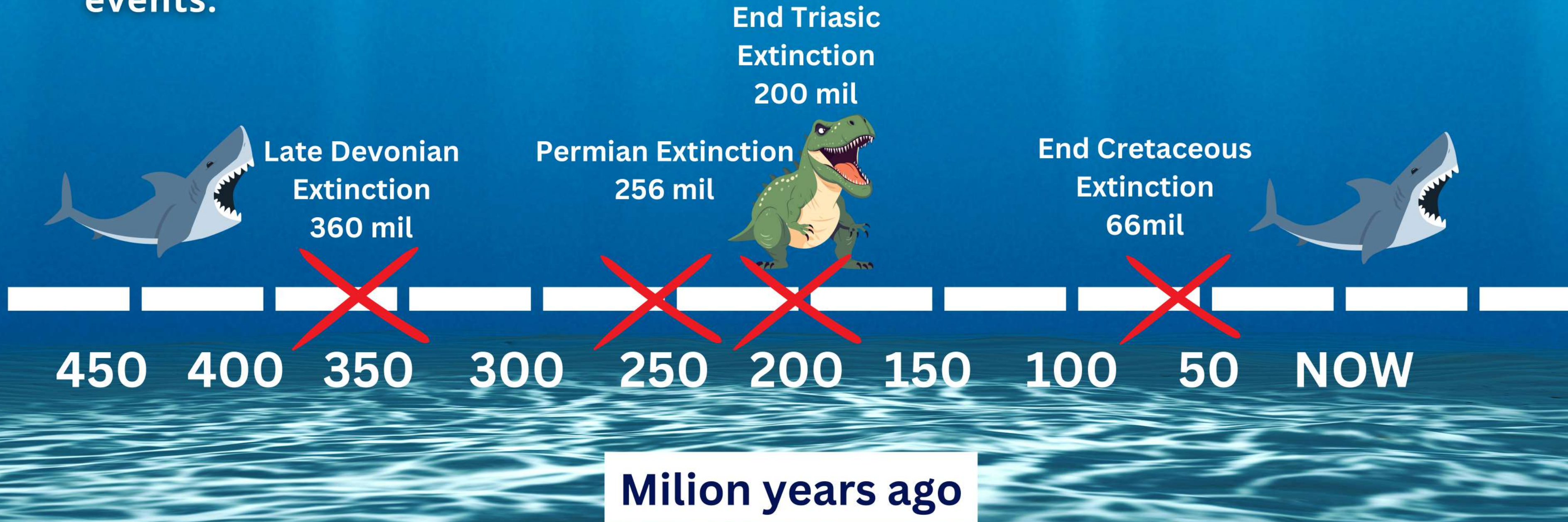


SHARKS



- Sharks have been around for a very long time, with a lineage dating back over 400 million years.
- They predate the existence of dinosaurs and have survived multiple mass extinction events.



**HOW MANY SPECIES OF SHARKS DO
YOU THINK THERE ARE?**



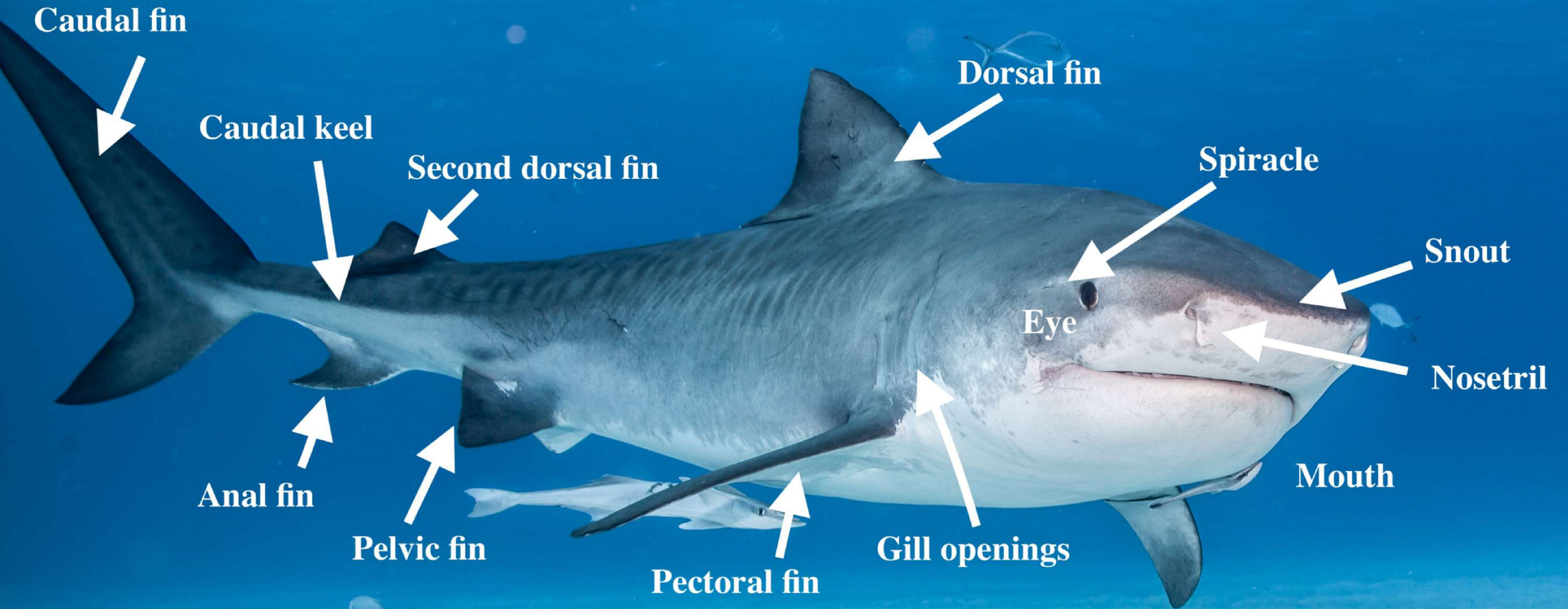
There are over 500 recognized species of sharks

- The biggest shark species: Whale Shark 12m - 18m
- The smallest shark species: Dwarf lanternshark 18cm - 20cm





Basic shark anatomy



BONES



CARTILAGE



VS

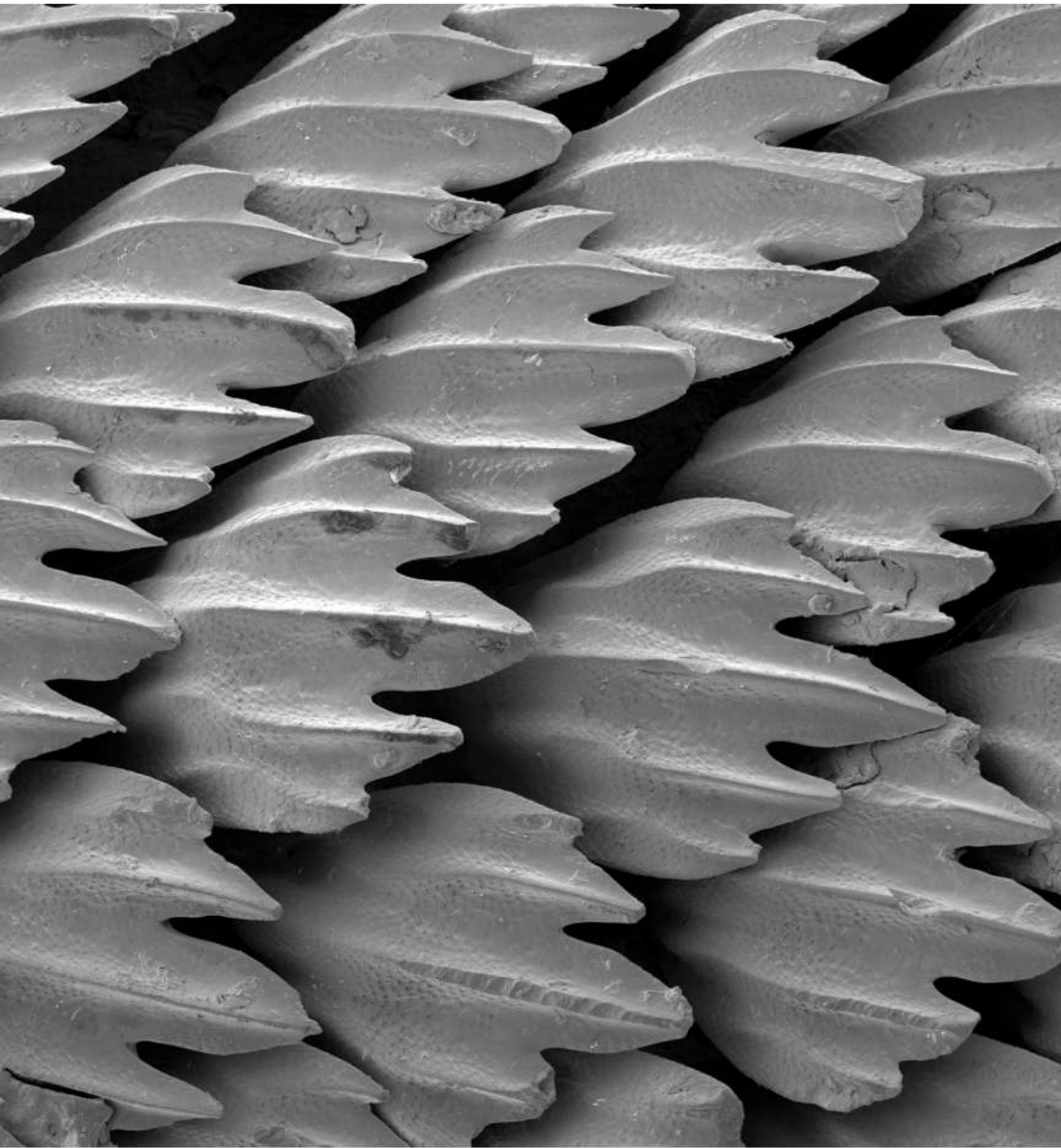


SHARK TEETH

- Sharks typically have multiple rows of teeth, with the front row being the most functional.
- The shape of a shark's teeth often provides clues about its diet.



SUPER POWERS



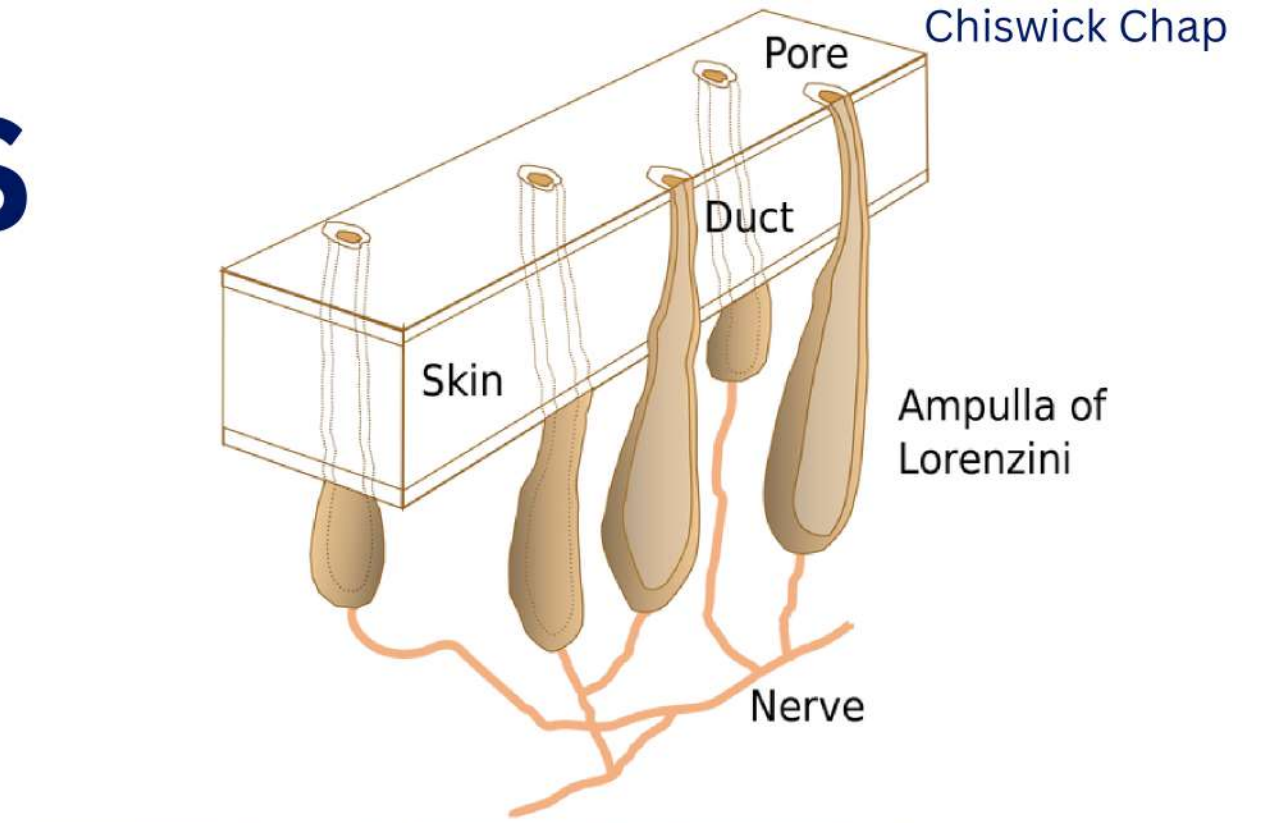
DERMAL DENTICLES

- reduce drag
- helping sense movements of nearby objects



AMPULLA OF LORENZINI

- electroreception
- detect electric fields produced by other organisms



NICTITATING MEMBRANE

- membrane that can be drawn across the eye from the inner corner
- for protection

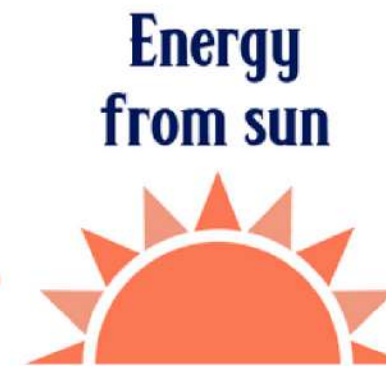
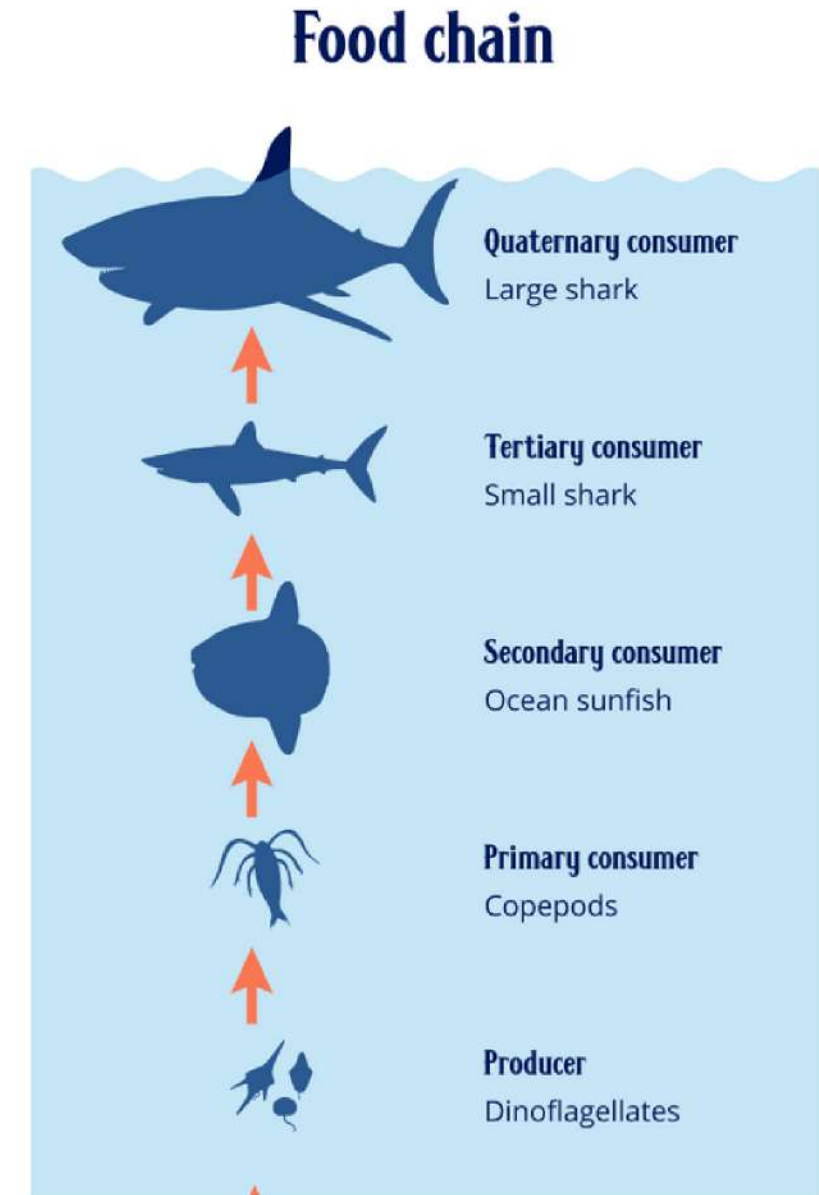
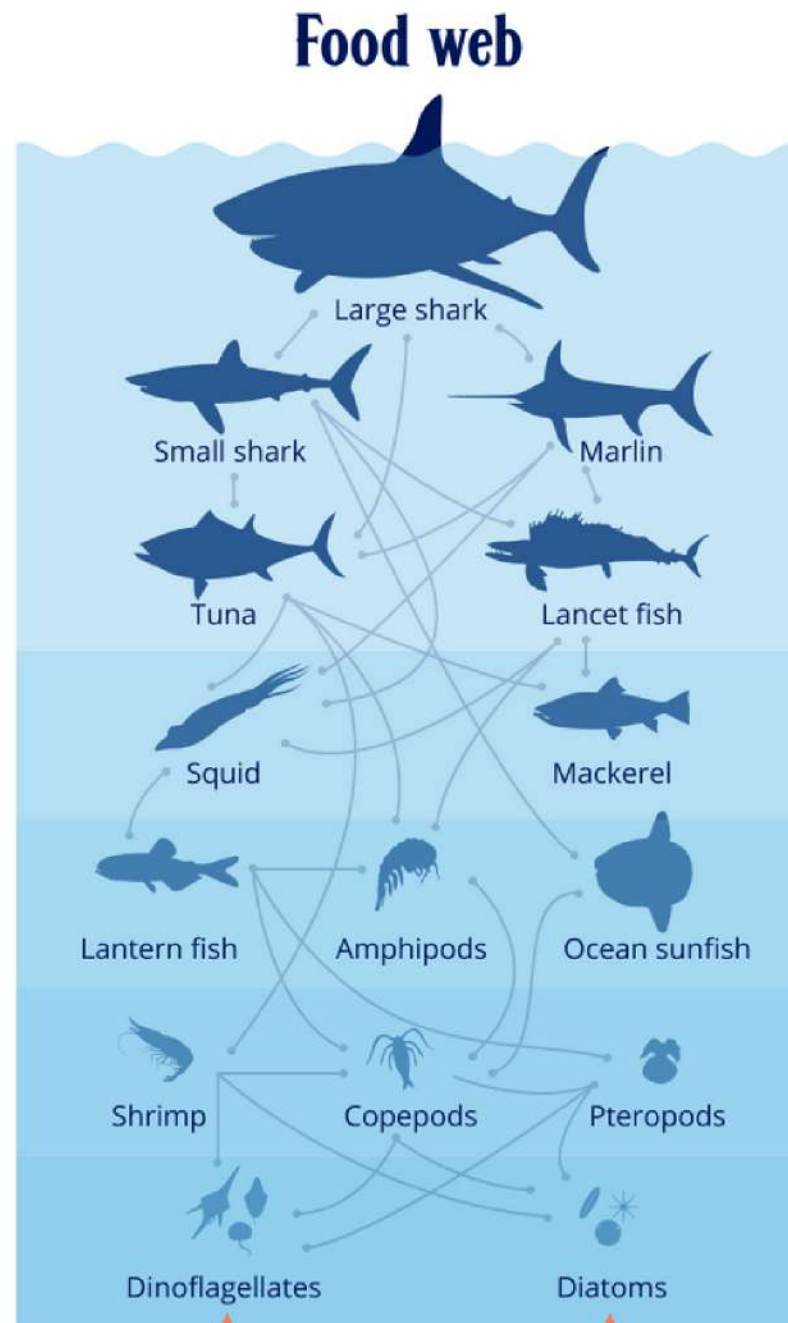


DO YOU KNOW WHY ARE SHARKS IMPORTANT?

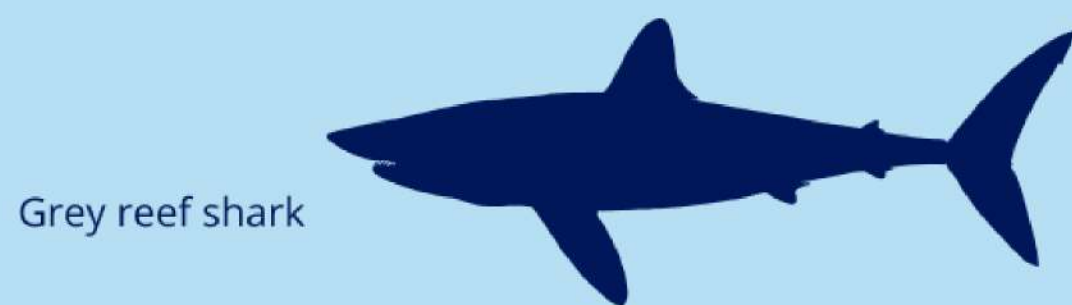
IN THIS SECTION, WE WILL EXAMINE THE IMPORTANCE OF SHARKS IN OUR ECOSYSTEMS.



- As top predators, sharks play a crucial and irreplaceable role in **maintaining the health and balance of marine ecosystems.**
- All living organisms in the ocean are connected and they deeply depend on each other. The balance between species must be kept for the health of the whole ecosystem.



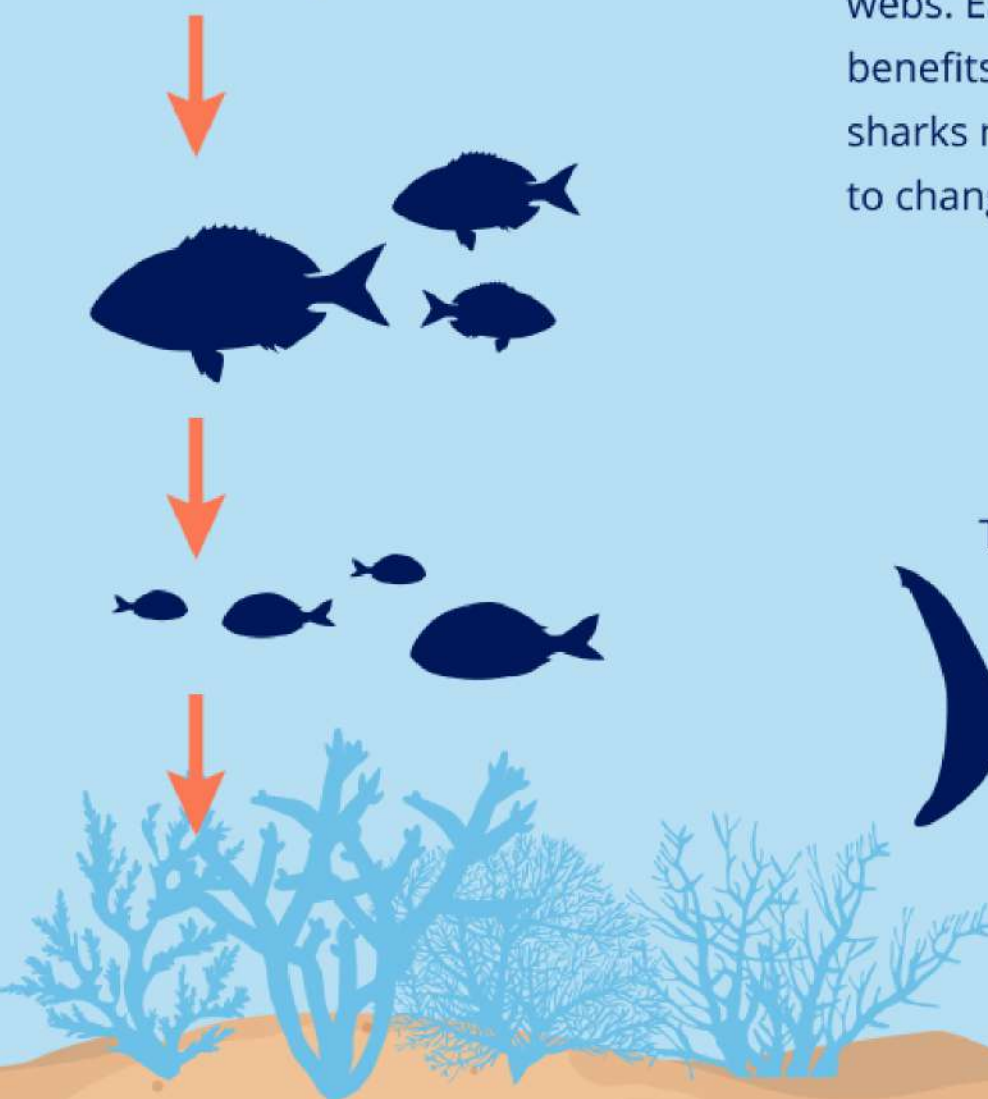
The importance of sharks



Grey reef shark

Sharks balance food webs

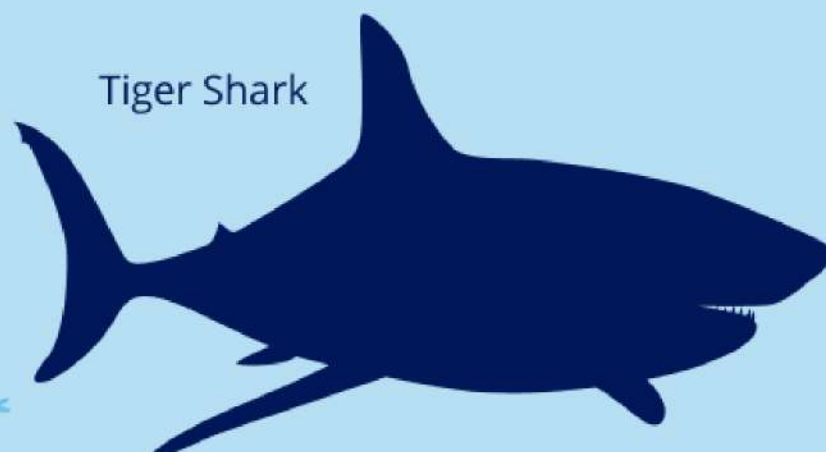
Reef sharks help control the populations of their prey and maintain intricate structure of food webs. Each fish has a role to play that benefits the entire reef and removing sharks may cause the entire system to change.



Snapper

Parrotfish

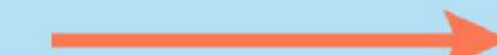
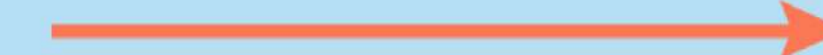
Reefs



Tiger Shark

Sharks keep prey populations healthy

Some predatory sharks are opportunistic and target sick or injured prey. Removing the weakest individual helps control the spread of diseases and ensures the healthiest fish reproduce in greater numbers.



Seagrass



Sharks keep vital habitats healthy

Tiger sharks patrol large areas of seagrass preventing their prey, such as sea turtles and dugongs, spending a long time in one area. In the absence of predators, these herbivores would overgraze seagrass beds, which are vital habitats for many species.

Dugong

Sea turtle

REPRODUCTION

- Sharks generally have **slow growth rates** and **reach sexual maturity later in life** compared to most of the fish. This means that they have fewer offspring over their lifetime.
- The slow reproductive rate makes shark populations **more vulnerable to overfishing**, as they may not be able to recover quickly from declines in numbers.

9 years



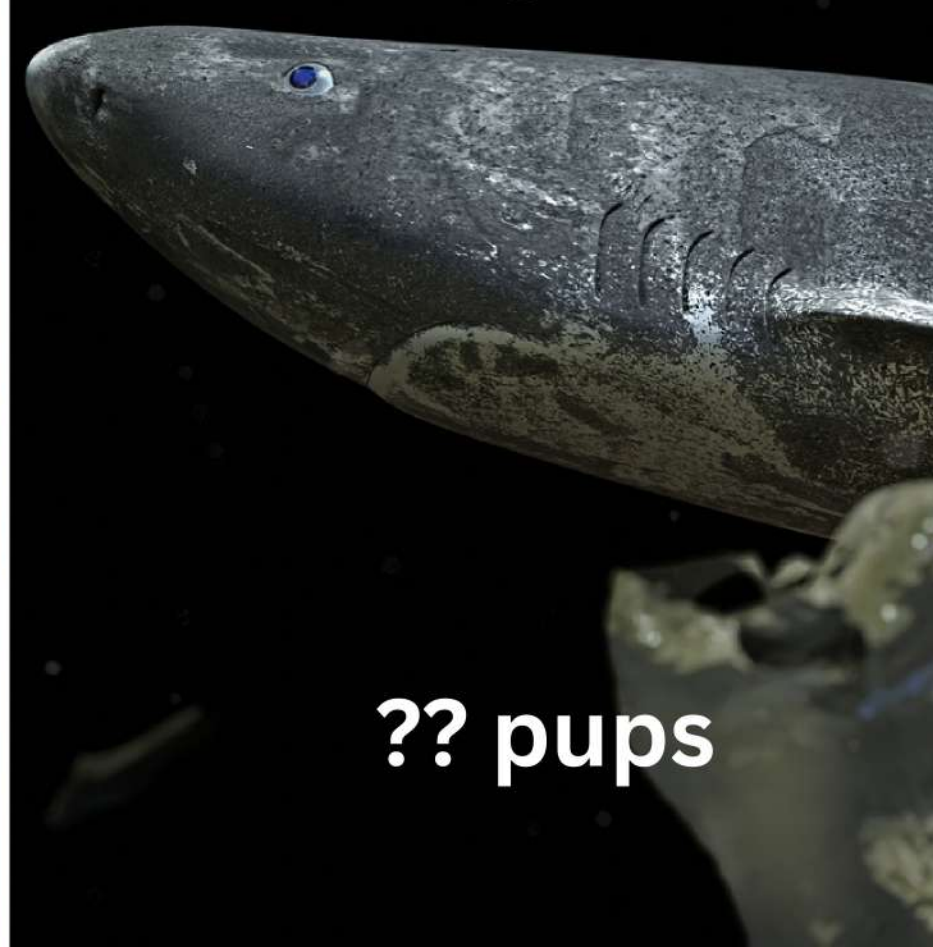
12-35 pups

35 years



2-10 pups

150 years



?? pups

4 months



80,000 to
1,000,000 eggs

OVIPARITY

(Egg- Laying)

The shark lays eggs that have tough skin unlike fish eggs



The eggs are called mermaid's purses.

OVIVIPARITY

(Egg- Carrying)

The shark carries her eggs inside until they hatch



The pups feed on yolk, a milk-like secretion from the mother, unfertilized eggs or their siblings.

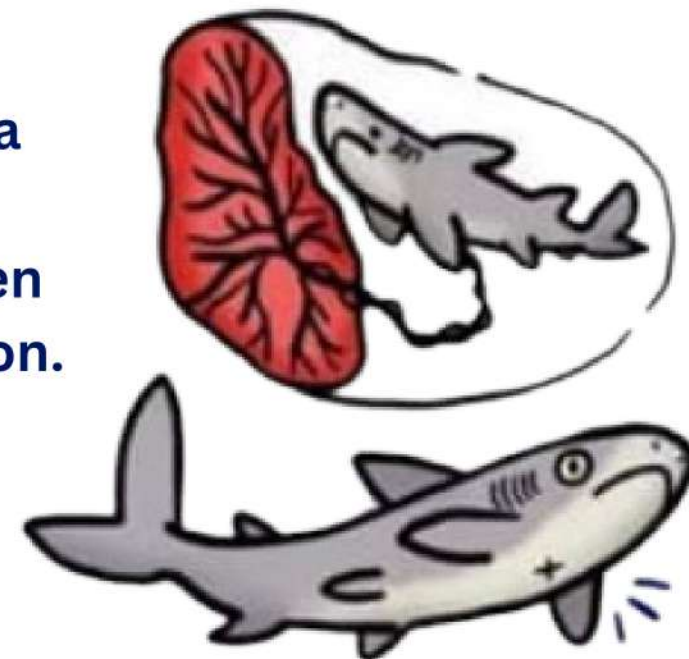
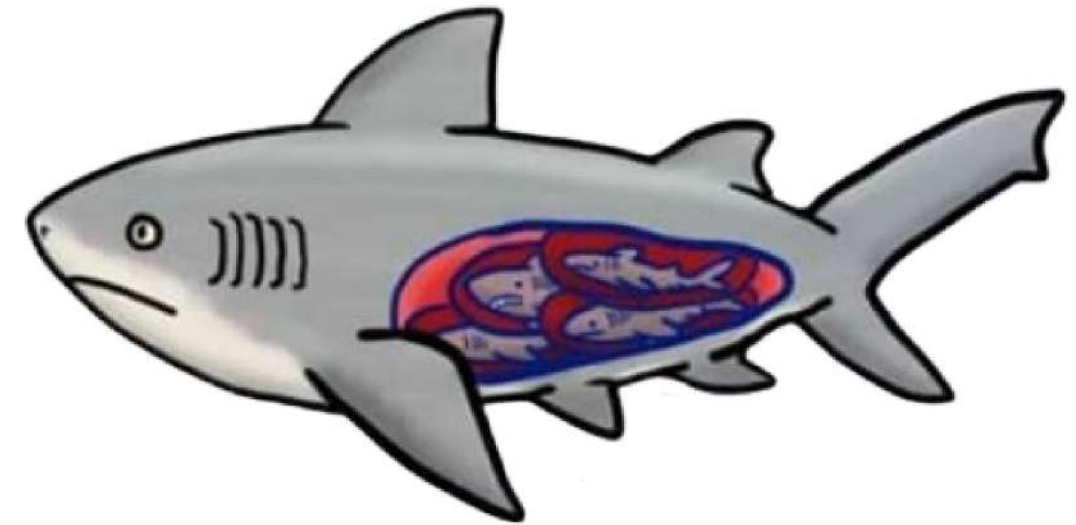


VIVIPARITY

(Live-bearing)

The shark carries the pups inside until they are ready to be born.

The pups live off a placenta (like humans) they even have a belly button.



Art by Ketrina Yim

Shark accidents/ shark attacks:



Shark attacks are **extremely rare** but sharks are apex predators in their environment and have to be treated with respect. **How to stay safe?**





You need to know that...

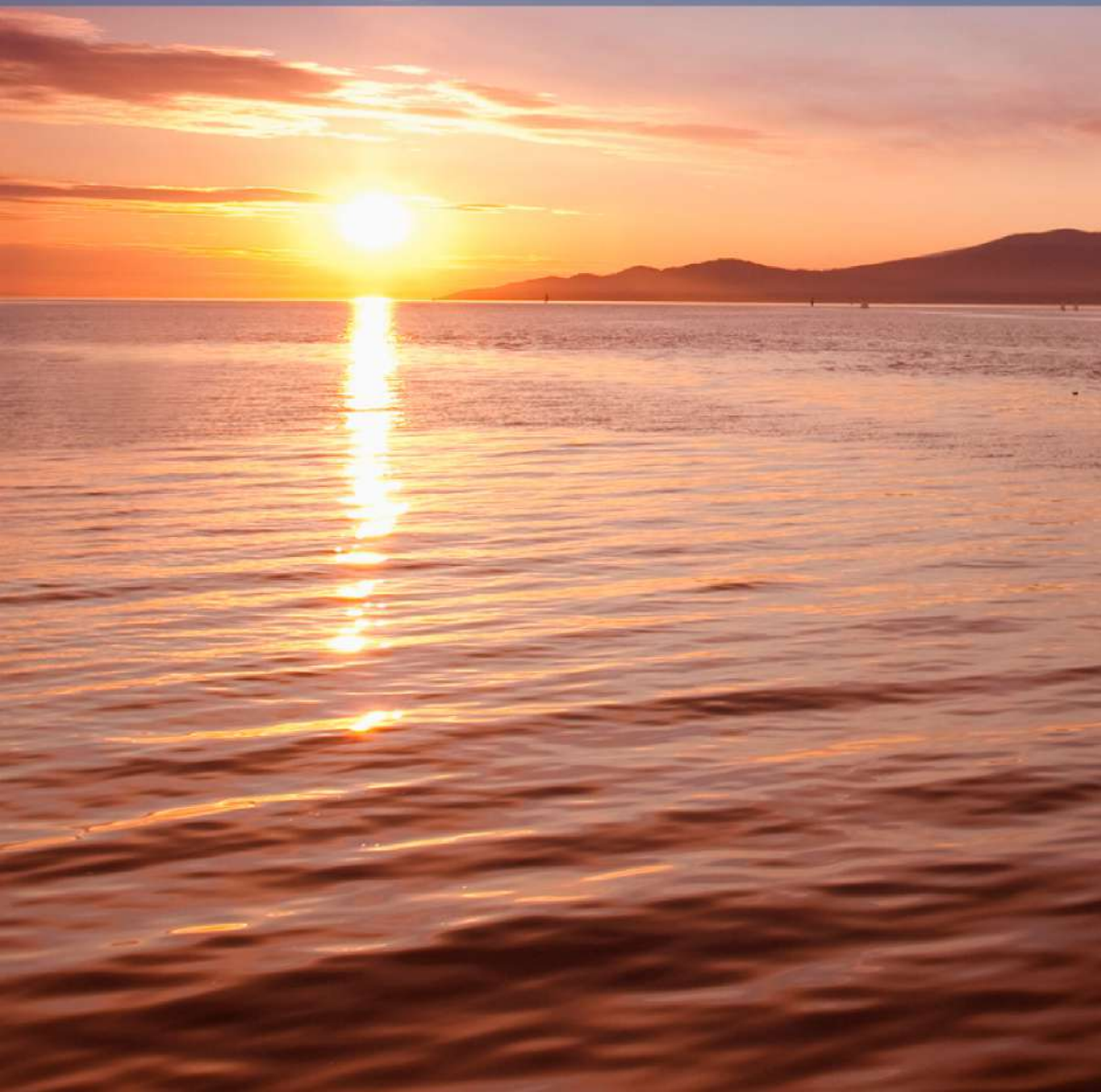
- **no shark species target people as prey** (we are not on their menu)
- no shark species kills for play or sport
- only 5-10 people are killed by sharks annually

MISTAKEN IDENTITY: most shark attacks fall into this category. When a shark bites a human it's usually because the **shark mistakes humans for its prey**. In this case, the shark takes a bite and swims away as we are not a suitable meal for them.

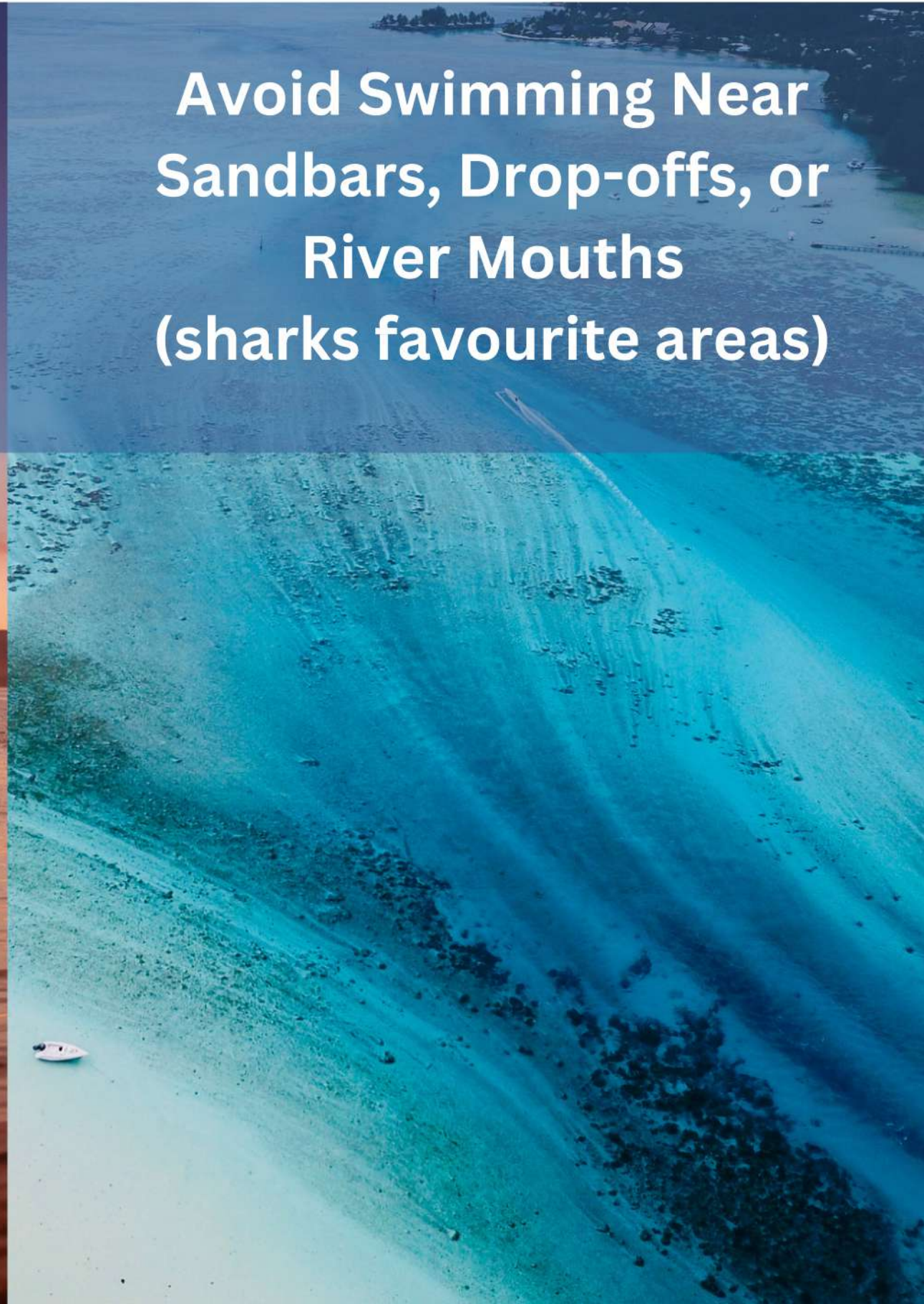
TEST BITE: In some cases, when a shark encounters an unfamiliar object or potential prey, it may engage in what is known as a **"test bite" to assess its edibility**. In most cases sharks swim away after the bite.

SAFETY FIRST

Avoid Swimming During Dawn, Dusk or Night (feeding time + low visibility)



Avoid Swimming Near Sandbars, Drop-offs, or River Mouths (sharks favourite areas)



If you encounter a shark. Don't panic, stay calm, and maintain eye contact.

(BE READY TO REDIRECT IF THE SHARK APPROACHES YOU TO AVOID A TEST BITE)



THE DECLINE OF SHARK POPULATIONS

The global population of sharks and rays has declined by **71% in the past 50 years.**

According to the IUCN, **Three quarters of oceanic species are threatened** with extinction. 37% shark species are either critically Endangered, Endangered, or Vulnerable.

Why so?

- **sharks have a very low reproduction strategy**
- **80-100 million sharks are killed annually**
- **Fins, meat, but also cartilage, and liver oil.**
- **Shark fin soup**
- **Unsustainable fishing (bycatch)**



HOW CAN YOU HELP?

- be a responsible consumer, eat sustainable seafood
- help spread the word to lower the demand for shark meat and fins
- support NGO's, sign campaigns and petitions
- Check for Squalene in your cosmetics
- Check for shark meat in your pet food
- Continue learning about sharks



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