

Migration in fishes

B. Sc. Part-I, Paper II, Group- B

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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.

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 spawning 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 Contrantant movement:** It is an active swimming movement. Denatant movement is swimming with the water current while contrantant movement is swimming against water current

Types of fish migration

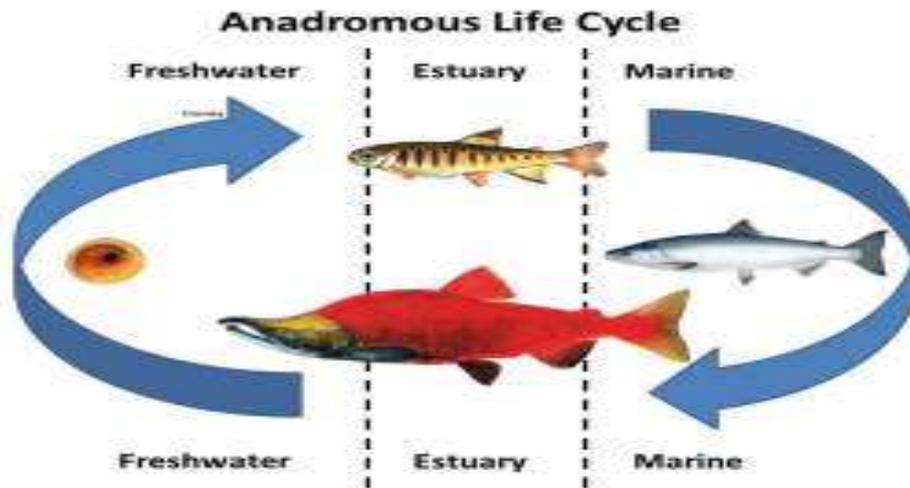
The migration of some fishes is a regular journey and is truly an innate animal behaviour. Many fish migrate long distances to spawn. These migrations are classified into different categories.

1. Diadromous migration:

- it is the migration of fish between sea and fresh water.
- As we know, most of the fishes are restricted to either fresh water or sea water. Changes in habitat may causes osmotic imbalance in those fishes. However, some fishes regularly migrate between sea and fresh water and have perfect osmotic balance, they are the true migratory fish.
- This migration is of two types-

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.
- Eg. *Salmon, Hilsa, Lamprey, American shad etc.*

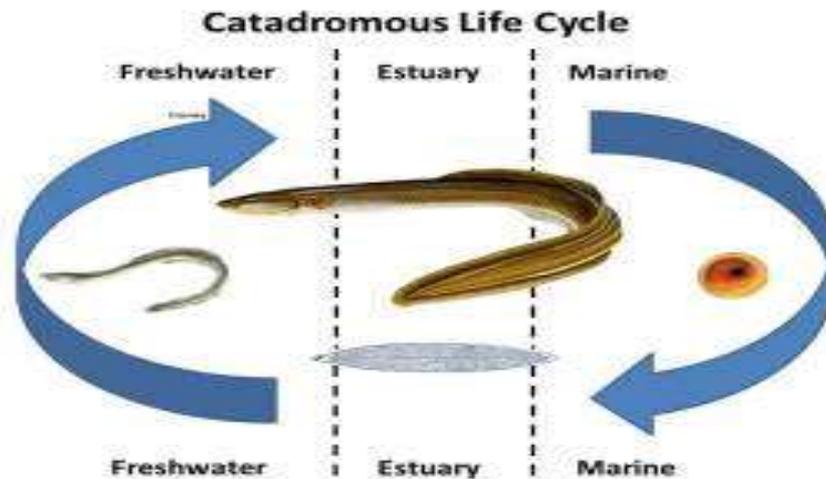


- Salmon migrate for breeding during winter from sea to river. While migrating, some physiological changes occurs:
 - stops feeding during journey.
 - changes colour from silver to dull reddish brown.
 - gonads mature.

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 (a newly hatched salmon when still attached to the yolk sac). Alevins then transform into a juvenile fish called parr and metamorphose into adult when return to the sea.

Catadromous migration:

- It is the migration of fresh water fishes from river to sea during breeding season for spawning. Ex. Eels

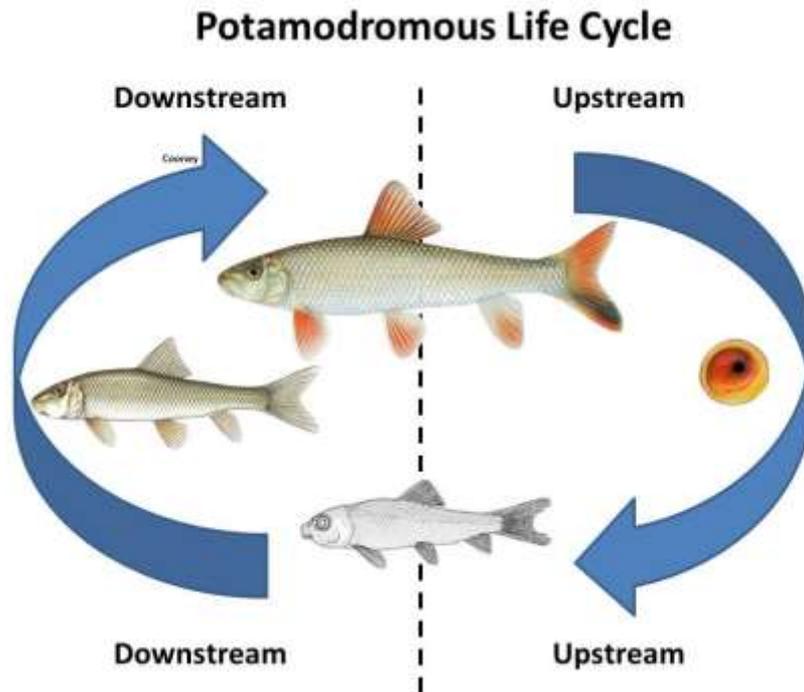


- Both European eel (*Anguilla* or *Anguilla vulgaris*) and the American eel (*Anguilla rostrata*) migrate from the continental rivers to Sargasso Sea off Bermuda in south Atlantic for spawning, crossing Atlantic Ocean.
- Before and during migration some physiological changes occur in their bodies:
 - 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.
- The lay eggs in suitable spawning ground and are fertilized by males. After spawning they die. The larva hatches out and develop into young eel and finally return to river.

2. Potamodromous migration

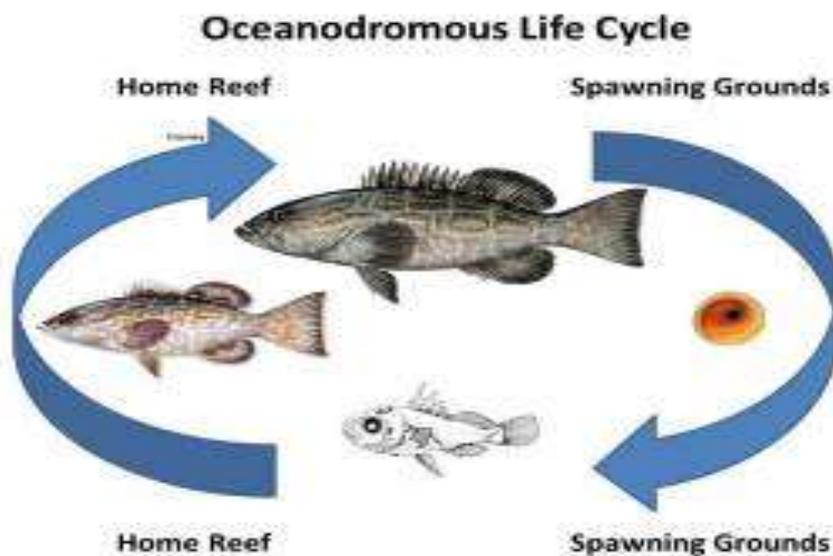
Migration is limited to freshwaters only.

- I. it is fresh water migration of fishes from one habitat to another for feeding or spawning.
- II. Eg. Carps, catfish



3. Oceanodromous migration:

- It is the migration of fish within sea in search of suitable feeding and spawning ground.
- 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.
- eg. *Clupea*, *Tuna*



4. Latitudinal migration:

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

5. Vertical migration:

- it is a daily migration of fish from deep to the surface and vice-versa for food, protection and spawning.
- E.g. Sward fish usually move vertically downward to greater depth for food.

6. Shoreward migration:

- it is the migration of fish from water to land. However, it is a temporary migration.
- E.g. 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
- survive from extreme climatic conditions
- increases genetic diversity
- it is an adaptational characters for survival and existences