MIGRATION IN MARINE ANIMALS

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Migration in marine animals

Many marine species that migrates between different waters in search of food, to reproduce, or to avoid predators is a marine species. While some move across the water column, others migrate vast distances. Long-distance ocean travelers are known as highly migratory marine species. They swim thousands of kilometers, spanning continents and even international borders. These intriguing migrations affect all species, including fish, sea animals, reptiles, and seabirds.

Migration in Fishes

Many fishes migrate on regular basis, on a time scale ranging from daily to annually or longer. It may be of short distance over a few meters to thousands of kilometers.

Significance of Migration in Fishes:

1. For suitable feeding and spawning places
2. For protection from predators
3. For increasing genetic diversity
4. An adaptation in character to survive from extreme climatic conditions.

Classification of Migration:

1. **Diadromous:** across sea water and freshwater

    A. Anadromous: from sea water to fresh water (marine fishes)
    B. Catadromous: from fresh water to sea water for breeding (fresh water fishes)
    C. Amphidromous: from fresh water to sea water not for breeding

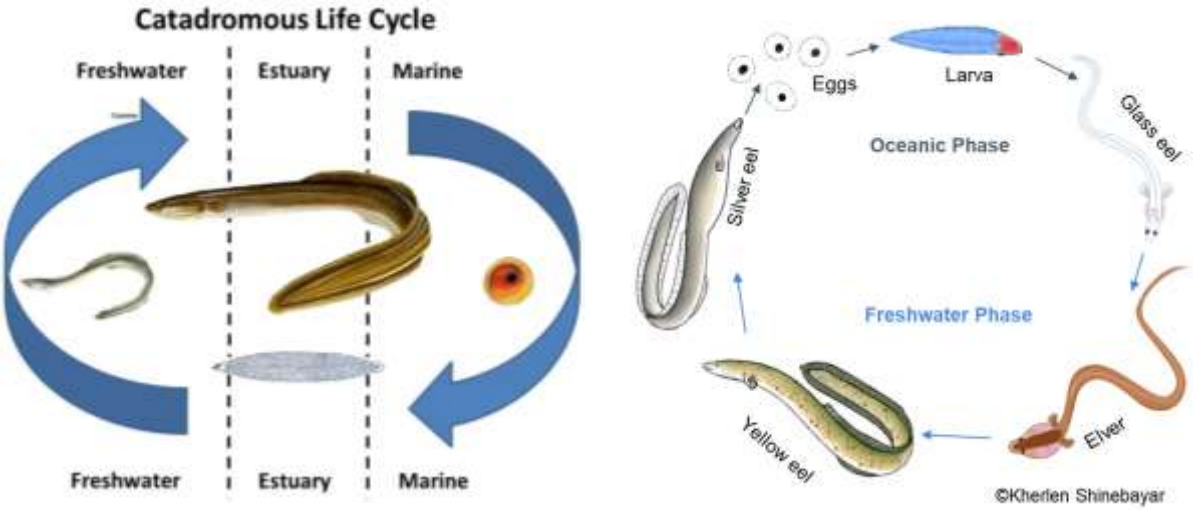
2. **Oceanodromuos :** within sea water
3. **Potamodromous :** within fresh water

1.1. Diadromous migration

when fishes migrate from fresh water to sea or from sea to fresh water.

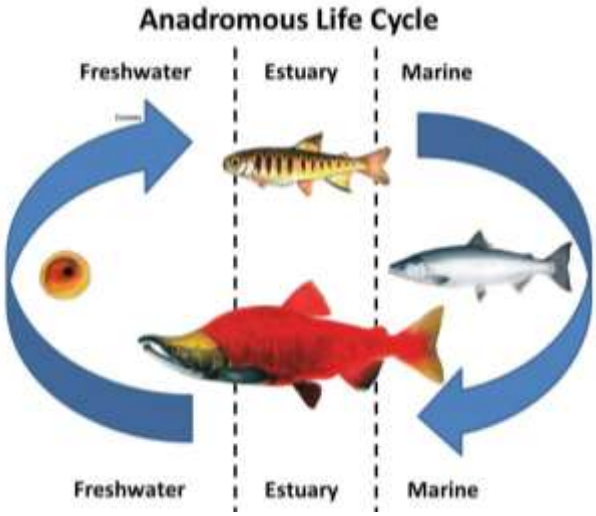
- **Catadromous migration**

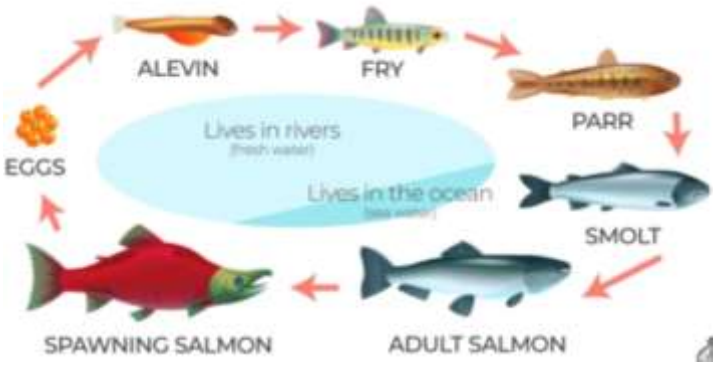
- fish species that migrate from fresh water down into the sea to spawn, such as eels.
- Catadromous fish species spend most of their lives in freshwater, but they migrate to the sea for the purpose of breeding.
- The best examples of catadromous fish are eels of the genus Anguilla.



- **Anadromous**

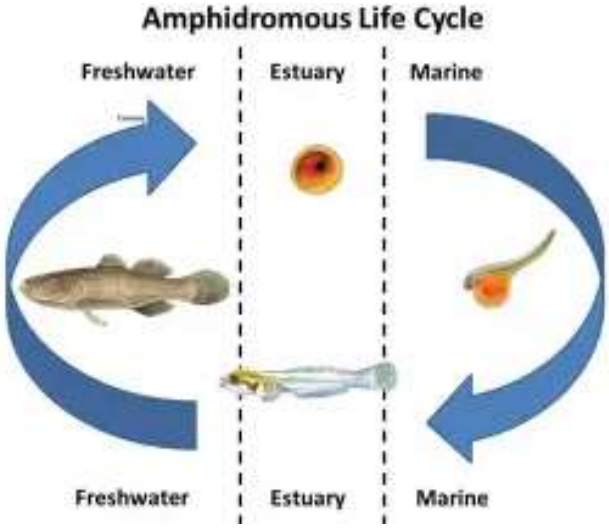
- Fish species that migrate from the sea up into freshwater to spawn, such as salmon, striped bass, and the sea lamprey.
- Salmon (Salmo, Oncorhynchus) spawn in lakes or higher streams where the water is cool and clean.
- Salmon have long been appreciated for their long, difficult migrations up rivers to their spawning sites, as well as the extraordinary homing skill that permits them to do so. Their ability to locate back to suitable mating grounds is particularly impressive, given that migration often follows a lengthy stay at sea, which can last up to five years.





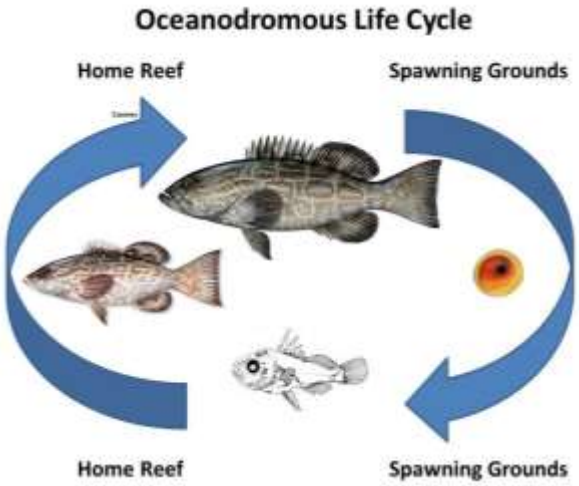
- **Amphidromous**

- fishes that regularly migrate between freshwater and the sea (in both directions), but not for the purpose of breeding.
- Unlike anadromous and catadromous fish, which migrate explicitly for the purposes of breeding, amphidromous fish migrate for other purposes. A typical cycle of amphidromy includes eggs hatching in freshwater or estuaries, larvae drifting out into the open ocean to feed and grow, juveniles returning to freshwater to feed and grow, and adults reproducing in freshwater.
- Gobies, such as those found on volcanic islands in the Pacific, exhibit an amphidromous life cycle.



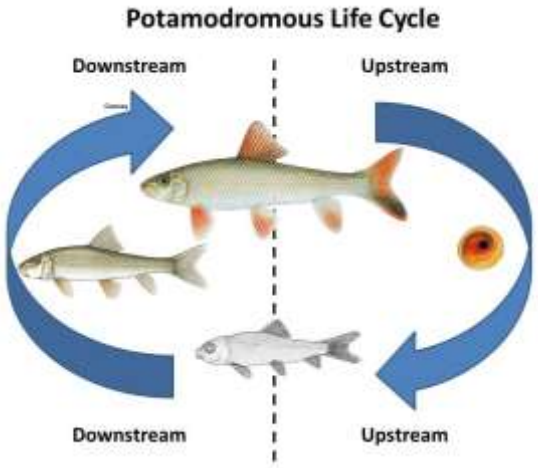
1.2.Oceanodromous

- fish that live and migrate wholly in the sea. These occur widely throughout the world's ocean.
- Oceanodromous fish are born near spawning grounds, then drift on ocean currents as larvae before settling as juveniles to grow into adults before migrating back to spawning grounds.
- Examples: black grouper, mutton snapper, goliath grouper, Herring (*Clupea harengus*), Cod (*Gadus morhua*), Tuna



1.3.potamodromous:

- fish whose migrations **occur wholly within freshwater**.
- Potamodromous fish are born in upstream freshwater habitats, then migrate downstream (still in freshwater) as juveniles to grow into adults before migrating back upstream to spawn.
- Examples: sicklefin redhorse, lake sturgeon, robust redhorse, flathead catfish, Carps



Migration in sea turtles

- Most sea turtles migrate between foraging and nesting grounds,and seasonally to warmer waters.often these migrations take them hundreds and even thousands of miles.
- leatherback sea turtles are among the most highly migratory animals on the earth,traveling as many as 10000 miles.
- sea turtles will move north during spring and summer seasons to more nutrient rich bodies of water. In fall and winter seasons, they will migrate back in a southward direction.
- sea turtles nest in tropical and subtropical regions around the globe. Both males and females will migrate to nesting areas to breed, generally in the area where were born.

whales' migration

- Whales make one of the longest animal migrations known to man, and they do it without fail every single year
- They start their swim north around May and June, and then start making their southbound journey from around August to November. The peak of the season is the around end of June and throughout July

So why are they doing this?

- Food and reproduction are the main reasons whales migrate, and fortunately, because they migrate in such a cyclical pattern.
- Whales need to survive the very cold Southern Ocean by developing a thick layer of fat to keep them warm. They build up this fat from their food.

- However, newborn whales don't have this thick layer and would not survive if born in the Antarctic. They need warmer water while they build up their insulation layer with the nourishment they get from their mother's very rich milk.
- The whales start their swim north to find warmer waters in which to breed, and then start making their southbound journey with newborns in tow. And they tend to migrate towards cooler waters during the warmer summer months in order to stock up on food and replenish their supply of blubber.

Zooplankton migration

- When we use the word zooplankton, we are really referring to a hugely diverse group of animals. They can vary in size from less than a millimeter long to much larger examples, such as jellyfish and fish larvae.
- Zooplankton are bite-sized, energy-rich snacks for many predators, such as fish, whales, and seabirds. These predators are fast and use their eyes to detect their food, which means that they are most effective at hunting during the day and in the sunlit surface water. However, the zooplankton's food source, tiny plants known as phytoplankton, are also only found in the surface water.

So they tend to survive either through:

- **ontogenetic vertical migration (OVM)**
- **diel vertical migration (DVM)**
- **seasonal vertical migration**

Diel vertical migration:

- Diel means that it occurs on a daily, 24-h cycle. Vertical refers to the direction of the movement up and down in the water column, Zooplankton want to feed , but they also want to avoid the surface during daylight. As a result, they have finely tuned their migrations to the timing of sunrise and sunset.

Seasonal Migration

- Seasonal migration is whereby zooplanktons are found at different water depths depending on whether it is winter

Ontogenetic Migration

- it does not depend on daily or seasonal patterns.
- Ontogenetic migration occurs during different life cycles of organisms whereby they live in different depths during particular cycles
- for example Bull trout express daily and seasonal vertical migrations with smaller individuals always staying at