

Humpback Whales

Before we discuss this whale in more detail, it makes good sense to see to which family it belongs.

Family Balaenopteridae / Rorquals

This family of whales, the Rorquals, gets their name from the longitudinal folds of skin that run from below the mouth to the naval. None of the other groups of cetaceans have this. This allows the mouth and the throat to extend greatly during feeding thus increasing the capacity of prey taken in during a single gulp. The word Rorqual comes from the Norwegian meaning “furrow whale”. They all use a unique hunting technique called “lunge feeding”, although some of them can also use skim feeding. The lunge feeding is usually associated with fish that have been corralled into a “bait ball”. They then use their baleen plates to sieve plankton and fish from the water.

It is thought that they use low frequency sound waves to locate their prey unlike the toothed whales that use high frequency echo location. When they get closer they rely on pressure sensitive hairs (located in the tubercles in Humpback whales) to guide them in at close quarters. They lunge forward at their prey, opening their mouths at almost right angles and just at the right time. The two bones in the lower jaw (which in the case of the blue whale is the largest bone to ever have existed) are connected to the skull by flexible joints. As they are not fused together like most animals, they can swing outwards making the mouth even bigger. In this one coordinated move the whale can take in more prey and water than its mass!

Besides the big mouth trick, the rorqual pleats below the throat also expand, making even more room. The massive tongue retreats through the floor of the mouth to complete this process. This all happens in a split second as anyone would know who has tried to photograph a Bryde’s whale doing just this! In the blink of an eye the whale’s shape changes from thick salami into an inverted pair! Once filled to capacity, the whale closes its mouth, contracts the pleats and lets the tongue go back to its normal position. This forces the water out through the baleen plates leaving the food behind. What an amazing evolutionary adaption and advance from the teeth with which they started. They have now become the largest animals on the planet that eat some of the smallest organisms.

New Organ discovered

During 2012, scientists discovered an organ in rorquals that had never been noticed before. It was the size of a football. It was situated between the tips of the two lower jawbones and rested on cartilage. It is thought to coordinate lunge feeding. The organ is covered in a jelly like substance and is rich in blood vessels and nerve endings. These originate from a tooth socket located on one of the jaws. As rorquals do not have teeth, but baleen plates that evolved from teeth, this organ must have evolved along with baleen. During lunge feeding this organ picks up signals from the jawbones that pivot outwards. It also gets signals from the cartilage on which it rests as the mouth opens. It must then surely send a message to the throat grooves to expand to make space for the prey and water that is on its way. When full the

whale closes its mouth and repeats the process in reverse. The pleats are contracted and the tongue goes back to its original position, forcing the water out through the baleen plates while the food remains behind.

Humpback whale, *Megaptera novaeanglia*

This whale gets its common name from the way in which it arches its back prior to a deep dive. The Latin name means the “big wings of New England” which is on the Eastern seaboard of North America where this whale was first described by whalers. These extremely long pectoral fins with a white underside are the largest appendage in the animal kingdom. They could be used effectively for thermoregulation, maneuvering around prey or as a defense against killer whales. These whales can be easily recognized by the distinctive shape of their dorsal fin which is located two thirds of the way back from the rostrum. It has an extended leading edge and a smaller trailing one. The shapes vary greatly between whales and this allows scientists to easily identify individuals. The tail fluke is scalloped at the rear and has distinct white markings on the underside which likewise can be used to identify individuals. The fluke is often flicked into the air after a few breaths and indicates a deep dive. The head, chin and mandibles are covered in over 80 raised tubercles, which each contain a single hair which acts as an aid during feeding. They are also host to *Coronula* barnacles which are mostly found on the chin and the tips of the flukes. On sick or stressed animals they can be found on most dorsal parts of the body.

Why do these whales migrate?

During the peak of the Southern Hemisphere summer, it is permanently light. When the salt water freezes as fresh water, many nutrients are given out to the surrounding water. This water is only 2 degrees Celsius and thus contains a great amount of dissolved gases like Carbon Dioxide and Oxygen. The combination of these three factors promotes the growth of phytoplankton (plant plankton). This in turn feeds massive shoals of zooplankton (animal plankton), including krill and copepods. This is what the whales eat and can double in size in one season. The pregnant females cannot give birth in the Antarctic, as the water is too cold. Hence they need to migrate to the warm tropical waters off West and East Africa. Similarly, the males need to mate with receptive females here, as the gestation period is 12 months and they need to be back here the following year. The females feed their calves a few hundred litres of nutritious milk every day in order to get them strong enough for the return journey to their feeding grounds. The immature of both sexes also travel to the African continent, but do not make the entire migration as they have no reason to. Staying in a dark and cold Antarctic is not very appealing, so if they can forage opportunistically anywhere on the African coast they will do so. This is especially evident in the super pods that feed in their hundreds on krill along our West Coast.

These whales have recorded the longest migration of any mammal. From their summer feeding grounds which start around 60 degrees South to Algoa Bay is around 4 500 km, which means they still have another 6 500 km to go if they make it all the way to Kenya which some individuals do. The Northern migration seems to reach Knysna in April and pass Algoa Bay at the beginning of June, although in some years we do see some lone individuals in late April and early May. This movement between the breeding and feeding grounds tends to be quite structured and takes a month for the different groups to leave.

The first are the females which have recently weaned their calves. They are followed by the immature of both sexes. Next up are the testosterone enriched males, in groups of between four and ten individuals. Encounters with these male pods are a frightening affair! Next to pass are the resting females followed by the pregnant females who have been cramming in the last morsel of food to get their fat reserves up to maximum capacity. They will need this for the journey, childbirth, nursing and the incredible journey back.

Calves are not only born on the breeding grounds. We often encounter newborn calves off Algoa Bay while they keep on heading further north. Why would a cow give birth and then still swim all the way north with a calf expending all that extra energy when not necessary? Calves are 4 metres long at birth and can weigh up to two tons.

Up to 2016 we used to see them on their Southern migration coming past Algoa Bay up until the second week in January. This has changed in recent years and the bulk of them have come past by the end of November. Is it possible that global warming has changed the environment and possibly the prey distribution and seasonality? The return migration is structured differently but also takes a month between the first and last departures. The pregnant and resting females are the first to leave. They are followed by the immature of both sexes and the mature males. The cow calf pairs are the last to leave take their time meandering down the coast getting the calf in shape for the long and tiring journey once they leave the African coastline. They will face many dangers en route like marauding killer whales which will separate the pair, drown the calf and then only eat the tongue. There is also the ever present danger of a ship strike or entanglement in fishing gear.

They have a very diverse diet for a baleen whale and include many shoaling fish species, krill and other euphausiids, amphipods and stomatopods. Although bubble netting and cooperative feeding has been observed in humpback populations in the Northern hemisphere, it has not been observed in the Southern hemisphere populations. Generally they do not feed while migrating along our east coast. My son Jamie did however once observe them feeding just off Kings Beach in Algoa Bay. He phoned me while observing it and I asked him to check the depth on the echo sounder. He said it showed no depth at all which was because the sea was alive with bait fish under the boat!

These animals were hunted to the brink of extinction between 1908 and 1963 with 210 00 animals being taken, mainly from the Durban and Donkergat (Saldhana) whaling stations. They have bounced right back and are presently approaching their pre exploitation numbers. Is it not incredible that just because of a human paradigm shift that these animals should be protected, has led to such a remarkable recovery? This recovery has been aided by the fact that females can fall pregnant shortly after giving birth, although the usual calving interval is every two years. An estimated 7000 of them pass Algoa Bay en route to their mating and calving grounds off East Africa.

They are the most acrobatic of our whales and we have often observed them breaching at least 20 times in a row. They leave the water vertically and twist as they reach the zenith of their breach reentering the water on their backs. There is nothing quite as exhilarating, or scary, than watching a 15 metre 40 ton animal breaching close to our whale watching boats.

