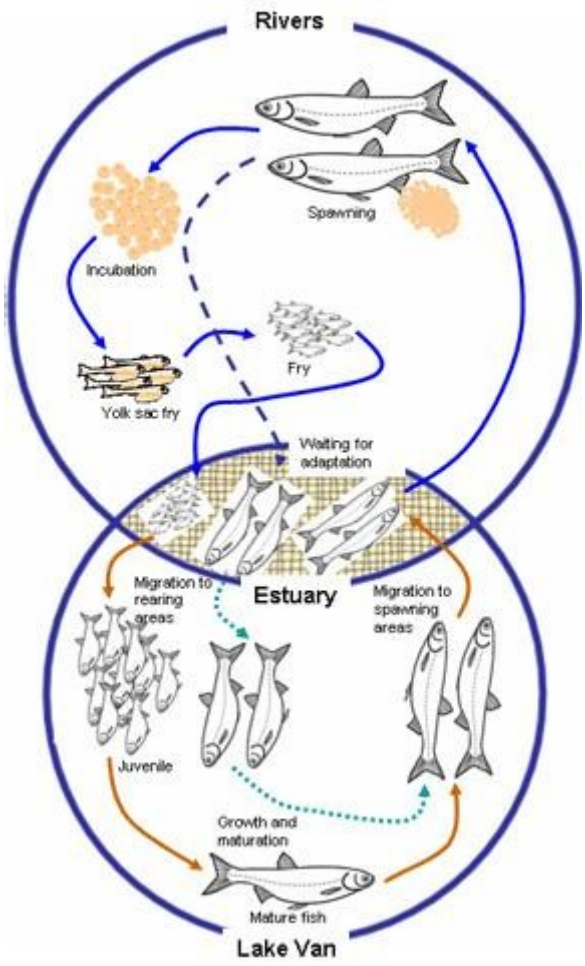
LIFE CYCLE OF THE PEARL MULLET



Life Cycle of the Pearl Mullet

There are five periods during the life cycle of pearl mullets which can be listed as spawning, pouched larvae, fry, juvenile fish and adult fish as in the following:

1. Spawning and Hatching Period: Depending on some internal and external factors such as age, size, and feeding level of pearl mullets, the number of eggs laid may vary from 6,000 to 16,000. A female lays around 10,000 eggs on the average. Eggs are rather small with approximately 1 mm in diameter. Once laid, they become covered with sand, pebble or aquatic plants at stream beds. As water temperature rises over 13 °C, those eggs laid complete their incubation period within 3-7 days

and the period of pouched larvae begins.

2. Yolk Sac Fry Period: Larvae are approximately 5-7 mm long at hatching with a spawn pouch on their outer body. Reaching an optimum size to be able to feed on plankton at the external environment takes about 4-6 days. During this time period, larvae still continue their feeding out of the spawn pouch.

3. Fry Fish Period: Within 4-6 days after hatching, pouched larvae reach an optimum size to feed on plankton at the external environment. So, they cast the pouch away and become tiny fry fish. It is approximately 1-2 cm long at this period looking exactly similar to adult fish. It immediately starts feeding at those pond-like areas along stream beds with low level of flow. Phytoplankton are major food items for pearl mullets during this period. As it ends, the fry fish also starts feeding on zooplankton. This period varies from 3 to 15 days depending on environmental conditions. As soon as fry fish reach an optimum size to swim easily and to avoid their enemies, they return to Lake Van immediately. The longest distance they can travel around to return the lake is 23 km.

4. Juvenile Fish Period: As they move to salty-alkaline waters of Lake Van within 15 days or so after hatching, larvae now become small fry fish. Those can reach the lake are approximately 2-4 cm in length. Fry fish cannot move directly from the river to the lake. If ion density is not regulated in the body, it dies instantly in waters of the lake. Still depending on various external factors for physiological adaptation, it needs to wait shortly at river mouths flowing into the lake. Once ionic regulation in their body is finalized, they move to the lake and feed in shoals nearby the nutritiously richer areas along the lakeside. There is a rapid rate of growth during the juvenile period because fish consume the majority of food items to grow faster. Both

phytoplankton and zooplankton are their main source of food during this period. As they grow, the share of zooplankton within their daily diet will also increase. A spread of juvenile fish is mostly seen in shallow waters along the lakeside from sunset to sunrise. This is an ideal time of the day to avoid enemies. Sometimes late in the evening or early in the morning, shoals of juvenile fish can be seen along the lakeside. Moving together, they look like as a block of stripes that is 500 m. in length and 10-30 cm in width. After spending summer in shallow waters, juvenile fish tend to move deeper in the lake as water temperature falls by autumn. They are 10 cm long and weigh about 12 g when a-year old. It is impossible to determine the gender of fish with an unaided eye during this period. Gonads are almost mature but only by using a microscope we can determine whether fish is male or female. The juvenile period continues until fish reaches the reproductive maturity i.e. until it is 3 years old when it usually prefers mixing more with adult fish. Juvenile fish stays in those areas of the lake with lower water depth in winter when compared to adult fish. Unless the weather gets really cold, they prefer wandering around areas with higher adult distribution. At the end of their second age, juvenile fish grow to a length of 13-14 cm and a weight of 25-30 g. Some meaty juvenile fish can reach their reproductive ability at the age of 2. But considering the population average, it can be said that they reach their reproductive maturity at the end of their second year or at the beginning of their third year. On the average, juvenile fish are 15-16 cm long and 40-50 g weigh at the age of 3. They are not juvenile anymore, and they become adult fish now.

5. Adult Fish Period: Although some juvenile fish become adults by reaching their reproductive maturity at the age of 2, the adult fish period for the pearl mullet population in Lake Van usually begins at the age of 3. During this period, fish has a

length greater than 16 cm. As adults now, juvenile fish join them in shoals by moving to areas with higher adult fish distribution. This is commonly known as recruitment in population dynamics which mostly takes place during the springtime. The distribution of juvenile fish is higher around adult shoals, and they follow adults when they move closer to outfalls as the spawning migration starts. Adult fish can move to rivers for spawning migration only after their physiological adaptation is finalized. By the end of March, adults in shoals move to those areas of the lake nearby river mouths and start waiting for physiological adaptation. It is exactly at this waiting period that those juvenile fish with reproductive ability enter into adult fish shoals. After they regulate ion density in their bodies according to the freshwater temperature, adult fish begin their spawning migration when it rises above 13 °C. The spawning migration is undertaken by adult fish to avoid from enemies and to lay eggs in a safer locality. It usually becomes more hectic from sunset to sunrise. But it also continues during the day. After laying eggs along the river at those low flow areas covered with pebble, sand and sometimes with aquatic plants, adults return to the lake. Since fish does not feed on any food items during migration, it needs to return to the lake as soon as possible. Still depending on environmental conditions, the period of time for fish to spend in the rivers varies from 1 to 7 days. After laying eggs, adult fish start their journey back to the lake immediately. They need to wait shortly again depending on environmental conditions for physiological adaptation at river mouths where freshwater flows into the lake. Once they regulate ion density in their bodies in accordance with environmental conditions, adult fish move into the lake. They feed at a faster pace in such areas of the lake not deeper than 20 m, and they start getting prepared for the spawning migration in the next year.

View more https://mvatoi.com.vn/incikefali.html