What is an anadromous fish? An anadromous fish, born in fresh water, spends most of its life in the sea and returns to fresh water to spawn. Salmon, smelt, shad, striped bass, and sturgeon are common examples.

What is a catadromous fish? A catadromous fish does the opposite - lives in fresh water and enters salt water to spawn. Most of the *eels* are catadromous.

How old are salmon when they migrate from fresh water to the ocean?

That depends on species:

- Chinook--
  - fall chinook, 3-4 months after hatch;
  - spring chinook, 12-16 months;
- Coho--12-24 months;
- Chum--a week to a month;
- Sockeye--12 months to 36 months;
- Pink--a week to a month.

Where do salmon go in the ocean?

Many salmon from North American rivers roam far at sea in the North Pacific Ocean and the Bering Sea. Sockeye and chinook salmon from northwest Alaska, for example, may migrate across the Bering Sea to areas close to Kamchatka, U.S.S.R., and south of the Aleutian Islands into the North Pacific Ocean; the sockeye also migrate eastward to the Gulf of Alaska. Salmon such as the pink, chum, and coho from central and southeast Alaska, British Columbia, and Washington State, migrate out into the northeastern Pacific and Gulf of Alaska. Many steelhead trout from Washington and Oregon are known to migrate far at sea to areas off the Alaskan Peninsula. Some salmon migrate several thousand miles from the time they leave the rivers as juveniles until they return as adults. **A chinook salmon tagged in the central Aleutian Islands and recovered a year later in the Salmon River, Idaho, had traveled about 3,500 miles;** a steelhead trout tagged south of Kiska Island (western Aleutians) was recovered about six months and 2,200 miles later in the Wynoochee River, Washington.

Do fish drink water? Freshwater **fish do** not actively drink water, but absorb the water through their skin and gills. On the other hand, **saltwater fish do** actively drink seawater. Their gills **process** the water and take out the salt.

What is osmoregulation?
Osmosregulation is the control of body fluids and ions during the transition from fresh water to salt water and back again. This is an important transition in the life of every Pacific salmon. In preparation for their time at sea, these small fresh water fish must adapt their biology to survive in salt water, then enter an ocean they've never seen.

How exactly does it work?
Three main things must occur for the young salmon, called a smolt, to prepare for life in the salty ocean. First, it must start drinking a lot of water. Second, the kidneys have to drop their urine production dramatically. Third, and very important, molecular pumps in the cells of the gills have to shift into reverse, pumping sodium out instead of in. All these physiological changes have to change back when then the mature fish re-enters the freshwater river on its way to spawn. The fish will spend a few days in the intertidal zone as these changes are made automatically.

How many eggs do salmon have?
Generally from 2,500 to 7,000 depending on species and size of fish. The *chinook* salmon generally produces the most and largest eggs

Do some fish give birth to living young?
Yes, many do. These are called viviparous fishes. The sea perches of the Pacific coast, for example, give birth to living young of considerable size, sometimes one-fifth the size of the mother. Several kind of sharks produce living young

How is the age of a fish determined?
Mainly by two methods: Growth "rings" on scales, and/or ringlike structures found in otoliths (small bones of the inner ear), are examined and counted. The rings correspond to seasonal changes in the environment and can be compared to the annual rings of tree trunks. A series of fine rings are laid down in scales for each year of life in summer, the rings grow faster and have relatively wide separations; in winter, slower growth is indicated by narrow separations between rings. Each pair of rings indicates one year. Because scale rings are sometimes influenced by other factors, scientists often use otoliths, whose ringlike structures also indicate years of life.