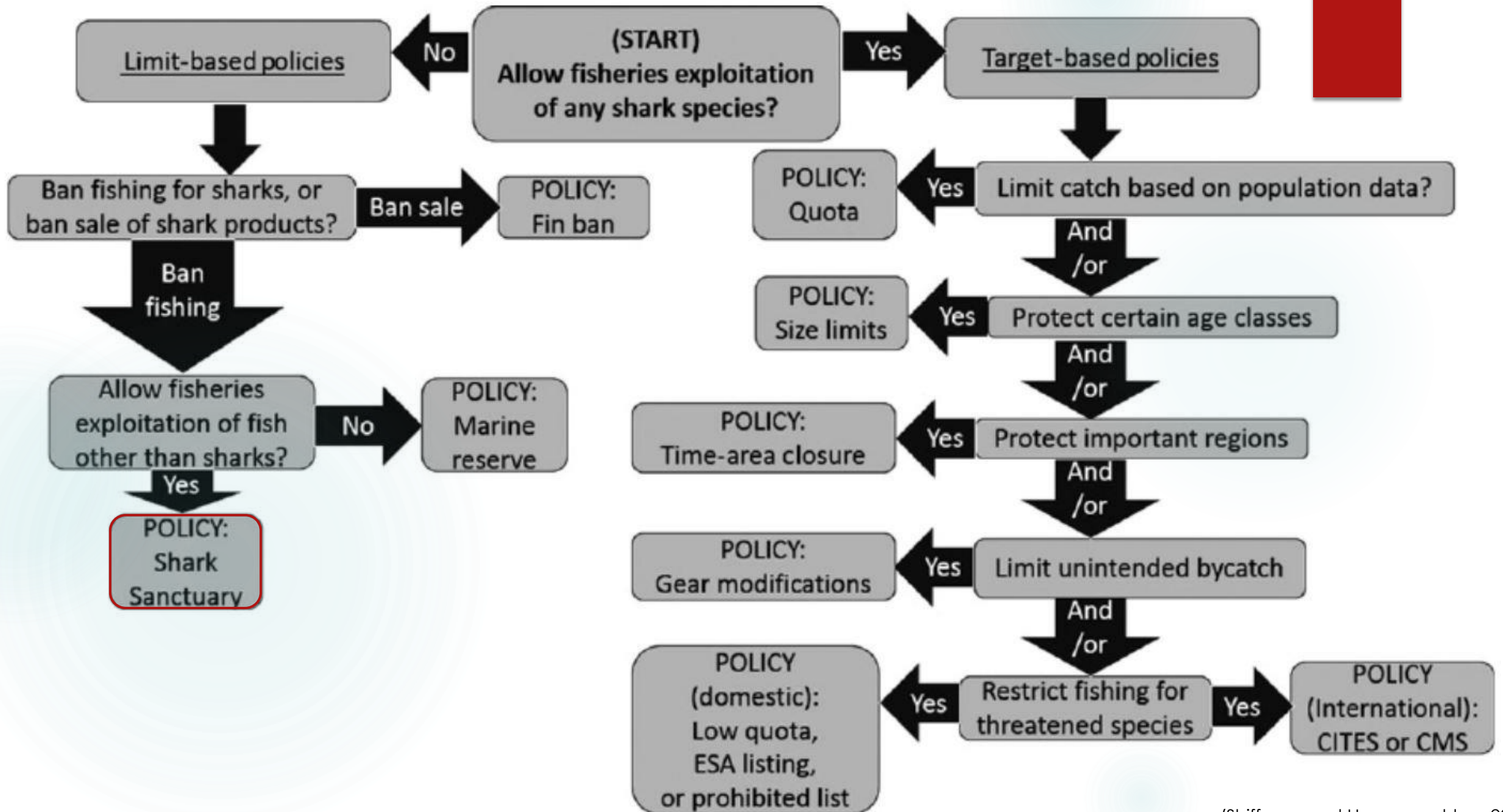
# Other Conservation methods

# Shark Marine Protected Areas



	Permits	Quotas	Gear restrictions	Time/area closure	Fin:Carcass Ratio	Fins naturally attached	Species harvest ban	CITES Appendix I	CITES Appendix II	Endangered species act	Size limit	Fin bans	Marine reserve	Shark sanctuary
Allows for fisheries exploitation of some species	X	X	X	/	X	X	X	X	X	X	X	/		
Regulates total catch/control scale of fishery	X	X		/			/	/	/		/			
Regulates harvest of particularly threatened species		X							X		/			
Bans all harvest of particularly threatened species		/					X	X						
Bans harvest of all species of sharks				/									X	X
Bans all fishing in an area				/									X	
Reduces unintended bycatch			X	/								X		
Reduces inhumane and wasteful practice of finning					/	X							X	X
Restrict or ban the sale of shark fins												X		
Protects important life history stages/regions			X								X		X	X
Requires detailed scientific data	/	X	X	X			X	X	X	X	X		/	

(Shiffman and Hammerschlag, 2016)





# Scientific Resources

- ▶ Dwyer, R. G., Krueck, N. C., Udyawer, V., Heupel, M. R., Chapman, D., Pratt Jr, H. L., and Simpfendorfer, C. A. (2020). Individual and population benefits of marine reserves for reef sharks. *Current Biology*, 30(3), 480-489.
- ▶ MacKeracher, T., Diedrich, A., and Simpfendorfer, C. A. (2019). Sharks, rays and marine protected areas: A critical evaluation of current perspectives. *Fish and Fisheries*, 20(2), 255-267.
- ▶ Mizrahi, M., Duce, S., Pressey, R. L., Simpfendorfer, C. A., Weeks, R., and Diedrich, A. (2019). Global opportunities and challenges for shark large marine protected areas. *Biological conservation*, 234, 107-115.
- ▶ Shiffman, D. S. (2020). Marine Conservation: Reef Sharks Need Bigger Protected Areas. *Current Biology*, 30(3), R117-R118.
- ▶ Shiffman, D. S., and Hammerschlag, N. (2016). Shark conservation and management policy: a review and primer for non-specialists. *Animal Conservation*, 19(5), 401-412.
- ▶ Vianna, G. M., Meekan, M. G., Ruppert, J. L., Bornovski, T. H., and Meeuwig, J. J. (2016). Indicators of fishing mortality on reef-shark populations in the world's first shark sanctuary: the need for surveillance and enforcement. *Coral reefs*, 35(3), 973-977.
- ▶ Ward-Paige, C. A. (2017). A global overview of shark sanctuary regulations and their impact on shark fisheries. *Marine Policy*, 82, 87-97.
- ▶ Ward-Paige, C. A., and Worm, B. (2017). Global evaluation of shark sanctuaries. *Global Environmental Change*, 47, 174-189.

# Pictures and Websites

- ▶ Beckius, K. (2019, June 29). New England's Best Animal Adventures. Retrieved May 03, 2020, from <https://www.tripsavvy.com/new-englands-best-animal-adventures-1600128>
- ▶ Shark Sanctuaries. (n.d.). Retrieved May 04, 2020, from <https://marine-conservation.org/mpatlas/shark-sanctuaries/>
- ▶ Frerck, R. (n.d.). Technology Helps Protect Marine Protected Areas. Retrieved May 04, 2020, from <https://blueocean.net/technology-helps-protect-marine-protected-areas/>
- ▶ Defenders, S. (1970, January 01). What Is a National Shark Sanctuary? Retrieved May 04, 2020, from <http://www.sharkdefenders.com/2014/08/what-is-shark-sanctuary.html>
- ▶ Lubba, C. (2017, November 15). The Palau Shark Sanctuary and 4 Shark Species in Palau You will Encounter. Retrieved May 04, 2020, from <https://palaudiveadventures.com/palau-shark-sanctuary/>
- ▶ Heilprin, J. (2009, September 25). Palau creates world's first shark sanctuary. Retrieved May 04, 2020, from <https://phys.org/news/2009-09-palau-world-shark-sanctuary.html>
- ▶ Palau National Marine Sanctuary. (n.d.). Retrieved May 04, 2020, from <https://www.pewtrusts.org/en/research-and-analysis/fact-sheets/2015/09/palau-national-marine-sanctuary>
- ▶ Shark Sanctuaries Around the World. (n.d.). Retrieved May 04, 2020, from <https://www.pewtrusts.org/en/research-and-analysis/fact-sheets/2016/03/shark-sanctuaries-around-the-world>
- ▶ UBCnews. (n.d.). Official stats mask shark and ray species caught in the Mediterranean and Black seas. Retrieved May 04, 2020, from [https://www.eurekalert.org/pub\\_releases/2019-04/uobc-osm040519.php](https://www.eurekalert.org/pub_releases/2019-04/uobc-osm040519.php)