

# WILD OCEAN

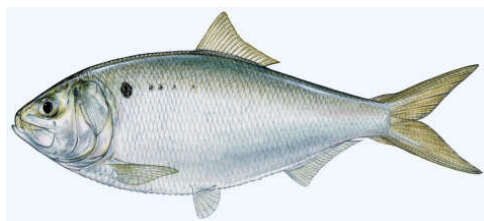
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## Species Identification Guide

The following species all play a role in the magnificent annual feeding frenzy captured in *Wild Ocean*. Each participates as predator and prey in the delicate food web of the South African oceanic ecosystem.



**Plankton** are organisms that drift in ocean waters, providing the vital nutrients needed for the food web. In many ways, these tiny organisms fuel the entire ocean ecosystem. The many varieties of Plankton are grouped into three categories: phytoplankton (plant-based), zooplankton (animal-based), and bacterioplankton (bacteria-based). The availability of Plankton depends upon the availability of light and natural nutrients within the ocean. For this reason, even the tiniest organisms of the sea can be at risk and threaten the survival of the food web.



**Mossbunker Fish**, or Menhaden, have been called the most important fish in the sea. While human beings don't eat them, they play a vital role in the complex ocean food web. These small silvery fish school in massive shoals that become the food source for a web of ocean creatures.



**Sardines** are small silvery fishes that grow very quickly to reach a length of just under 20 centimeters. Because of their small size, they group together when threatened as a natural defense mechanism. When thousands of them group together, they form a shoal and act together as a collective, constantly swimming and rearranging themselves in dazzling patterns to disorient predators. Despite their enormous difference in size, sardines have something in common with Humpback Whales: both are filter feeders. Sardines filter the water for tiny plants and animals called phytoplankton and zooplankton as the source of their nutrition. Pretty much every other creature in the sea dines on Sardines, positioning them near the bottom of the food web.



**Cape Gannets** are large seabirds that have snow-white bodies with black tails. They also have a distinctive golden crown and nape. They grow to about 90 centimeters long and weigh about 2.6 kilograms. They make their home along the seashore as they depend upon the ocean ecosystem for their survival. A gannet can travel as far as 100 kilometers over the ocean in search of food. When it sees its prey, it can dive as far as 10 meters beneath the surface. With a plummeting dive and powerful plunge, it uses its aerodynamic body to cut through the ocean at amazing speeds in search of the sardines it needs to eat in order to survive. Meanwhile, other creatures of the sea need to eat, too, and Cape Gannets can be a tasty treat, especially for Cape Fur Seals.



**Cape Fur Seals** are among the largest fur seals in the world. Fur seals are more closely related to sea lions—with their ability to walk on all fours, external ears, and a dense coat of fur on their underbelly—than they are to other seals. The Cape Fur Seal is mostly dark grey or brown in color with a lighter shade on the belly and face. Males have a mane on their necks which lightens with age over their 20 year average lifespan. An adult male can be over 2 meters long and weigh over 200 kilograms. Despite their size, they have a natural ability to hunt, diving over 200 meters below the ocean surface, holding their breath for as long as 7.5 minutes. The Cape Fur Seal's main source of nutrition comes from fish, but they will also eat seabirds like the Cape Gannet when they have the chance. Of course, sharks will eat Cape Fur Seals, especially the pups, when *they* have the chance.



**African Penguins** live in colonies on small islands along the coast. They are black and white, with individual patterns unique to each penguin. Adult males average 70 centimeters in length and 4 kilograms in weight. Their bodies are aerodynamic, helping them dive and swim very quickly in pursuit of their prey—small fish and crustaceans. That speed also helps them flee from their predators—Cape Fur Seals and sharks.



**Blacktip Sharks** are smaller than Copper Heads and Dusky Sharks but are still large and dangerous. Their skin color is dark gray-blue and their belly is white, with a thin white band along their flanks. They also have distinct black markings on the tips of their fins, although the color fades with age. Blacktips are very athletic and fast, using their speed and agility to startle their prey—which is mainly fish, although they will eat smaller sharks. And, bigger sharks will eat them!



**Copper Head Sharks** are also known as **Bronze Whalers**. They are large sharks that can grow to 3 meters in length and weigh up to 250 kilograms. The top of their body is usually a coppery bronze color, which gives them their name. Their bellies are white. They like to eat sardines and can consume 20 in one gulp! Their prey also includes other kinds of small fish, Cape Fur Seals, seabirds, turtles, squid, and even smaller sharks. Likewise, larger sharks will eat a Copper Head—until it reaches maturity. Once mature, the only predator that a Copper Head has to fear is human. This means that Copper Head Shark is an “apex predator,” occupying a dominant position in the food web.



**Dusky Sharks** are also known as **Black Whalers**. They are quite similar to the Copper Heads, growing to about the same size and occupying the same position in the food web—feeding on sardines and smaller fish and, when mature, fearing only human predators. Dusky Sharks have grayish-brown bodies and white bellies.



**Common Dolphins** are easily recognizable by their distinctive black back and a cape which forms a v-shaped saddle. They feed on small fish like Sardines and squid. They have a special ability which they use to avoid their predators—sharks and human beings. Dolphins use echolocation to navigate and locate objects in the water. The Dolphin makes a very fast clicking sound—several hundred clicks per second—to send out sound waves which bounce off of objects in its path. The Dolphin hears the “echoes” when the sound waves bounce back. The Dolphin processes the echoes into a three-dimensional image of the object, letting it know what lies ahead. This special ability helps the Common Dolphin survive in the complex ocean environment.



**Bottlenose Dolphins** are familiar to many people because of movies and television shows. It has a short rounded snout, described as bottle-shaped, and a smooth rounded head. The skin color is a series of grey tones fading into an off-white belly. Like Common Dolphins, the Bottlenose uses echolocation to find its food and also to avoid its predators. Groups of Bottlenose Dolphins will also work together to trap shoals of fish, making it easier for all of them to eat. Sometimes, a Bottlenose will use its tailfin to “whack” a fish to stun it and make it easier to eat. These behaviors have helped the Bottlenose Dolphin become a popular creature, the star of many aquatic amusement parks and aquariums.



**Humpback Whales** are magnificent creatures of the sea. Their stocky, humped, black bodies are covered with lumps called tubercles, which are actually hair follicles and are characteristic of the species. Adult females average 16 meters in length and 40,000 kilograms in weight. A Humpback can live for 50 years, if it succeeds in avoiding its predators. Once a Humpback reaches maturity, its only real predator is human. While larger sharks may attack, the adult Humpback is in only superficial danger. The shark may take a bite, but the Humpback is simply too massive. And, the shark has no reason to fear the Humpback. As filter feeders, Humpbacks use their baleen to eat only small fish, plankton, krill, and other tiny crustaceans.

Dolphins have to be conscious to breathe. This means that they cannot go into a full deep sleep, because then they would drown. Dolphins have "solved" that by letting **one half of their brain sleep by closing one eye at a time**. They sleep about 8 hours a day in this fashion.

The Dolphin respiratory system can **renew 90% of its lungs at each inhalation** (where only 15% for the human).

Whales are **well insulated** (blubber), which is good if they're in water, but not if they're beached. It's like having a winter coat in 70 degree weather- you'd overheat very quickly.

One or more **bull sharks** are most likely responsible for the Jersey Shore shark attacks of 1916 that were originally attributed to a great white, and which inspired the movie Jaws.



Bull sharks are apex predators, and **rarely have to fear being attacked** by other animals. Humans are their biggest threat. Larger sharks, such as the tiger shark and great white, may attack them. Crocodiles may also eat them if they enter their freshwater territories.

Gannets operate in huge flocks, **plunging out of the sky into the sardine shoals**. After gorging themselves, the gannets float overnight on the water in huge "rafts."

Gannets hunt fish by diving from a height **into the sea** and pursuing their prey underwater. Gannets have a number of adaptations which enable them to do this:

- they have **no external nostrils**
- they have **air sacs in their face and chest** under their skin which act like bubble-wrap, cushioning the impact with the water
- their eyes are positioned far enough forward on their face to give them **binocular vision**, allowing them to judge distances accurately



The gannet's supposed **capacity for eating large quantities of fish** has led to "gannet" becoming a disapproving description of somebody who eats excessively, similar to "glutton."

## Sea Fun Facts

Sardines live short lives, and **grow quite quickly**. They can reach a length of about 23cm in two years.

Sardines are **filter feeders**, sieving plankton from the water as it passes between their gills.

Only a small percentage of the sardine schools go through KwaZulu-Natal waters, where about 700 tons are caught annually, while **4000 tons are caught in the Eastern Cape**.

All the **sardines in tomato sauce** originate from the Cape. Some sardines are processed into fish meal.

The majority of South Africa's sardines occur off the Western and Southern Cape, where **about 100 000 tons are caught annually by vessels** operating from harbors.

An adult dusky shark was found with **621 sardines in its stomach**.

About **20 000 common dolphins** pursue the sardine run up the coast from the Eastern Cape.



**Cape fur seals and penguins also feed on sardines** but are not often seen in KwaZulu-Natal waters.



Most researchers agree that dolphins exhibit a level of **intelligence greater than that of dogs** and even comparable to that of some primates.

Dolphins can **hold their breath** for up to several minutes and are capable of rapid and **deep dives** of more than 1,000 ft.

The maximum **age for bottlenose dolphins** is between 40 and 50 years.

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## Annual Sardine Run Facts

**The Sardine Run** is a natural phenomenon where millions of sardines migrate north from the cold southern oceans off South Africa's Cape Point, along the east coast of South Africa to mass in large shoals in the waters of KwaZulu - Natal.

The Sardine Run takes place annually along the shores of the northern Eastern Cape and southern KwaZulu-Natal coastlines of South Africa between the months of May and July.



It is believed that the penetration of cool water eastwards along the eastern cape and a cool northerly flowing current during the winter months extends the suitable habitat for the Sardines and the plankton they feed on triggering this mass migration.

Sardines are typically found in waters between 14 to 20 C. If the inshore water exceeds 20 C, the Sardines will stay in the cooler water further south or move further offshore where the water is cooler. Therefore rising sea temperatures due to climate change have sometimes deterred them from journeying northward along the African coast.



It is estimated that only 2% of the holding stock of Sardines based off the southern Cape coast make the journey but these phenomenal shoals can be as long as 15 km and 4 km wide on their 1000 km journey along South Africa's Wild Coast.

The configuration of the coastline together with the cool south to north counter current that develops against the warm Agulhas current at this time of the year is thought to encourage the Sardines journey close to the shoreline.

## **South African Sardines**

The sardines that make their way up the Wild Coast are part of the *Sardinops Sagax* family, a species that can also be found in the deep waters off Japan, Australia, and California. They are small silvery fishes with a single dorsal fin located over the middle of the body, a forked caudal fin and a keel of large spiny scales along the belly

Research on the differences between the African sardine and those in North America or the Mediterranean is ongoing but there do seem to be variations in gill sizes and number of vertebrae.

**Size:** They grow rapidly to reach a length of just under 20cm.

**Average Lifespan:** Three years

**Migration:** The South African sardine spawns in the Alguhas banks off the southern Cape coast; their eggs are then carried by benign ocean currents westwards and northwards into the productive waters along the west coast. Once hatched and grown strong enough to swim against the current they return back to their spawning ground in the south.

**Benefits of swimming in a shoal:** Sardines group together when they are threatened. This instinctual behavior is a defense mechanism as an individual has more chance of being picked off by a predator than when surrounded in a shoal. These shoals operate as a larger organism; constantly morphing, rearranging and reflecting light in dazzling patterns to disorientate predators.

**Diet:** Sardines are filter feeders and rely on minute aquatic plants called phytoplankton and other minute free floating aquatic animals called zooplankton for food.

**Ideal water temperature:** Range of 14 to 20 C/ 57 to 68 F

**Breeding:** Spawning takes place in the spring and summer months on the Agulhas Banks off the southern Cape Coast.

**Predators:** The Sardines fall prey to pods of dolphin: Common and Bottlenose; sharks: Bronze Whaler, Copper, Spinner, Dusky, Bull, Ragged-tooth, Tiger, Hammerhead, Black Tipped and Great whites; Cape Fur Seals; game fish including Shad, Garrick and Geelbek; sea birds including Cape Gannets and Cormorants, and even the occasional Penguin, Albatross or Orca that have followed the Sardines from southern waters.

**Position in the food chain:** The tasty Sardine sits at no 2 in the food chain, above only the plankton that they feed on.

**Population:** The sardine *Sardinops sagax* population in the southern Benguela has undergone substantial fluctuations in size over the past 50 years, collapsing from an apparently large population in the 1950s to low levels in the mid-1960s, remaining low for the next two decades, and recovering from the late 1980s to a population size that is now similar to or larger than that which occurred during the 1950s.