SHARKS

Studying sharks

College of Marine Sciences Shanghai Ocean University

2017

Studying sharks

- The study of sharks is sometimes called elasmobranchology.
- Knowing more about sharks, such as how they breed and what they need to survive will help us to conserve them and stop shark species from dying out.
- Some scientists study shark cells to try to find out why they get so few diseases. This information could help to make new medicines.
- Genetic analysis of shark DNA helps scientists to identify closely related shark species, which look very similar and are difficult to distinguish from their appearance alone.

Sharks in trouble

- Shark populations are falling mainly because of human activities such as hunting and overfishing.
- Sharks are killed when they get caught in nets put up to protect swimmers from shark attacks, or nets meant to catch other fish.
- Sharks caught for sport are usually released, but often die from exhaustion soon afterwards.
- Sharks mature slowly and don't bear many young, so it can be hard for a species to build up their numbers again after being overfished.

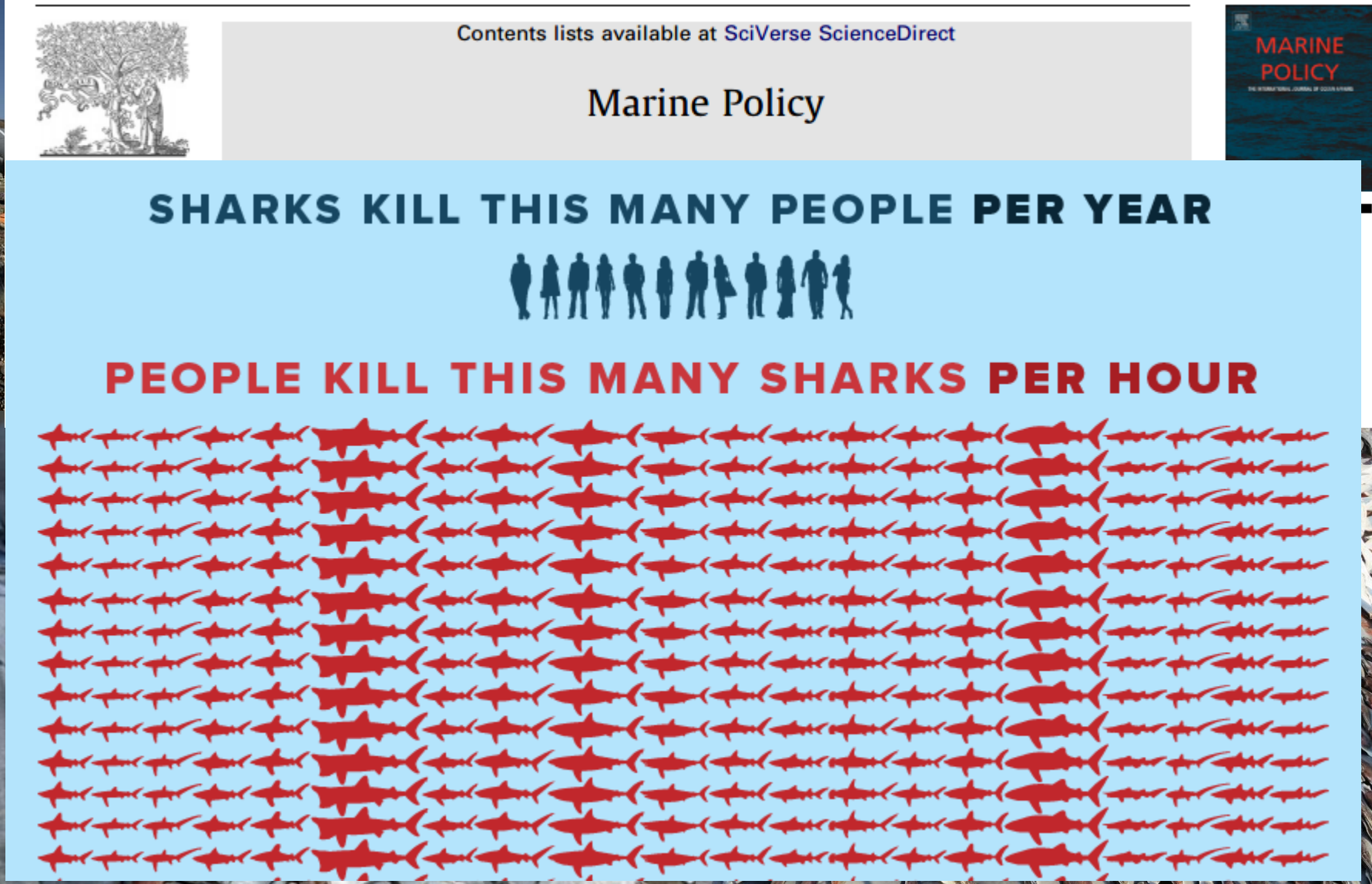
Sharks in trouble

- Sharks are at the top of the food chain. Poisonous chemicals from pollution collect in sea creatures, which the sharks eat. The poison then builds up in the sharks' bodies. Scientists think this may make sharks ill and make it harder for them to reproduce.
- Young sharks often use shallow coastal waters as nursery areas. These areas are regularly polluted by human sewage and other waste.
- Shark fin soup.

Marine Policy 40 (2013) 194–204

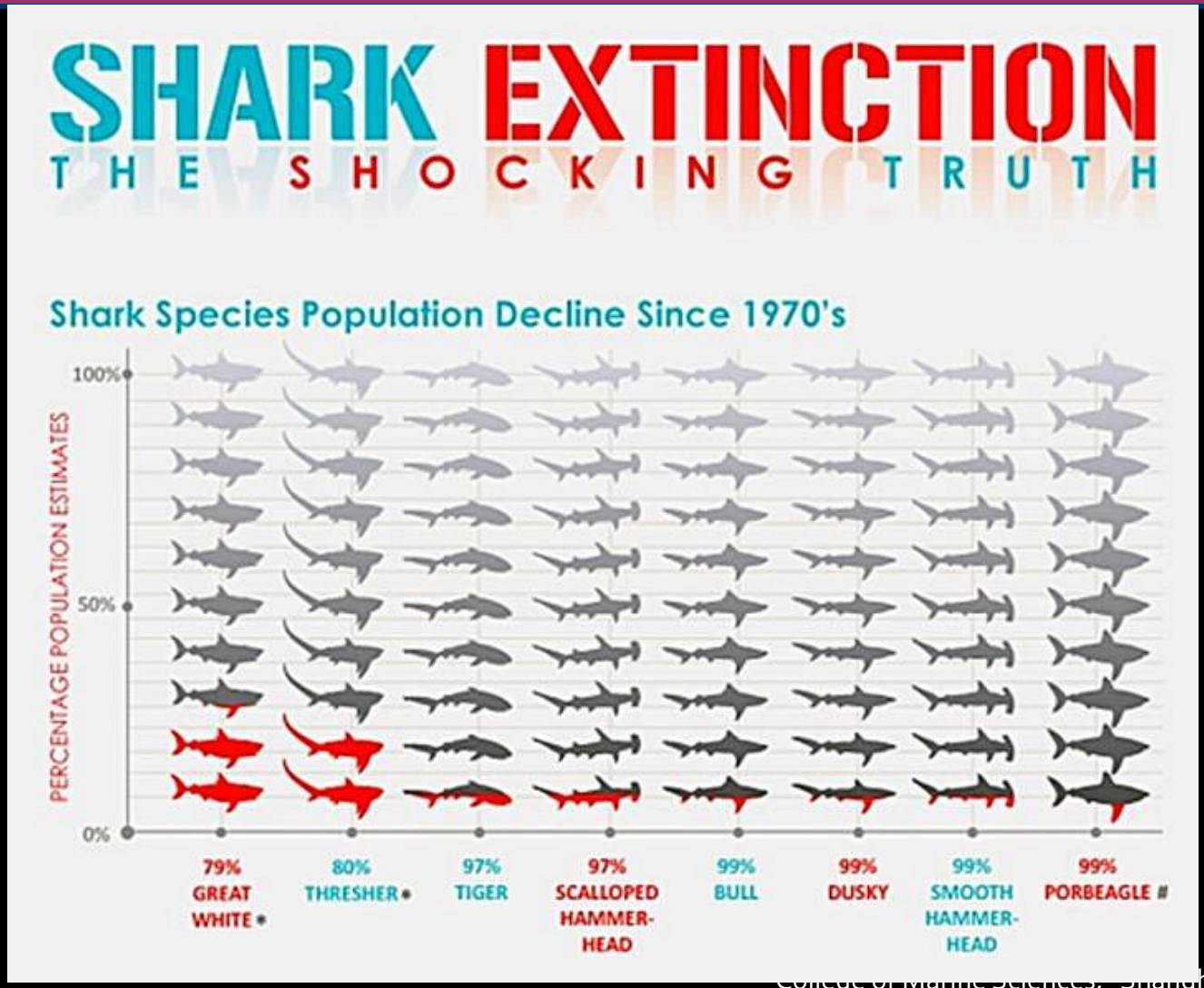
Contents lists available at SciVerse ScienceDirect

Marine Policy



http://mission-blue.org/2013/01/hong-kong-shark-fin-traders-take-to-the-rooftops/

鲨鱼资源量


SHARK EXTINCTION
THE SHOCKING TRUTH
Shark Species Population Decline Since 1970's
PERCENTAGE POPULATION ESTIMATES
100%
50%
0%
79% GREAT WHITE
80% THRESHER
97% TIGER
97% SCALLOPED HAMMER-HEAD
99% BULL
99% DUSKY
99% SMOOTH HAMMER-HEAD
99% PORBEAGLE

附录2

2002

2002

2004

2013

2013

2013

2013

2013

2017

2017

2017

2017

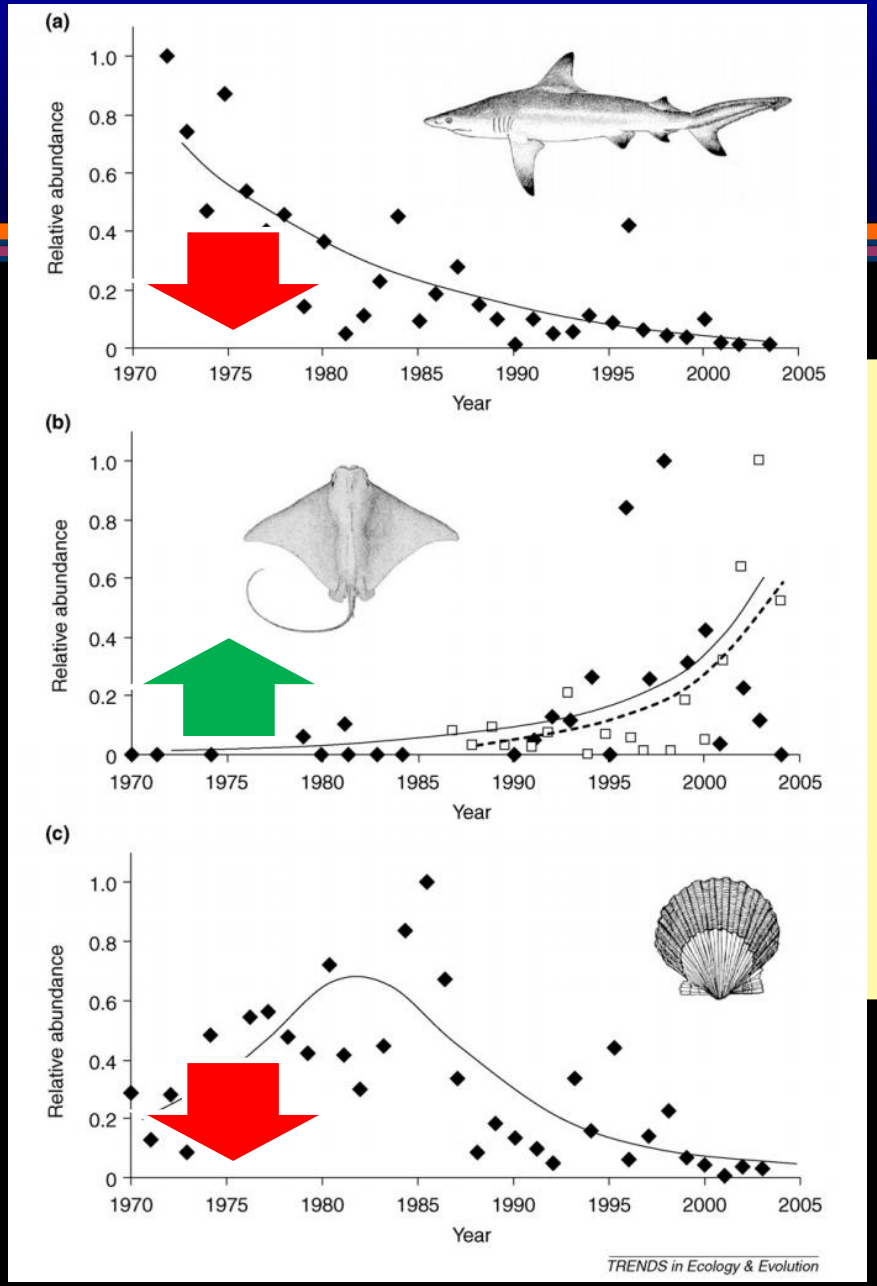
Are they important to the Ocean?

Sharks are important

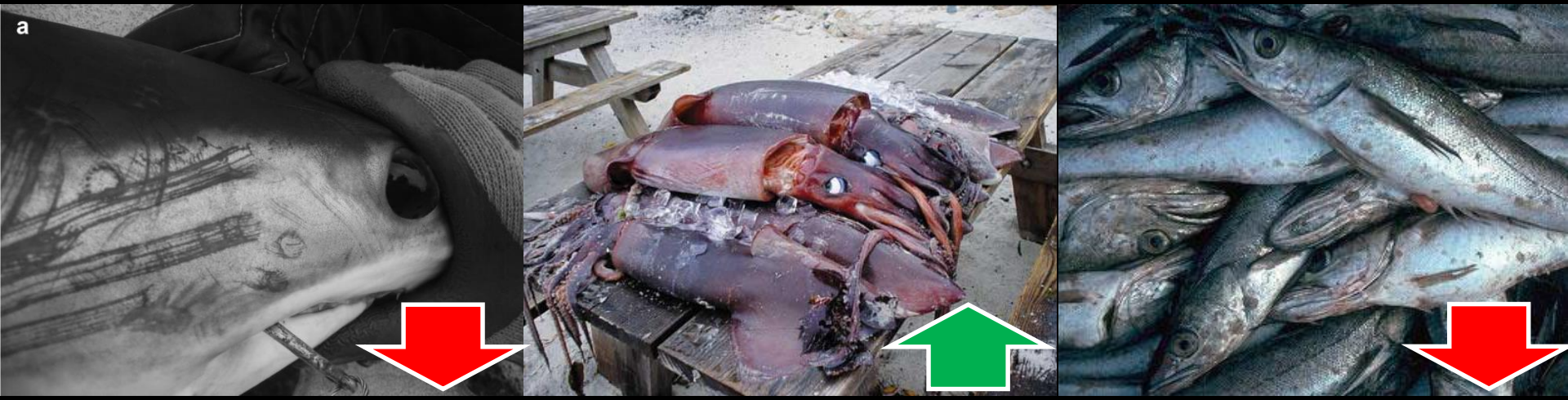
顶级捕食者

次级捕食者

资源生物



- Vetter et al. (2008) used data from just about every research technique available to study interactions between the mako and Humboldt squid populations in the California current.



(*PANS*, 2008)

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Habitat use and foraging behavior of tiger sharks (*Galeocerdo cuvier*) in a seagrass ecosystem

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Abstract Understanding the foraging behavior and spatial distribution of top predators is crucial to gaining a complete understanding of communities. However, studies of top predators are often logistically difficult and it is important to develop appropriate methods for identifying factors influencing their spatial distribution. Sharks are top predators in many marine communities, yet no studies have quantified the habitat use of large predatory sharks or determined the factors that might influence shark spatial distributions. We used acoustic telemetry and animal-borne video cameras ("Crittercam") to test the hypothesis that tiger shark (*Galeocerdo cuvier*) habitat use is determined by the availability of their prey. We also used Crittercam to conduct the first investigation of foraging behavior of tiger sharks. To test for habitat preferences of sharks, the observed proportion of time in each habitat for each individual was compared to the predicted values for that individual based on correlated random walk and track randomization methods. Although there was individual variation in habitat use, tiger sharks preferred shallow seagrass habitats, where their prey is most abundant. Despite multiple encounters with potential prey, sharks rarely engaged in prolonged high-speed chases, and did not attack prey that were vigilant. We propose that the tiger sharks' foraging tactic is one of stealth, and sharks rely upon close approaches to prey in order to be successful. This study shows that using appropriate analysis techniques and a variety of field methods it is possible to elucidate the factors influencing habitat use and gain insights into the foraging behavior of elusive top predators.

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Introduction

Understanding patterns of habitat use and foraging behavior of top predators is important to gaining insight into the dynamics of communities. Patterns of habitat use determine the likelihood of both direct and indirect interspecific interactions, which can influence community structure and stability (e.g. Brown et al. 1999). Therefore, understanding the factors that influence spatial distributions of top predators is critical to predicting the consequences of environmental perturbations and human disturbance on these species and the communities they inhabit. Despite the importance of such studies, it is often difficult to gather data on top predators as they are frequently elusive, have large home ranges, and exist at low population densities. Thus, new methods with meaningful statistical tests could greatly enhance our understanding of top predators in diverse habitats.

Sharks are an example of top predators for which there is little information regarding habitat use and foraging behavior. Yet large sharks may be keystone predators, influencing the structure of ecosystems through predator-prey interactions (e.g. Heithaus 2001a ; Simpfendorfer et al. 2001). This study was undertaken to develop methods applicable for gaining insights into their habitat use and to apply new technologies to begin to understand their foraging behavior.

Studying sharks in SHOU

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- Catch and observation

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- Feeding ecology

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- Genetic analysis