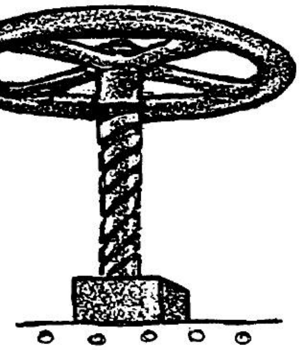


Teacher Background

Dams Across the River

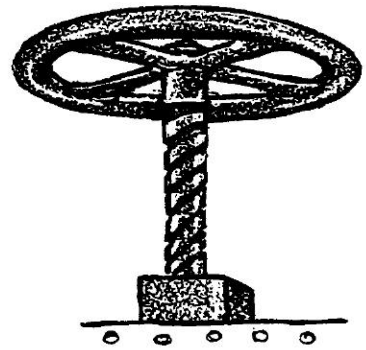
DAMS ACROSS THE RIVER touches upon the enormous impact the construction of hydro-electric dams have made upon salmon runs since the early part of this century. In a few short years, many unique and irreplaceable strains of salmon were lost because vast areas of essential spawning habitat were made inaccessible by the presence of dams.

The impact of dams upon salmon runs was recognized at the time. Infact, state law prohibited the construction of dams unless fish ladders were provided to help the salmon around the impass. But the demand for cheap power was so great that the law was often overlooked, and ladderless dams were built on rivers all over Washington. This compromise was based on the assumption that salmon hatcheries could replace lost spawning habitat, and that Washingtonians would be able to enjoy both inexpensive power and salmon at the same time.

Hatcheries are able to produce much great numbers of salmon from a given number of eggs than a wild habitat. This is because the hatchery environment offers eggs and fry protection from predators, siltation, water shortages, and the effects of human activities. Fry or smolt raised in hatcheries can then be transported to streams where natural populations of fish have been destroyed in order to restore lost salmon runs.

Hatcheries have certainly kept large populations of salmon returning to the Puget Sound area even as salmon habitat declined, yet most fisheries experts agree that hatcheries are not without problems of their own. First of all, fish are expensive to feed and maintain in a healthy condition. Because so many thousands of eggs and fry are kept close to one another, diseases in a few fish can rapidly spread through the hatchery. Antibiotic medications which are not needed in wild stocks may need to be used routinely in a hatchery situation.

One of the more intriguing and profound questions which surround the trade-off of wild salmon stocks for hatchery rearing involves whether hatchery rearing alters the very genetics of these fish. Natural spawning may appear inefficient, yet the process itself may weed out the less adapted individuals and help create the hardy characteristics native salmon are famous for. Are hatchery fish less likely to be healthy and strong than wild salmon? DAMS ACROSS THE RIVER sets the stage for TOOTHPICK FISH, which looks more closely at this issue.



Lesson Plan

Dams Across the River

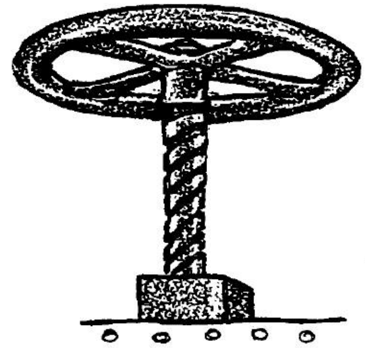
Answer Key:

1. Lake Cushman and Lake Kokanee

2. Answers will vary. The purpose here is just to get the students to think about these issues. The power companies may have argued that they couldn't afford the extra expense of a fish ladder. Or, they might have promised electric power at very low rates to Washington residents.

3. Again, answers will vary. The State may have felt that cheap electric power was more important than wild salmon runs. It may also have believed that hatcheries could adequately replace wild runs of salmon.

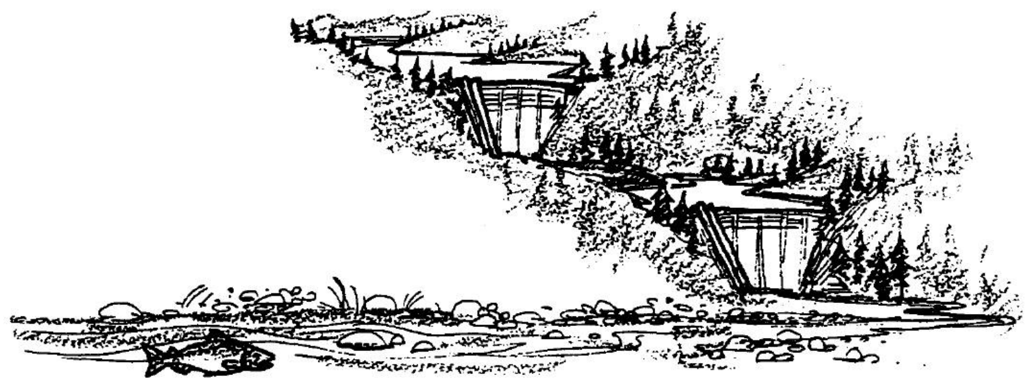
4. Answers will depend on attitudes of students.



Dams Across the River

As she works her way upstream, Hyak has reached a fork in the river. To her right is the North Fork, a large river bed with only a small stream down the middle. Could this be the way?

No, something is very wrong here. This river has practically no water in it. If she were able to follow it very far she would discover another reason salmon never reach the upper streams. Power dams.



These two dams block the river, forming two lakes.

1. Use your SKOKOMISH RIVER WATERSHED AND LAND USES MAP to find the names of these two lakes.

Most of the water leaving these lakes doesn't return to the river. Instead the water is piped overland to a power plant in Hoodsport which generates electricity for the city of Tacoma. Now only a small stream flows down the North Fork, and it is too small for a big fish like Hyak.

Even if the water still flowed down the North Fork, salmon could not reach most of the watershed because of the dams themselves. Oddly enough, even when they were built in the 1930s it was illegal for anyone to block a salmon river with a dam without providing a "fish ladder." A fish ladder is a special chute which salmon can use to get past a dam. But power companies in Washington were eager to avoid this extra cost, and the State of Washington agreed not to force them to. The law was ignored. All over Washington this pattern was repeated, and fish ladders were built on only a few Washington rivers.

2. Why did the power companies not want to put fish ladders on their dams?

3. Why do you think the State decided not to require the power companies to obey the law?

When the dam was built all the salmon which traveled above the dam on the North Fork could not spawn so these fish runs died out. To help repay the State for the loss of most of the North Fork salmon runs, the power company paid for the construction of a fish hatchery on another part of the river.

4. Why would building a fish hatchery seem like a fair price to pay for the loss of a salmon run?

Today at least half the chinook in this river and around Puget Sound begin their lives in hatcheries. Hatcheries have kept salmon abundant in Puget Sound, but they are not without some problems. Diseases can spread more easily through eggs and fish crowded so close together. Salmon are expensive to raise. Even more important, many people wonder about whether hatcheries are even producing the same salmon that lived in Puget Sound rivers 100 years ago.

Could raising salmon in hatcheries cause changes in the fish? In WILD SALMON/HATCHERY SALMON you will get a chance to find out. You will begin by learning something about genetics, the science of heredity.