



Migration

3.7 Migration

A migration is the long-term movement of an animal from one place to another. Migrations are more than just the routine movement of an animal around an area. The marine environment has three dimensions so migration can be:

- **horizontal migration** to different geographical regions
- or **vertical migration**, which means moving up and down in the ocean.

Migrations are often seasonal, such as the movement of tiger sharks. These sharks spend the winter feeding around the Caribbean islands before moving to the Mid-Atlantic Ocean in summer to feed on immature loggerhead turtles. The migration of the tiger sharks is over a long distance.

Migrations can also be daily and over a shorter distance. For example, many organisms move up to the surface waters at night before sinking back down to the deep, dark waters during the day.

Reasons for migration

Animals do not decide to move from one area to another. Migration behaviours are responses that have evolved over thousands of years because they help organisms to survive. Here are the main reasons that animals migrate.

- **Finding food:** many species will migrate because food is **seasonal**. When Antarctic ice melts in the summer, algae that were trapped in the ice are released. Small crustaceans called krill eat the algae. The krill **population** therefore increases rapidly. Blue whales eat krill, so blue whales migrate every year from more northerly latitudes to the Antarctic waters to feast on the krill.
- **Finding mates:** due to the large sizes of the oceans, it can often be difficult for species to find mates. When European eels reach sexual maturity they migrate to the Sargasso Sea, an area of the western Atlantic Ocean, where they mate. They make this journey once in their life and die after mating. The young eels that are produced drift on sea currents back to the European waters. Grouping together in the same area makes it easier for eels to find a mate and increases the **genetic diversity** of the eel population.
- **Spawning in a different habitat:** Pacific salmon are spawned in rivers and streams. After hatching, the young salmon live and feed in these rivers for several years until they are old enough to migrate into the Pacific Ocean. Here, they grow and reach sexual maturity before migrating back to the river where they were spawned to breed.
- **Avoiding predators:** many animals live in the depths of the ocean during the day, where they are hidden from predators due to the lack of light. Every evening, these animals move upwards to the surface waters. At night they can feed in surface waters as their predators cannot see to hunt in the dark.

Horizontal migrations

Many species of animal migrate from one geographical area to another, and an example is the migration of blue whales in search of Antarctic krill. These geographical migrations are also called horizontal migrations.

Horizontal migrations are often seasonal and are important for breeding or to obtain food during different times of year. We will look at examples of horizontal migration in tuna, turtles and whales.

Whales

Many species of whale migrate to seasonal feeding grounds or to join up to breed. Research on humpback whales, usually using satellite tracking, shows that populations of humpback whales make massive annual migrations. Figure 3.49 shows the migration route of one population that spends the winter in coastal waters of the Pacific Ocean near Peru, Ecuador, and even goes as far north as Costa Rica. The whales migrate south during the spring to reach Antarctic waters in the summer where the melting ice causes a rapid increase in their food. As the ice melts, it releases microalgae which are food for crustaceans called krill. It is krill that are a major food source for the whales. The microalgae population increases rapidly as the ice melts. The krill population also increases, which provides rich feeding for the whales. During the summer, the whales build up the fat stores that are needed for their journey back to the winter breeding grounds. Their journey can be over 7000 km in length.



Research shows that many shark and whale species develop mental maps of migration routes. These mental maps build up over time as the animals learn the locations of landmarks. Mental maps can include structures made by humans, such as **buoys** and oil rigs. The learning of landmarks may be particularly important for whales that live in groups called pods. The young whales are 'taught' the migration routes by the older members of the pod and develop their own mental maps. This can make it difficult to take whales that have been bred in captivity and reintroduce them to the oceans, as they will not have learnt a migration path.

1 Fig. 1.1 shows migration routes of humpback whales.

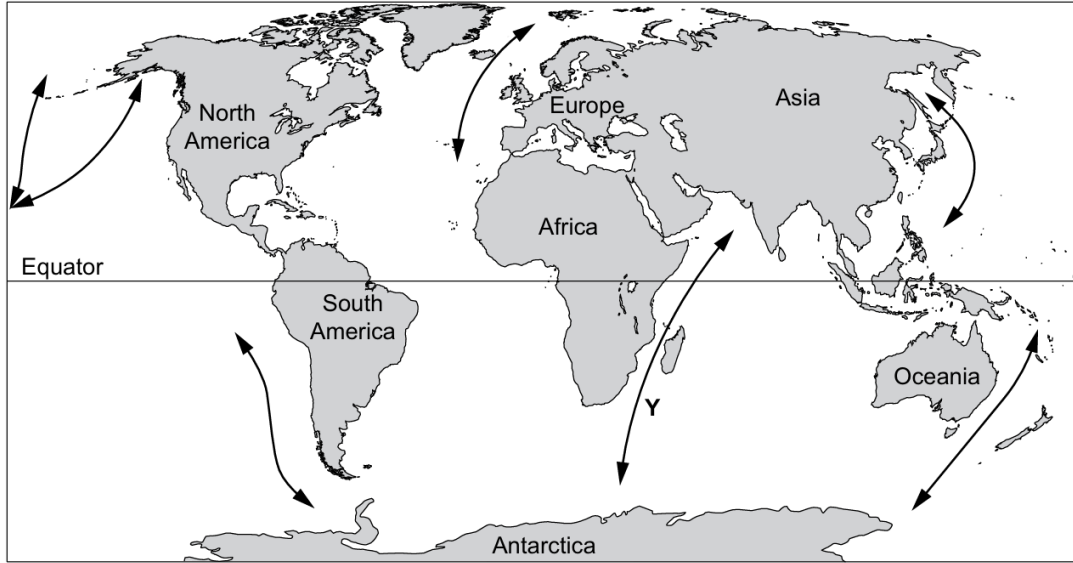


Fig. 1.1

(a) (i) Migration route Y represents the movement of one whale.
State the names of the **two** oceans between which this whale migrates.

- 1
- 2 [2]

(ii) State **two** reasons why whales migrate.

- 1
- 2 [2]

(iii) State **two** methods the whale may use to find its way when migrating.

- 1
- 2 [2]

(b) A whale dives through the pelagic zone to a depth of 2000 m.

(i) State the names of the **three** zones the whale dives through.

- 1
- 2
- 3 [3]

(ii) Describe the changes in temperature and light as the whale dives to 2000 m.

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[Total: 13]