

## **Oceanic Nekton Part Two: The Tetrapods COVID VERSION**

### **Nekton**

- Nekton are organisms capable of sustained locomotion against the water motion. This group includes fish, mammals, reptiles and birds. Tetrapods, or tetrapoda, means “four-legged” and include animals that have, or evolved from creatures that had, four appendages.

### **Marine Reptiles**

- All marine reptiles (class Reptilia) evolved on land and have since returned to the sea. They include one species of crocodile (giant saltwater crocodile), one species of lizard (marine iguana), sea snakes and sea turtles.

### **Seabirds**

- Birds (class Aves) play many roles in marine ecosystems. Many species feed and breed in coastal environments. However, the penguins (order Sphenisciformes) are by far the most adapted to the sea, spending up to 75% of their time under water. They eat krill, squid and small fish as an important link in the Antarctic food web.

### **Pinnipeds**

- Pinnipeds, in the order Pinnipedia, include seals, sea lions and walruses, although some argue that they are in fact part of the order Carnivora (which includes bears and cats).

### **Cetaceans**

- Whales, dolphins, and porpoises are classified under the order Cetacea, which is further divided into two suborders: Mysticetes and Odontocetes. Mysticeti (baleen whales) have baleen, a brush-like fringe that they have in place of teeth to feed on plankton, particularly krill. Odontoceti (toothed whales) prey on larger organisms.

### **Adaptations: Buoyancy**

- Tetrapods have different methods of buoyancy than fish.
  - Fat can be controlled seasonally
  - Replacement of heavy ions with lighter ones
  - Gas spaces within the body

### **Adaptations: Locomotion**

- Tetrapods use two basic methods of locomotion.
  - Appendicular swimmers, such as turtles, birds, and pinnipeds typically have short body, short tail, long neck, small head, and hind limbs that are webbed or paddle-like.
  - Undulatory swimmers, such as marine iguanas, sea snakes, and cetaceans typically have more fishlike bodies with well-developed tails and hindlimbs that are reduced or absent.

### **Sensory Systems**

- Most sensory information by nekton are similar to land animals. There are, however, some additional senses:
  - Marine mammals have a geomagnetic sensory system which plays an important role in long-distance navigation.
  - Marine mammals also have the ability of echolocation, in which sound waves are sent out and the reflected/refracted waves are received and analyzed to determine distance and density.

### **Reproductive Generalizations**

- Marine birds and reptiles retain the reproductive characteristics of their terrestrial relatives producing eggs on land, while whales give birth in the water and pinnipeds give birth on land.

## Marine Organisms of the Day

**1. Elephant Seal (*Mirounga angustirostris* and *Mirounga leonine*):** The northern elephant seal and the southern elephant seal were both hunted to the brink of extinction at the end of the 19th century, but the populations have recovered. The large trunk that gives them their name is called a proboscis, which is used by the male to produce loud roaring noises, especially during mating season.

<https://www.youtube.com/watch?v=IpT1u2IFkXs> (3:43)

**2. Hawksbill Sea Turtle (*Eretmochelys imbricate*):** The Hawksbill Sea Turtle is critically endangered. They can grow up to be about 45 inches long (shell length) and 150 pounds, which is relatively small for a sea turtle. Their shells are strikingly colored and they are often harvested illegally for their shells and meat.

<https://www.youtube.com/watch?v=uCbeFLizHuM> (0:50)

**3. Killer Whale aka Orca (*Orcinus orca*):** Orcas hunt in pods of up to 40 individual whales, which can be deadly for their prey. They have extremely sophisticated echolocation systems where they emit clicks, then listen for the echo. It is the largest member of the dolphin family and was given the name "killer whale" by ancient sailors that observed groups of orcas preying on whales. The species is found worldwide, but orca populations are localized.

<https://www.youtube.com/watch?v=-DANuOqoLAE> (0:46)

**4. Blue Whale (*Balaenoptera musculus*):** The Blue Whale is the largest creature ever to have lived on the planet. It can reach almost 100 feet long and 400,000 pounds. The heart alone can weigh 400 pounds. A blue whale calf can drink 100 gallons of milk per day in order to gain 200 pounds every 24 hours.

<http://www.bbc.com/earth/story/20150820-see-the-worlds-biggest-heart-blue-whales-is-first-to-be-preserved> (1:34)

**5. Common Bottlenose Dolphin (*Tursiops truncatus*):** The Common Bottlenose Dolphin is what you typically think of when you think of a dolphin. They are the most common species found in captivity, and were featured in the TV show, *Flipper*.

[https://www.youtube.com/watch?v=VjMn\\_dVCJyA](https://www.youtube.com/watch?v=VjMn_dVCJyA) (1:15)

**6. Emperor Penguin (*Aptenodytes forsteri*):** The Emperor Penguin is the largest of the penguin species, reaching four feet tall and almost 100 pounds. They eat primarily fish in their Antarctic home. This is the species featured in the film *March of the Penguins*.

<https://www.youtube.com/watch?v=L7tWNwhSocE> (2:25)

**7. Narwhal (*Monodon monoceros*):** The Narwhal is known as the Unicorn of the Sea for its tusk, which is actually a tooth that grows out through the upper lip of the male (only a small percentage of females have it). The scientific name actually means "one horn, one tooth". The tusk is a sensory organ, and not used for fighting or feeding.

<https://www.youtube.com/watch?v=YO58kt-jETA> (2:13)

## Finding Nemo Clips for This Exam

17 – News Travels

9 – Dory Speaks Whale

21 – Inside the Whale