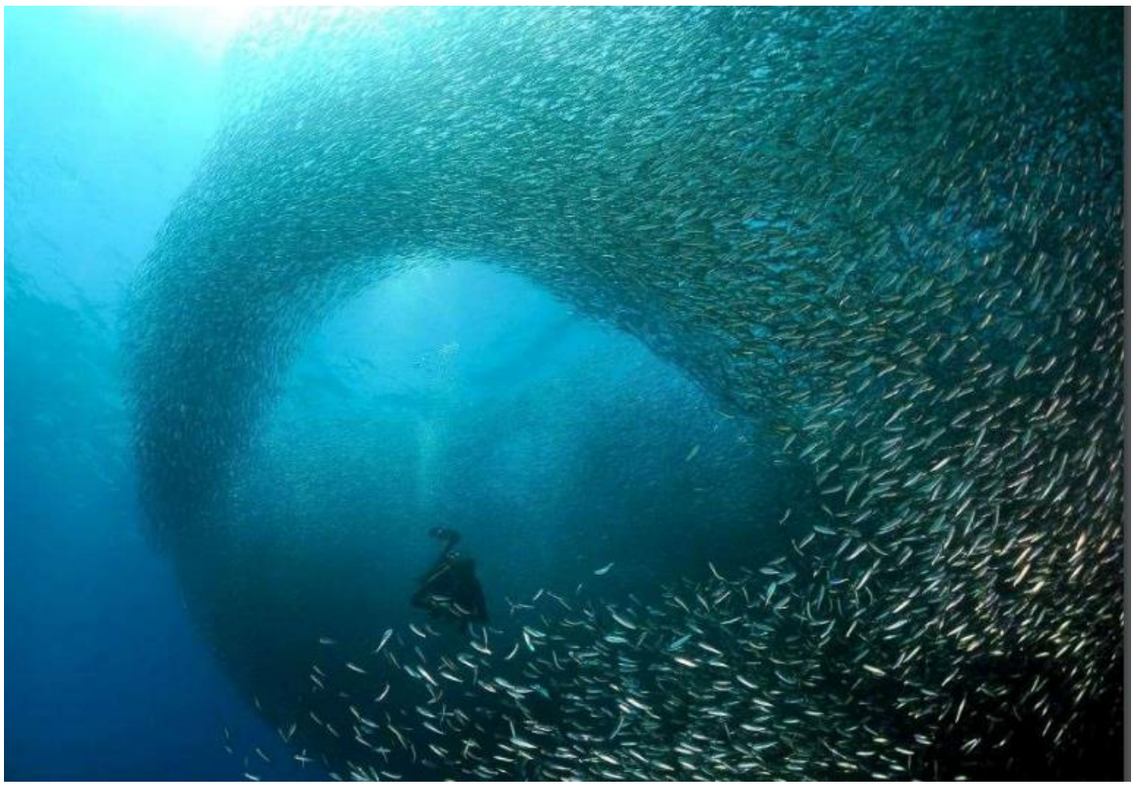
MIGRATION IN FISHES



Migration involves movement of animals on a larger scale and duration for a particular reason. The purposes for migration vary accordingly with the types of animals. In fishes various types of migratory movements are seen on a regular basis, on a particular time scale ranging from daily to annually or longer, and over a distance ranging from few meters to thousands of kilometres. Migratory behaviour of fish is a regular phenomenon. Their journey is purposed mainly for feeding and reproduction. In ecology, it is an animal behaviour of mass movement of animals from one place to another.

- ✓ **Shoaling:** When large no. of fishes come together and moves socially, it is called as shoaling. Example: *Tuna*, *Anchovies*.
- ✓ **Schooling:** Migrating fishes exhibit high degree of coordination in their movements and carry out synchronized manoeuvres to produce different types of shapes. This is called schooling.eg. Forage fishes

Types of fish migration on the basis of needs:

1. **Alimentary or Feeding migration:** migration for search of feeding ground. It occurs when food resources get exhausted.
2. **Gametic or spwaning migration:** it occurs during breeding season in search for the suitable spawning ground.
3. **Climatic or seasonal migration:** migration in search for suitable climatic condition.
4. **Osmo-regulatory migration**: migration for water and electrolytes balance from sea to fresh water and vice-versa.
5. **Juvenile migration:** it is larval migration from spawning ground to the feeding habitats of their parent.

Movement of fishes during the migration:

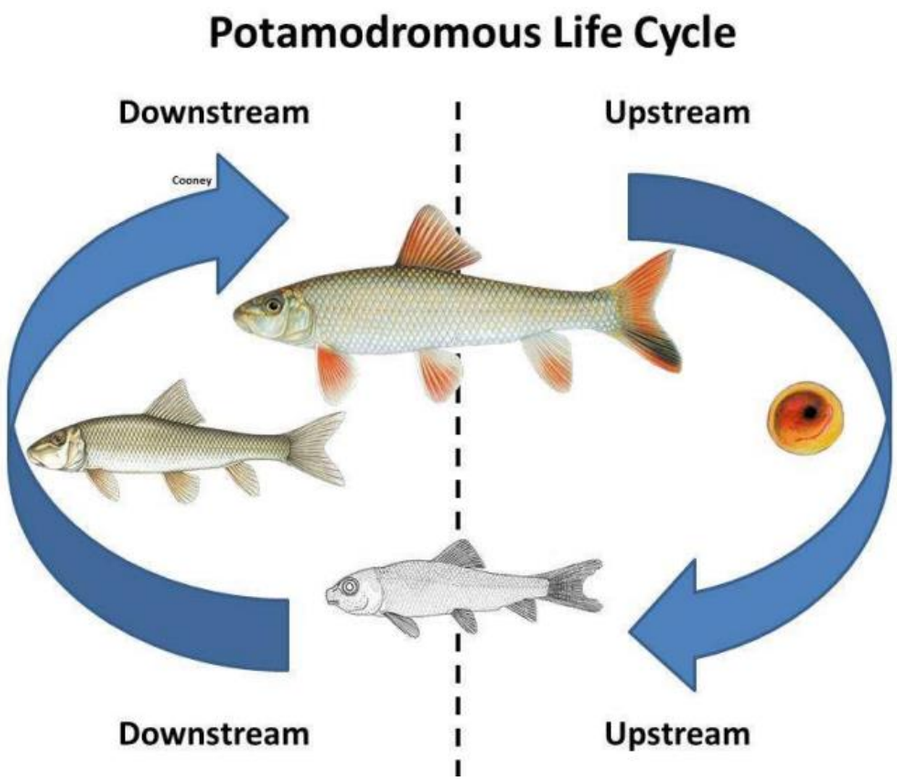
1. **Drifting movement:** It is a passive movement of fish along with water currents.
2. **Dispersal movement:** It is a random locomotory movement of fish from a uniform habitat to diverse direction.
3. **Swimming movement:** It is an orientated movement of fish either toward or away from the source of stimulus.
4. **Denatant and Contranatant movement:** It is an active swimming movement. Denatant movement is swimming with the water current while contranatant movement is swimming against water current.

Types of fish migration:

The migration of some fishes is a regular journey and is truly an innate animal behaviour. Fish migrations are classified into following types:

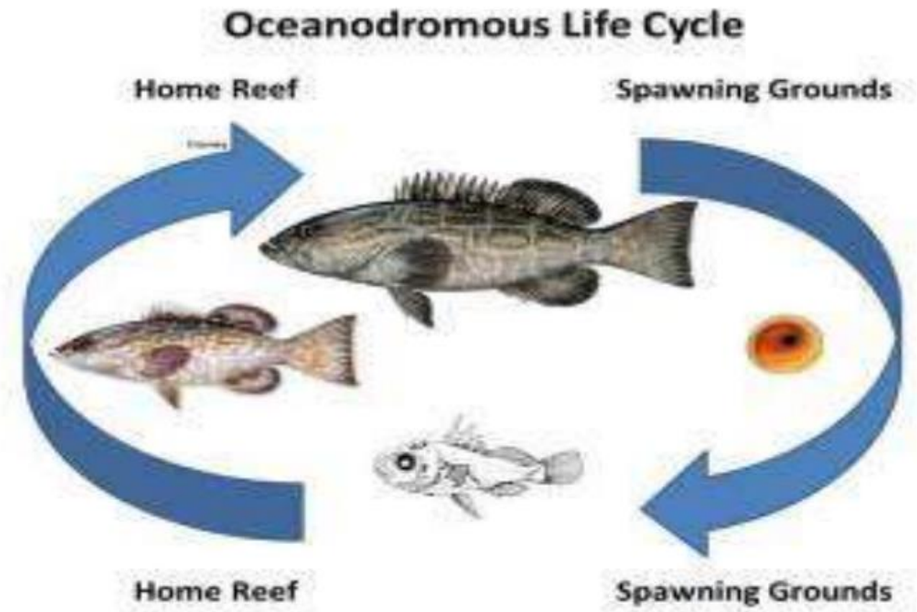
Potamodromous Migration:

- When fishes migrate from one freshwater habitat to another in search of food or spawning, it is called as potamodromous migration.
- This migration is limited to freshwaters only.
- Fishes also migrate to lay eggs in places where oxygen concentration in water is more and where there is abundance of food for juveniles when they hatch from eggs.
- Example: Common Asian Carps, catfish.



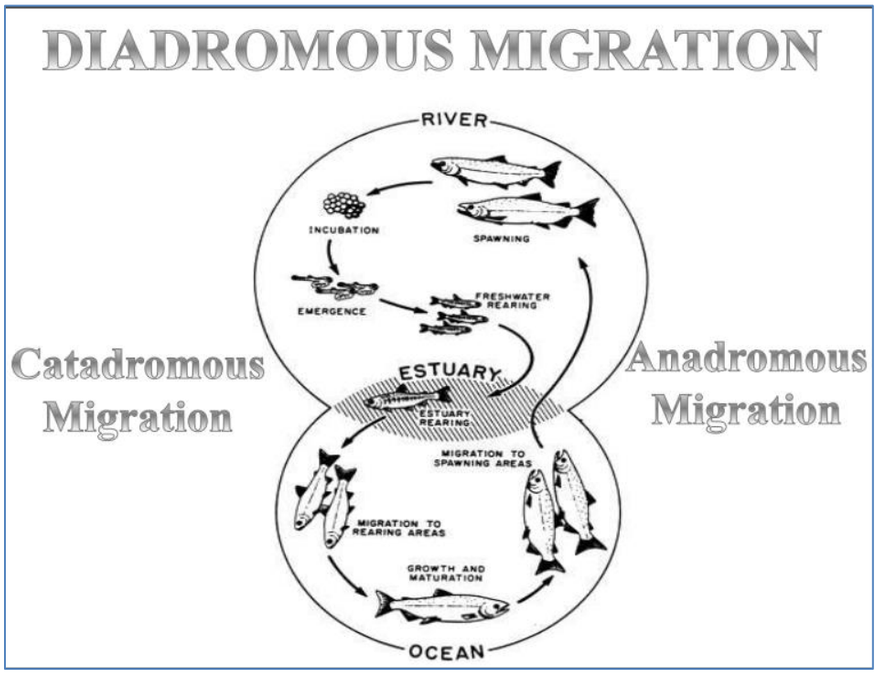
Oceanodromous Migration:

- This migration is from sea water to sea water.
- Example: There are about 12,000 marine species that regularly migrate within sea like herrings, sardines, mackerels, cods, roaches and tunas.



Diadromous migration:

- When fishes can migrate from fresh water to sea water or from sea water to fresh water, it is called diadromous migration.
- It involves 120 species of fishes that are capable of overcoming osmotic barriers and migrate in these habitats.
- This migration is of two types:



1. **Anadromous migration:**
   - It is the migration of marine fishes from sea to fresh water for spawning.
   - Fishes spend most of their life living and feeding in sea.
   - They only migrate during breeding season to the river for spawning ground.
   - Example: *Salmon, Hisla, Lamprey* etc.
   - Salmon migrate for breeding during winter from sea to river. While migrating, some physiological changes occur:

     – Stops feeding during journey

     – Changes colour from silver to dull reddish brown

– Gonads mature

- They select suitable spawning ground and make a saucer-like nest in which female lays eggs and male releases smelt over them.
- Juvenile larva hatched out from the egg known as Alevins. Alveins then transform into parr and metamorphosed into adult when return to the sea.

2. Catadronous migration:

- It is the migration of fresh water fishes from river to sea during breeding season for spawning.
- Example: Eel (*Anguilla* spp).
- Both European eel *(Anguilla anguilla* or *Anguilla vulgaris)* and the American eel *(Anguilla rostrata)* migrate from the continental rivers to Sargasso Sea off Bermuda in south Atlantic for spawning, crossing Atlantic Ocean.
- Before and during migration some physiological changes occur in their bodies:

  – Deposit large amount of fat in their bodies which serves as reserve food during the journey.

  – Colour changes from yellow to metallic silvery grey.

  – Digestive tract shrinks and stops feeding.

  – Eyes get enlarged and vision sharpens. Other sensory organs also become sensitive.

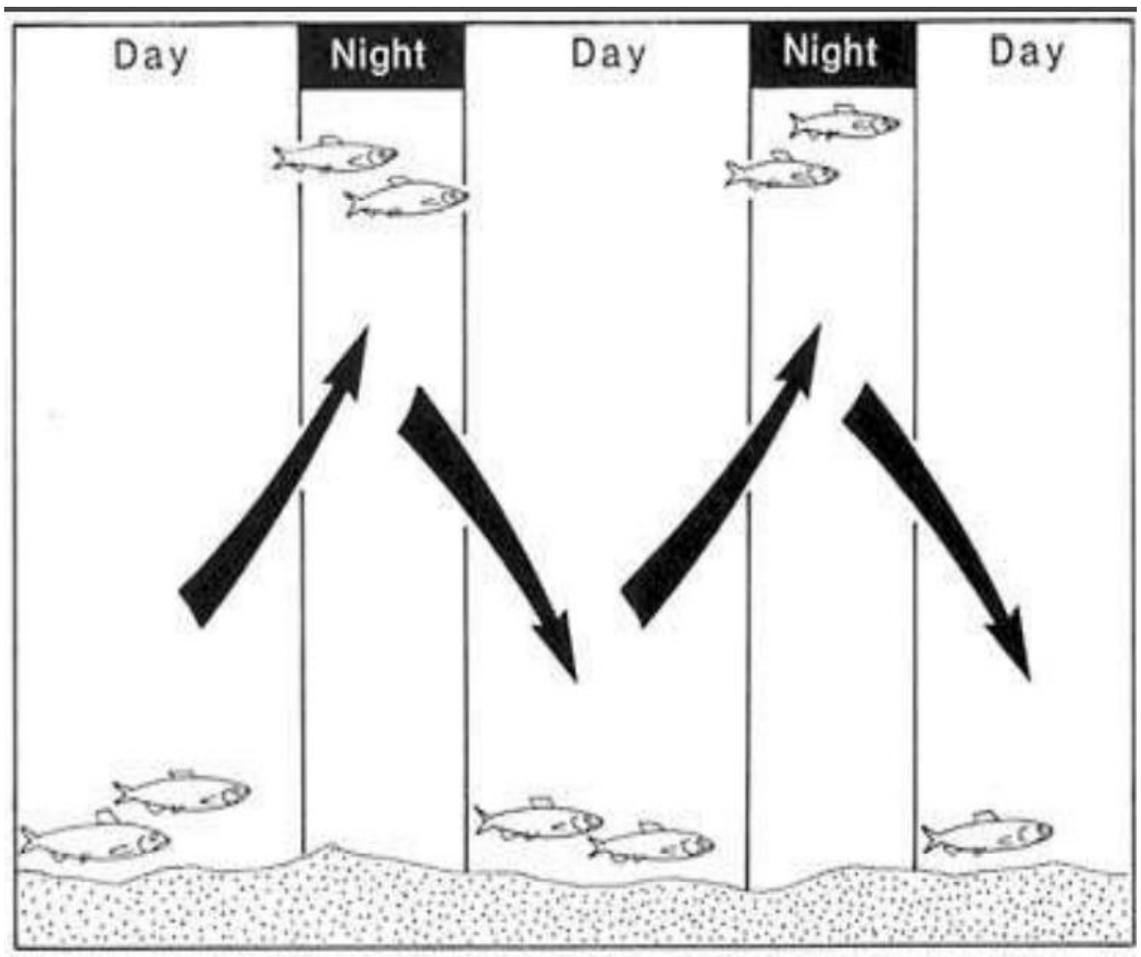
  – Skin serves respiratory organ.

  – Gonads get matured and enlarged.

- They lay eggs in suitable spawning ground and are fertilized by males. After spawning they die. The larva hatch out and develop into young eel and finally return to river.

Vertical Migration:

- The movement of fishes towards upper surface of sea during night and towards bottom during day for various endogenous and exogenous reasons is called vertical migration.
- Factors playing role in vertical migration:
  - ✓ **Endogenous factors:** which originate from organism itself like sex, age biological rhythms etc.
  - ✓ **Exogenous factors:** These are the environment factors acting on the organisms such as light, gravity, oxygen, temperature, predator-prey interactions etc.



Latitudinal migration:

- It is the migration of fish from north to south and vice-versa.
- It is a climatic migration.
- Example: Sward fish migrate north in spring and south in autumn.

Shoreward migration:

- It is the migration of fish from water to land.
- However, it is a temporary migration.
- Example: Eel migrate from one pond to another pond via moist meadow grass.

Significance of fish migration

- To find suitable feeding and spawning ground.
- For protection from predators.
- To survive from extreme climatic conditions.
- To achieve better growth rates and greater reproductive success.
- It is an adaptation characters for survival and existences.