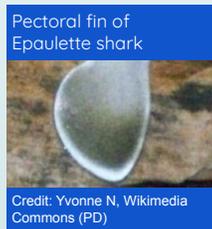
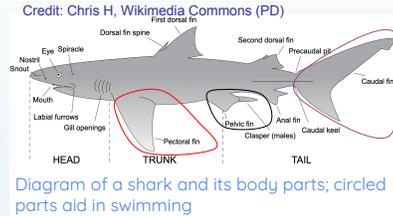


# The Evolution of Walking in Sharks

By Ryana Hamid

## Locomotion

Sharks swim around coral reefs, deep sea, and the open ocean all over the world. They move forward by moving their caudal fin, or what we refer to as their tail, side to side in a sweeping manner. Directionality is managed through the movement of the pelvic fin, which is rotated at different angles. The pectoral fins aid in lift and balance, similar in function to wings on an airplane. A big open environment is necessary as sharks swim in a straight line, avoiding making turns (JRank Articles 2022).



## Fossil Evidence

Pectoral and pelvic fins have evolved as "feet" for the shark through muscular and skeletal modifications. The pectoral fin became smaller in size and flexible, allowing for up to 90 degree angle movement. This adaptation lead to both the pectoral and pelvic fin having the same morphology and function. Having two sets of these fins function as legs that push off of surfaces. The need to come in physical contact with surfaces caused the fins to become extremely muscular (King 2011).

## Why Walk?

Some sharks have adapted to walk on surfaces instead of swimming through natural selection. The Epaulette shark is an example of a walking shark, found in the coral reefs off of Australia, Indonesia, and Papua New Guinea. The habitats are so shallow and compacted with reefs that swimming becomes rather difficult to navigate through. Speciation occurred as this type of environment was foreign to sharks. Walking along the corals was the only successful way to get into tiny spots to catch prey. Those who could navigate through various environments had a stronger rate of survival as opposed to those who could only swim (Smithsonian Ocean 2019).



## Sources of Information

King, Heather. "Behavioral Evidence for the Evolution of Walking ... ." *Behavioral Evidence for the Evolution of Walking and Bounding before Terrestriality in Sarcopterygian Fishes*, PNAS, 12 Dec. 2011, <https://www.pnas.org/doi/10.1073/pnas.1118669109>.

"Sharks - Locomotion and Buoyancy." *Locomotion And Buoyancy - Water, Oil, Caudal, and Lobe - JRank Articles*, <https://science.jrank.org/pages/6112/Sharks-Locomotion-buoyancy.html#:~:text=Sharks%20swim%20by%20moving%20their,most%20of%20the%20forward%20thrust.>

The Ocean Portal Team Reviewed by David Shiffman. "Sharks." *Smithsonian Ocean*, 16 Oct. 2019, <https://ocean.si.edu/ocean-life/sharks-rays/sharks#:~:text=They%20are%20found%20in%20just,more%20E2%80%9Cscary%2%80%9D%20to%20people.>