Migration of Fishes

The word 'migration' is derived from the Latin word 'migra' which means going from one place to another.

"The movement of a very large number of fishes for the purpose of feeding or spawning is known as migration"

Heape [1931] has defined migration as "a class of movement which implies migrants to return to the region from which they have migrated"

Types of migration :—

[A] According to purpose :—

(a) Alimental migration :— occurs for the search of food and water

(b) Gametic migration — For reproduction

(c) Climatic " — This is to secure more suitable climatic cond^n

(d) Osmoregulatory migration

[B] According to Myers [1949] [based on the nature of migration]

(1) Diadromous migration — It is the migration occurred between the sea and the river [fresh water]

It is of 3 types :—

(a) Anadromous :— In this type the marine fish goes to river for spawning

Examples — 1- Atlantic salmon [Salmo salar]
(2) King salmon [Onchorhynchus] and other salmon sps
(3) Hilsa [Hilsa ilisha] (4) Sea Lamprey [Petromyzon]

sea ← Anadromous ← River [Fresh water]
original home breeding place

[b] Catadromous :- In this type fresh water fishes migrate to sea from river for its breeding period.

Examples [1] European eel [Anguilla anguilla]
[2] American eel [A. rostrata]

River [Fresh water] → migrate → sea [marine water]
original home catadromous spawning ground.

[c] Amphidromous :- These are diadromous fishes [in which migration from — In this type migration] from fresh water to the sea or vice versa is not for the purpose of breeding but occurs regularly at some other definite stage of the life cycle [in not at migratory stage]
Ex- Some Gobies [According to Myer]

[2] Potamodromous :- In this migration remains confined to fresh water
Ex :- [1] Carps [2] Trout
These travel large distance in large rivers in search of spawning grounds and after egg laying, return to the feeding area

[3] Oceanodromous :- Truly migratory fishes which live and migrate in sea Ex — (1) Herrings [Clupea]
(2) Mackerels [Scomber] (3) Tunnas [Thunnus]

Migratory movement of fishes - It is of following types :-

(1) By drifting :- In this the fishes are carried passively by water current

This may result in directional movement if the overall water movement is in one direction.

(2) Random locomotory movement :-
It is performed actively by fishes themselves. It is random in direction. It lead to a uniform distribution [Dispersal] or to an aggregation.

(3) Orientated swimming movements
The fishes swim in a particular direction
(a) either towards or away from the source of stimulation or
(b) at some angle to an imaginary line running between them and the source of stimulation.

~~(4) Denatant movement :-~~
(4) Denatant and Contranatant movement
These terms are used to describe the movement of fish in relation to water current

(a) Denatant means - swimming with the current or migration or movement of pelagic eggs
(b) Contranatant " " against the water current or migration of adult fishes toward the spawning grounds.

Advantage of migration :-

According to Nikolsky "migration is an adaptation towards abundance"

The spawning ground may not have enough food to maintain both the mature and immature members of a large population.

The phenomenon of migration provides new feeding area to developing fishes or fry's fries

Factors influencing migration :-

1. Physical factor :-

(a) Temperature :- Higher temperature of the sea water in summer provides a stimulus to Salmon for seaward upward migration. When the temp of fresh water in rivers rises fishes move upstream for spawning.

(2) The intensity and duration of light :- It also influences the migration of many fishes

Example (a) Lampreys and sturgeon migrate during Night

(b) Clupea [herring] migrates during full moon

(3) Water current :- It also stimulate migration for example it influences the movement of fry fries or fishes for example (a) Spent salmon are carried by the river current towards the sea

(b) Eggs and fry are passively transported along with the current to their feeding grounds

(8) Others eg Bottom material ; Depth of water ; Pressure ; Turbidity.

[III] Chemical factors :- eg PH taste smell of water

(1) Salinity of water – The movement of fishes are restricted within the range of their salinity tolerance

For example (a) The Stenohaline fishes [intolerant to salinity change] do not undertake large scale migration and

(b) The Euryhaline fishes [which are tolerant to salinity change] eg Salmon perform Diadromous migration

[C] Biological factors which influence the migration are eg sexual maturity, blood [illegible], food, memory, physiological [illegible] and endocrine glands.

(1) Availability of food :- It is responsible for alimental migration [of many fishes going out in search of feeding area.]

(2) Smell and memory :- It also appears to (smell) guide fishes during migration.

(3) The stage of maturity of the gonads and the condition of the endocrine glands are also important factors governing migration

Peculiarities of Fish migration :-

(1) migration occurs for egg laying

(2) Fishes cover large distance

(3) After spawning Adult generally die or become so weak [illegible] and [illegible]

(4) At the time of migration the fishes stop feeding.

(5) Spawning migration [toward breeding place]