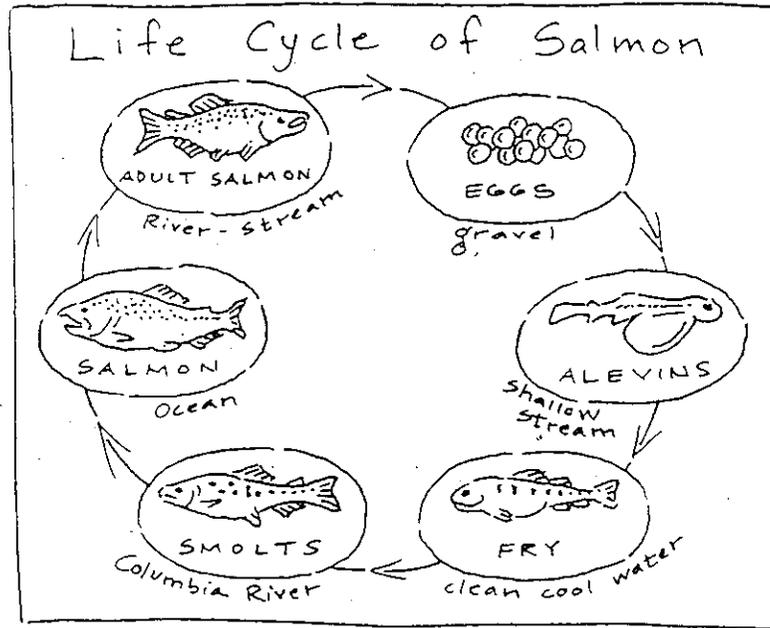


SALMON LIFE CYCLE

Grades 4-6



Overview

The students read a handout on the salmon's life cycle; they discuss the characteristics of the salmon and its habitat for each stage. The class plays a "salmon cycle game." Each group of students has a set of salmon pictures representing each cycle stage. The teacher will read a description of one stage without giving the name of the salmon at that stage. The teacher asks every student to quietly point to the picture that represents that stage. There is time for quiet clarification should students disagree in their group. When the teacher signals, each group holds up only one picture. The students discuss what the correct stage is, and the teacher awards points to the groups with the correct picture. The class ends with the students creating a salmon cycle booklet.

Objectives

- Students will be able to identify the salmon's appearance, needs and habitat for each stage of the salmon's cycle.
- Students will be able to identify five to seven things they can do to save salmon.
- Students will be able to name the five types of salmon.

Materials

For the presenter:

- an overhead projector
- a transparency of the *Life Cycle of Chinook Salmon*
- an information handout of the Salmon Life Cycle which describes each stage
- a set of salmon pictures (8 pictures total)
- directions for making the booklet
- a sample booklet
- the poster: *A Salmon's Story: The Journey of the Oncorhynchus*, available from BPA Public Information Center
- a copy of the handout "*Seven Ways to Save the Pacific Northwest Salmon*"

For the students:

- an information handout of the Salmon Life Cycle which describes each stage
- a set of salmon pictures for each group
- a booklet page for each student (attached)
- the booklet directions (attached)
- a copy of the handout "*Seven Ways to Save the Pacific Northwest Salmon*" (attached)
- dictionaries

Vocabulary

Anadromous: to migrate from seawater to fresh water to spawn

Migrate: to move seasonally from one region to another

Spawn: to deposit eggs directly into water

Getting Ready

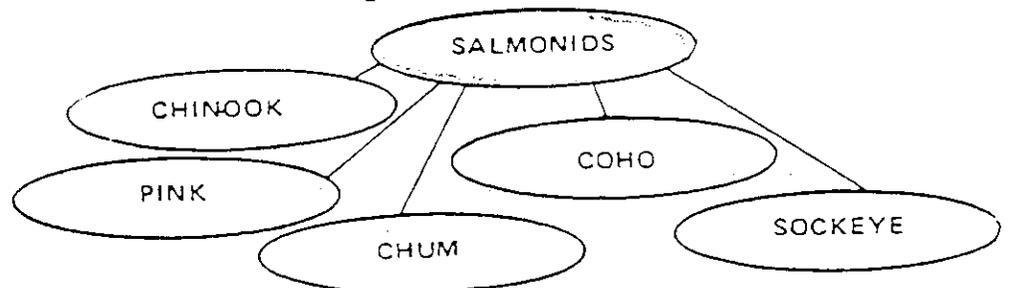
Make copies of salmon pictures, booklet page and directions, and two handouts. Set out all the materials on a table for easy access for both the teacher and the students. Make overhead transparencies of the salmonids diagram and *The Life Cycle of Salmon*.

Procedures

1. **Focus:** Explain as human beings grow and change in appearance and age, we are given different names. Ask the class: “What a human being is called when it is first born? (*Baby*) What common term is given to a child when they are first learning to walk? (*Toddler*) What are individuals called who are in between the ages of thirteen to nineteen? (*Teenager*) What is a person called who is twenty-one years old or older?” (*Adult*) Just as the human being’s form and name changes in its life cycle from a baby to an adult, so too the salmon’s appearance and names change in its life cycle.
2. Share the objectives with the class.
3. Give the handout of *The Salmon Life Cycle* to the students. (See attached)
4. The teacher shows the salmon life cycle transparency to the class while giving the following directions. “All of us are going to take an imaginary journey with the salmon to learn about each stage of their life cycle. You will want to listen carefully to the description of each stage because later you are going to be playing a game which challenges your memory of each stage. Also, you will be illustrating a booklet in which you will draw the salmon, its habitat, and events for each stage; so visualize each stage, see the salmon and its surroundings in clear detail. We are going to stop at the end of each stage and discuss what is characteristic about the salmon and its habitat, but before we do this we need to look up some terms in the dictionary.”
5. The students look up the vocabulary words: *anadromous*, *migrate*, and *spawn*. Write the words and their definitions on the blackboard or a transparency as the students agree on them.
6. The teacher and the students take turns reading and discussing each stage.

The teacher explains that the term salmon is a name given to a group of fish within a large group of fish called “salmonidae”, or salmonids. The teacher draws the *salmonids diagram* (see attached diagram) on the overhead or makes *salmonids diagram* into an overhead transparency.

Salmonids Diagram



7. For extra credit a few students can look up the five salmon and research them giving an illustrated report to the class. They should explain why they are/aren't anadromous.
8. The students play the Salmon Cycle Game. The teacher passes out the pictures to each group, and then explains how the game is played to the students using the following instructions. "Each one of you in your groups has a number, and I am going to give you your numbers right now. (If there are four students to a group, the teacher gives each student a number 1-4.) I will describe one stage in the salmon's life. Each group will quietly discuss which picture they should hold up. Speak quietly with your heads together so the other groups will not hear you. When I say, "*number*," I will pause and all of you must be quiet. If a group talks about anything, after I call out, "*number*" then that group can't get any points even if the student holds up the correct picture. After my pause, I will call a number out, and the student at each group with that number, without help from their group, stands and holds up the picture of the salmon that matches the stage. If the group helps the student select a picture after I call out the number, the group will not receive any points. When you stand, hold the picture facing your chest so other groups can't see it. (The teacher demonstrates how to hold the picture.) Once students select a picture, they can't change their minds. After I call the number, I will count to five out loud; if a student isn't standing with a picture by the time I say five, that group will not get any points. Next, I will say "*show*," and all standing students turn their pictures so the whole class can see them. I then give points to each group with the correct picture, and the class politely discusses why a picture is or isn't correct.
9. We will have a couple of practices before we actually begin the game with "points." The teacher then runs through the procedure a couple of times so the students know how to play. The class plays the game.

Closure

The teacher passes out the booklet page and the booklet directions to each student. (See attached booklet directions) He explains how to fold each booklet page and waits for each child to follow the directions step by step. The students draw a picture and write one to three short sentences for each stage on each page.

Vocabulary

Anadromous: to migrate from seawater to fresh water to spawn

Migrate: to move seasonally from one region to another

Spawn: to deposit eggs directly into water

The Salmon Life Cycle

The Pacific salmon begin their lives in freshwater, later they migrate to the ocean, and eventually they return to freshwater to spawn and die. We are going to use our imagination to travel along with the salmon. Picture a 12 inch deep, cool, clear pool at the edge of a stream on Mount Hood. It is December and here is where the salmon life-cycle begins when eggs are deposited and fertilized in gravel bottom. Until they hatch, the cold (40° to 65° F) water flows through the gravel delivering oxygen and carrying away wastes. Hundreds of fertile eggs are protected from predators in their fish nests called *redds*. The redds are made up of rocks arranged in a circle about two feet in diameter with gravel bottoms.

In late winter or spring, the eggs hatch. The young fish, about one inch long, are called *alevins*. They depend on the cold, well-oxygenated water for their survival and remain in the gravel for shelter. The alevins are fed from a yolk sac, an orange pouch on their bellies. When they are about three months old and their yolk sac is used up, the fish, now called *fry*, are hungry as they emerge from the gravel in late spring or summer.

The fry of some species head directly for the ocean, but others stay in freshwater for a few months to a few years. Fry depend on stream side vegetation and the turbulent water at the head of their pool for cover. Their sides have dark bands or parr marks to camouflage them so their predators won't see them. They dart over the stream's rocks to snatch the small insects that live here. But as they swim into the stream looking for their food, they are open for attack from trout and other large fish. Out in the open stream, the young Chinook become prey for the wading blue heron and the beautiful blue birds called kingfishers.

One year later, the fish are about the length of a human finger and so are called *fingerlings*. Their parr marks have faded as they swim into Hood River's swift current. Once in the current they do not swim; they float downstream mainly at night to avoid predators. Their diet consists of flies, larger insects and worms.

Hood River flows into the Columbia River, and soon the salmon are in the reservoir created by Bonneville Dam. The electricity that light and heats many homes in Portland is made by the dam, but the fish don't like the reservoir. They are confused and uncomfortable for there isn't any current to indicate which direction to travel in and the water is warm. Chinook like cold water. They are watch out for the large warm water fish like bass and walleye, but they are not aware of the greater danger ahead. Dams produce power by shooting water past turbines, and even though the blades will most likely not hurt them, the fish fall about nine stories from the top of the dam to the bottom in a second's time. Some of the Chinook are seriously hurt, while others are just stunned yet become easy prey for the gulls and other birds ready to swoop down and snatch them.

When they are ready to migrate to the sea, they go through a physiological change, ***smoltification***, which prepares them for their life in the salty sea. Now they are known as ***smolts***.

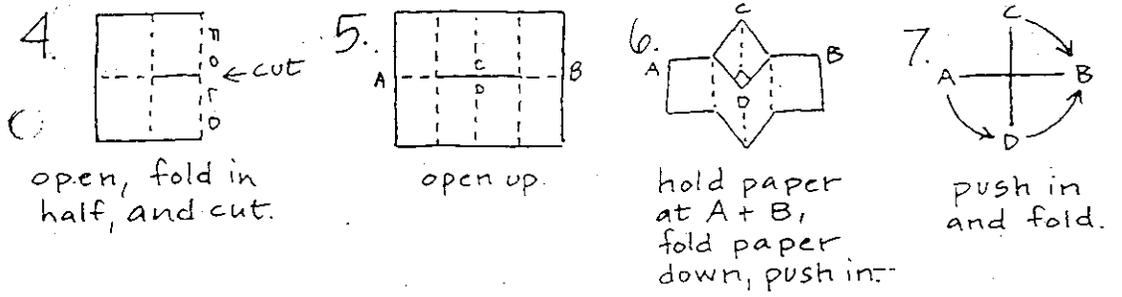
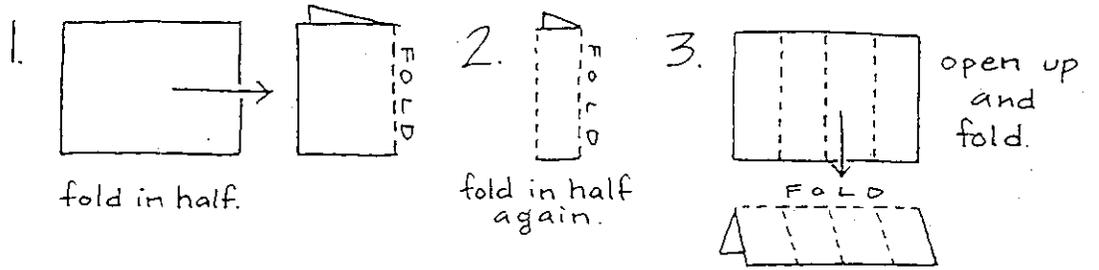
Some salmon never make it to the sea, for in their hunger they snatch at an insect only to be reeled in by a fisherman. Others swim on and where the river widens and has a salty taste, the salmon are in the Columbia River where it meets the Pacific Ocean. This area where the fresh water mixes with the salty sea is called an estuary.

Out in the sea, the fish the first year are small enough to swim through the fishing boat's net, but next year they might find themselves on the fishing boat's deck. Depending on the species, the salmon will spend up to five years in the sea feeding and growing before they are ready to make the return trip back to fresh water. There is the bright red *sockeye salmon*, the humpbacked *pink salmon* and *chum*, or dog, salmon. They show the wear and tear of their rugged journey; some even bear the wounds of the sea lion.

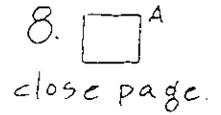
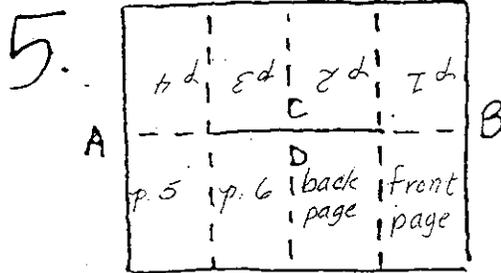
Now the salmon head for home. They return to spawn in the same stream where they hatched. It is not known for certain how they find their way back to the same stream; one theory is that they can smell or taste the water chemistry of their home stream. As soon as they enter fresh water, salmon stop feeding. The stored energy from living in the ocean carries them through their upriver journey. As they swim home, they avoid the warm water released by factories.

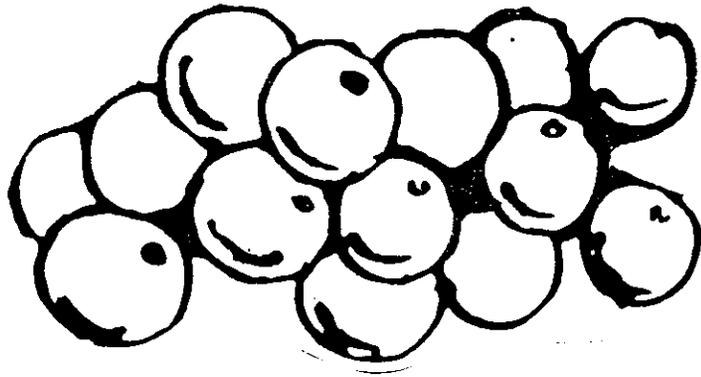
Now adult salmon up to four feet long, they return to their birth stream where they hatched. The female chooses a shallow spot in the shade where the water runs fresh, but not too rapid.

Booklet Directions:

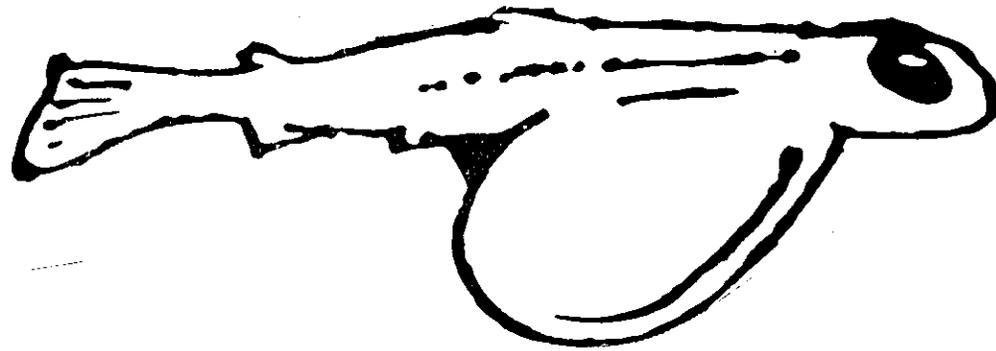


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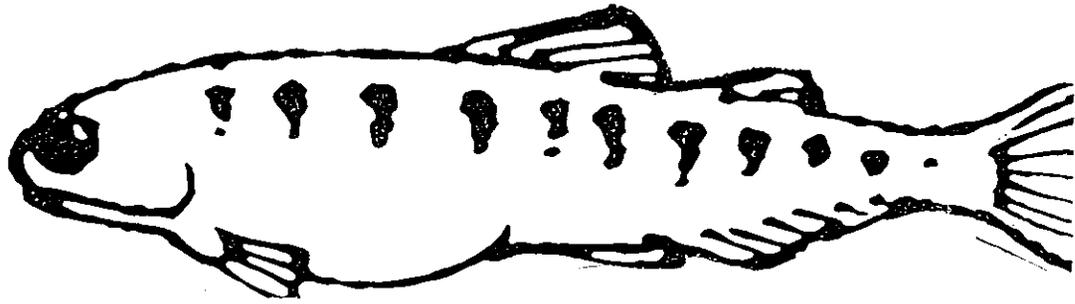




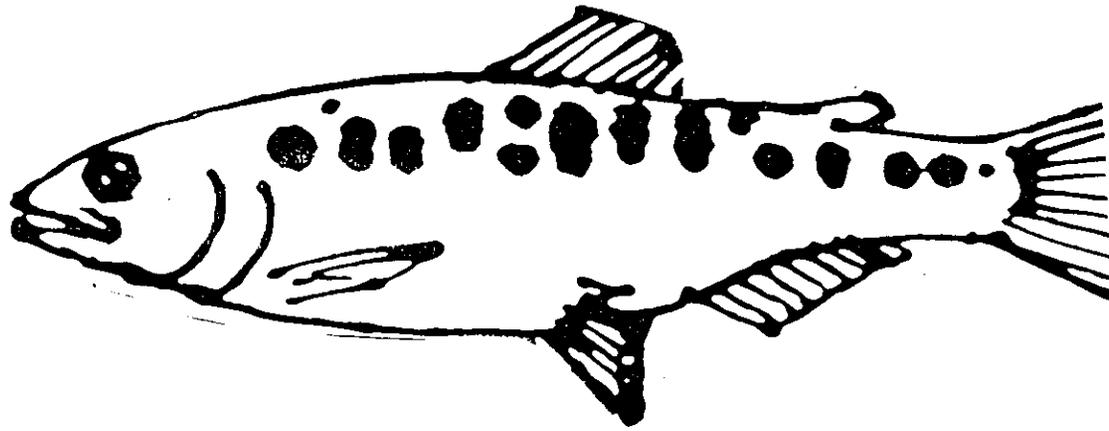
Eggs



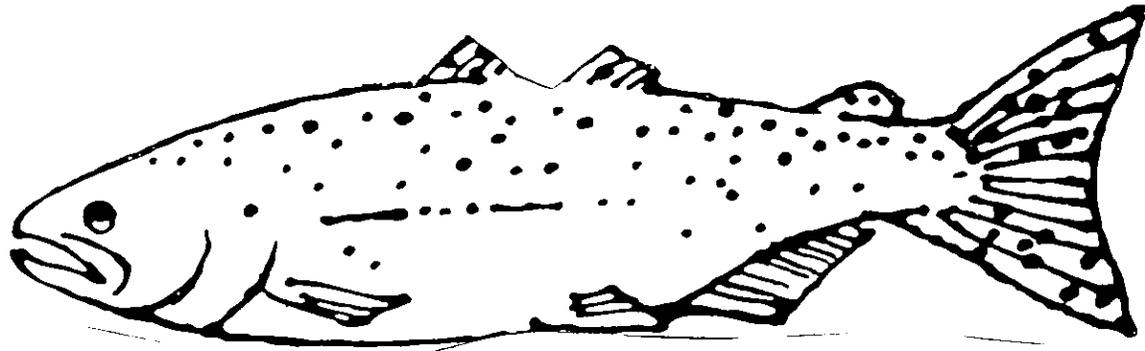
Alevin



Fry



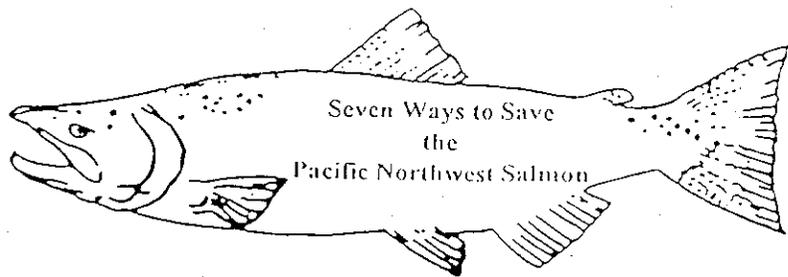
Smolt



Salmon



Adult Salmon



Following are seven examples of what each of us can do to help salmon.

1. **Conserve Water.**

Use less at home to save more for fish!

2. **Do NOT dump any waste in streams or ditches.**

Lawn grass, pet droppings, or trash in streams hurts fish and may spread disease.

3. **Do NOT pour anything into storm drains.**

Storm drains lead to streams. Oil, gasoline and chemicals will kill fish.

4. **Use less chemicals.**

Fertilizers, bug and weed killers, detergents and drain cleaners are all poisonous to fish and other wildlife.

5. **Use less electricity.**

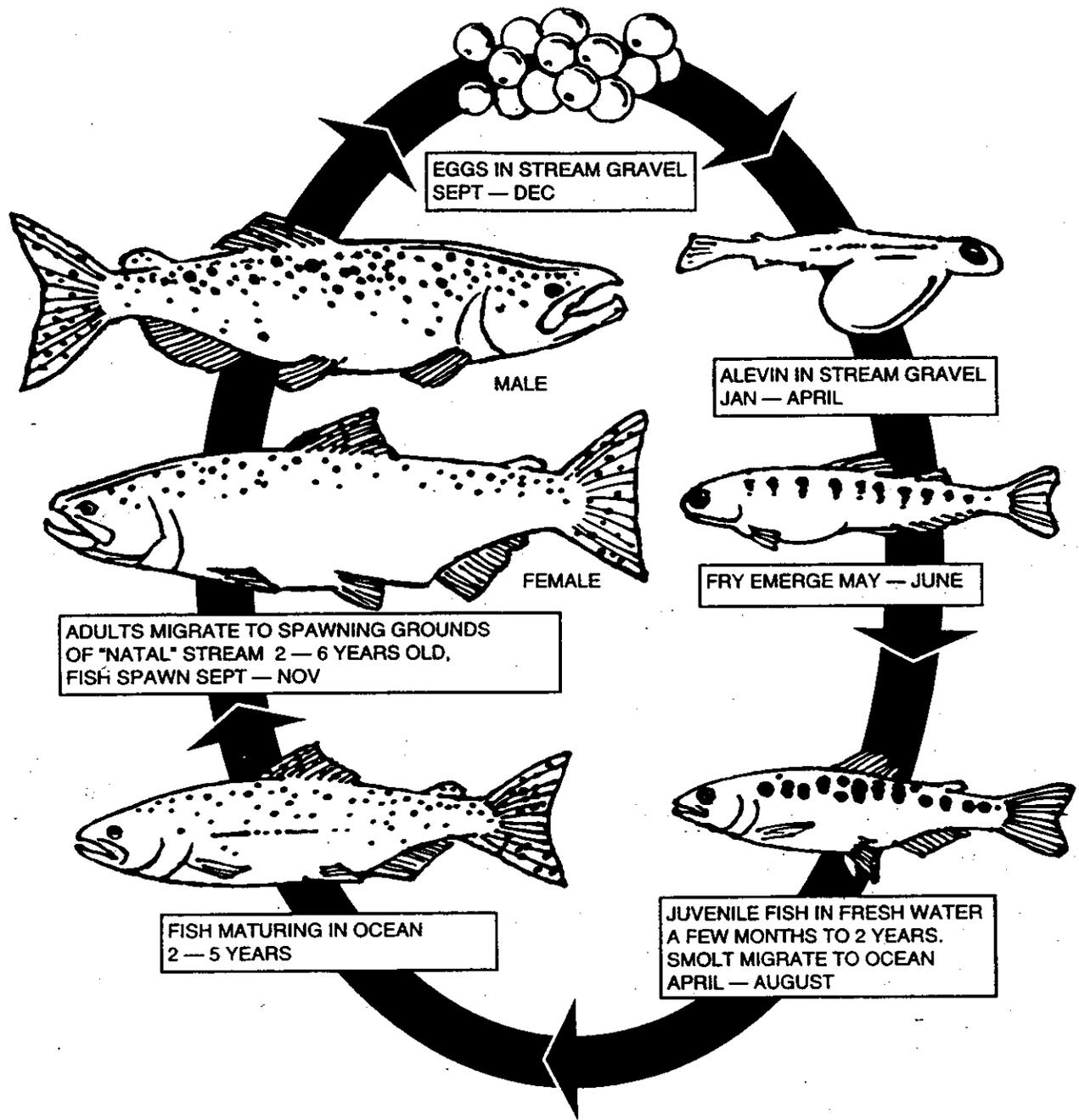
The Northwest uses rivers to make hydroelectric power which is our main source of electricity. Using less electricity leaves more water for fish in the rivers.

6. **Plant trees beside streams.**

Salmon and trout need cool shady water to survive. Trees also stop erosion and provide more food for fish.

7. **Ask others to help.**

Talk to other people about how to help streams and fish.



LIFE CYCLE OF CHINOOK SALMON