Saving the Salmon

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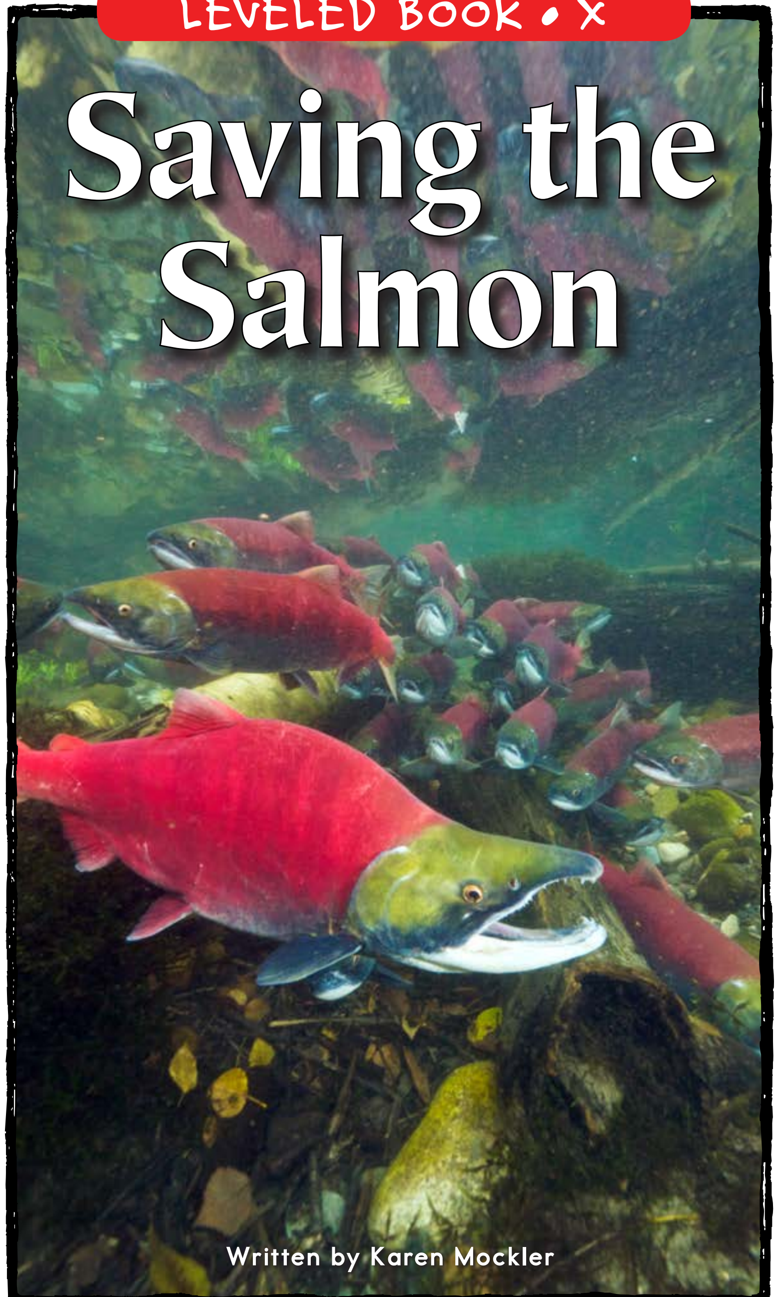
LEVELED BOOK • X



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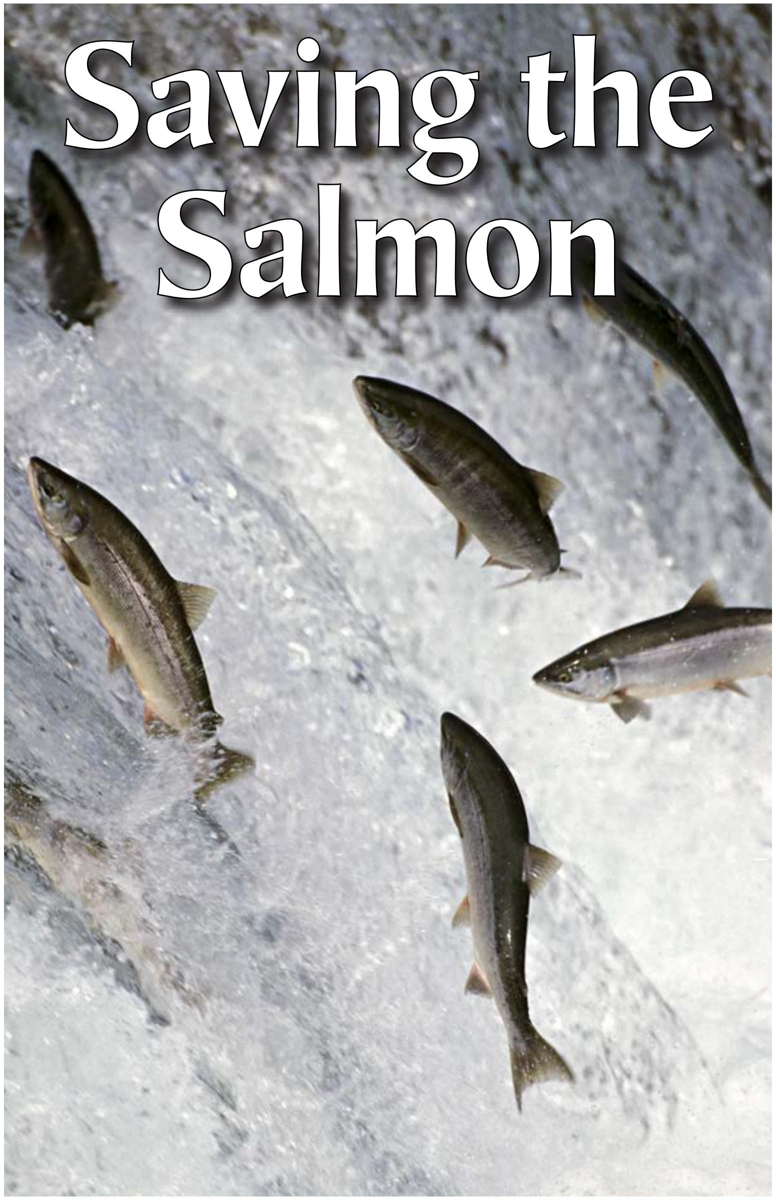

Written by Karen Mockler

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Front cover: The Adams River in British Columbia has one of the largest sockeye salmon runs in North America.

Back cover: A salmon “climbs” a fish ladder on Oregon’s Rogue River.

Saving the Salmon
Level X Leveled Book
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Correlation

LEVEL X	
Fountas & Pinnell	S
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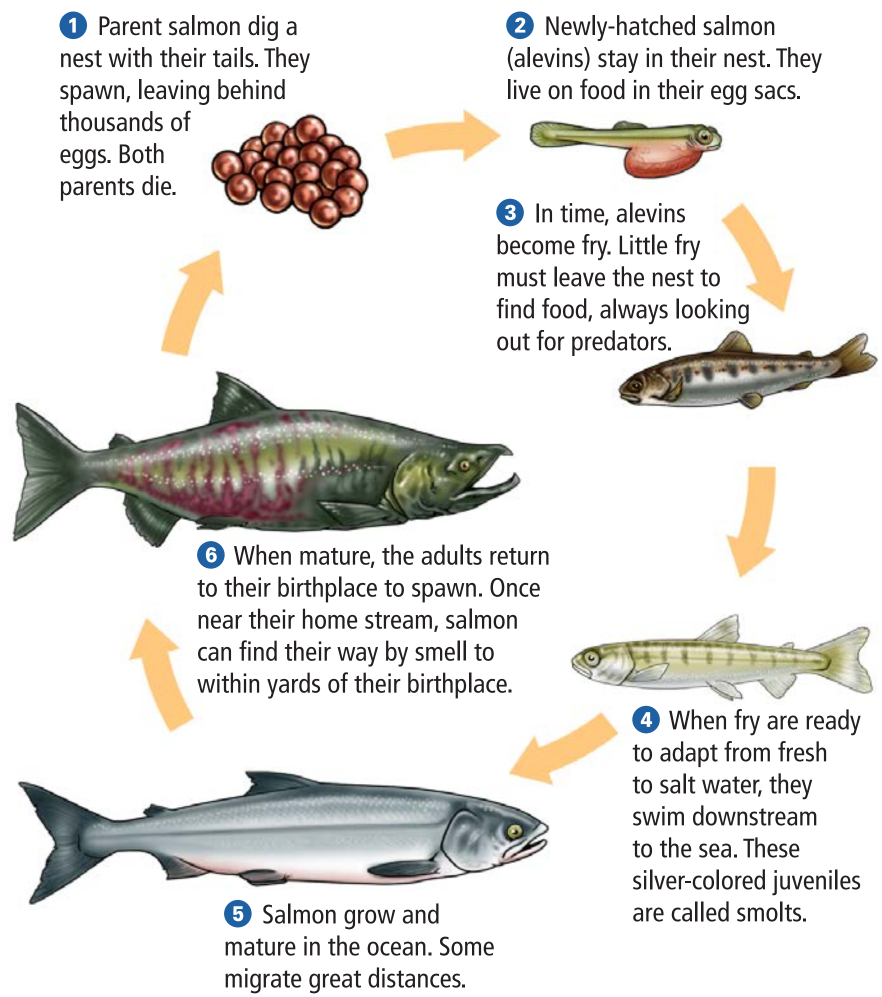
Introduction

Salmon know how to travel. They don't live a long time by human standards—only a few years. But during that time, they make a more epic journey than most of us ever will.

Salmon Life Cycle



Both Pacific and Atlantic salmon are born in fresh water. They make their way to the open ocean to grow up. Very few creatures are able to live in both salt water and fresh water. Fewer still can **migrate** 3,000 miles through the ocean, then as many as 1,000 miles upstream, in order to reach the exact spot where they once hatched.

To get home, salmon have to make it past fishing nets, sea lions, dams, and more. It is a long, hard, and desperate race. Only one out of a thousand salmon may make it back to the stream where it was born. Salmon do all of this just to **spawn** and then die.

Yet salmon in many U.S. rivers are dying before they spawn because of changes that people have made to those rivers. Some of the biggest changes—and biggest challenges to salmon survival—are on the Columbia River in the Pacific Northwest.

A sea lion catches a Chinook salmon migrating up the Columbia River. Many wild animals, from tiny insects to grizzly bears, depend on salmon for food.

The Mighty Columbia

The Columbia River is the biggest river flowing into the Pacific Ocean from North America. It drains a 259,000-square-mile basin—roughly the size of France—that includes land in seven Western states. It begins in the Canadian Rockies of British Columbia, and its **tributaries** come from as far east as Yellowstone National Park. The river's last 300 miles form the Washington–Oregon state line.

Fishermen unload their nets of salmon on a pier a century ago.

At one time, six **species** of Pacific salmon are known to have lived in the Columbia River Basin: Chinook, coho, sockeye, chum, pink, and steelhead. Five of the six species are still found there. Pinks are **extinct** in that river, and scientists worry that others may die off, too.

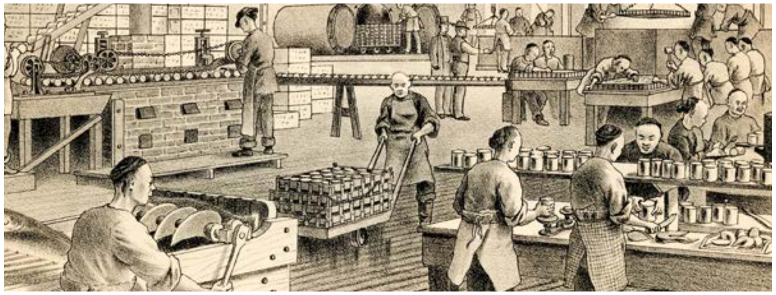
Legend has it salmon once were so thick in some Columbia tributaries that you could cross from one riverbank to the other by walking on their backs. In the 1850s, Washington settlers said two men with a boat and a net could catch 1,200 pounds of salmon in one night. At that time, some 10–16 million adult salmon returned to the Columbia each year to spawn. Today, a tiny fraction of that number return. What happened?

Settlers and Salmon

Native Americans of the Columbia River Basin lived on and *with* the salmon for thousands of years. White settlers did things differently than the Indian tribes. As soon as the settlers arrived, they began to change the salmon's habitat, always in ways that hurt salmon.

First, they removed giant clusters of logs from the rivers that salmon had long relied on for shade and protection. Next, the settlers started logging the forests, which in turn sent dirt into the rivers. Salmon need clear, cool, rocky beds to lay their eggs in. The dirt choked and destroyed their spawning beds. Later, the invention of the chainsaw and bulldozer let people log the forests faster, only making matters worse.

Three loggers pose atop giant trees in 1905.



Engraving of an 1880s illustration of a salmon cannery in Astoria, Oregon, at the mouth of the Columbia River

Farmers' widespread use of pesticides and fertilizers to keep insects away and grow bigger crops polluted the water. **Irrigation** for crops took water from streams and left little for fish.

Fishing—or rather, overfishing—hurt Pacific salmon, too. When a type of fish is taken so often and in such great numbers that there aren't many left, that fish can go extinct. Once the canneries were built, they could preserve the fish for longer travel. That meant fishermen could catch as many fish as their nets could hold without fear of their spoiling before they were sold. Canned salmon was shipped everywhere.

By the 1860s, fishermen caught millions of pounds of fish each year, especially salmon. The Chinook salmon taken from the Columbia peaked in 1883 at almost 43 million pounds. But in the 1900s, those numbers began to drop. Then the dams arrived.

The Rise of Dams

Today, dams are the greatest threat to salmon survival. Fishing—both ocean and in-river—kills far fewer salmon. The dams have destroyed thousands of fishing jobs by killing millions of fish.

One hundred years ago, there were no dams on the Columbia. Today the main stem of the river has fourteen dams, with three in Canada and eleven in the United States. Including its tributaries, the river system holds more than 400 dams. Some produce **hydroelectric power**; some do not. Some are humble in size; others are huge.

More than anything else, these dams have caused the salmon's decline. Here's why: During their life cycle, salmon have to travel downstream as **juveniles** and return upstream as adults. Dams work against salmon swimming in either direction.

H is for Humans

Do You Know?

Today salmon are at risk for a variety of reasons, but the biggest ones can be broken into three categories. All begin with H: habitat (the decline of the salmon's home), harvest (overfishing), and hydroelectric power (dams). In each case, humans are responsible.

Ladders for Fish?

By leaping up a series of low steps, adult fish are able to climb past the dams. The amount of water falling over the steps has to be enough to attract the fish to the ladder. But it can't be so much that it washes fish back downstream or exhausts them so that they can't continue their journey upriver.

The obvious problem is the dam itself. Adult salmon returning upstream have to find a way past each dam that stands between them and their birthplace. When engineers built the dams, they built many with fish ladders so adults could return to spawn where they were born. Fish ladders are a great invention, but some salmon fail to find them. Others fall back down from above the dams.

The less obvious—but worse—problem caused by each dam is the water backed up behind it. Where a river once ran, each dam creates a **reservoir** in its place.

Salmon understand how to navigate rivers because the water in creeks and rivers is always moving downstream. Adults heading upstream lose their way in the reservoirs because the water is slack—it has no current for them to follow. Juveniles coming downstream have it far worse. During their journey to the ocean, juveniles used to get a big boost when they were washed downstream by spring snowmelt. Since reservoirs have replaced the river behind dams, what once was a week's trip to the ocean now takes thirty days. As fish drift without a current, some fall ill and die. Others are caught in the dams' turbines.

These reservoirs also breed **predators**. Although native to the Columbia, pikeminnow love the still, warmer water created by dams. So do certain non-native fish. Both groups have a taste for juvenile salmon. In one reservoir alone, these fish are estimated to eat 2.7 million juvenile salmon each year, with pikeminnow taking most of them.

The dams kill far more juvenile salmon migrating to the ocean than adults migrating from it. Of course, there are more young salmon to kill. The ones that never make it to the ocean will never make it back again.

Spending to Help Salmon

People want to save the salmon. Just in the five years between 1997 and 2001, federal, state, and Native American governments spent $1.5 billion on efforts to save the salmon. Programs are in place to control water pollution, overfishing, and mobs of pikeminnow as well as to promote healthy salmon habitat. People even give barge rides to juvenile salmon headed downstream.

Here's how barging works: At certain dams, the government collects millions of juveniles out of the river. The young fish are shot through pipes into barges (boats with flat bottoms) that carry them downstream. Below the last dam, the government dumps them back in the river.

Thousands of young steelhead salmon are released to start their journey to the ocean.

By 2005, upwards of 90 percent of the juvenile salmon in the Snake River—the Columbia's largest tributary—were barged. That number has dropped to less than 50 percent since 2006. Why? Because it turns out that salmon barged below the dams die at a greater rate than those that make their own way through the dam system.

Instead, some dams have been spilling extra water to help the juveniles downstream. When water spills over the dams, fish spill, too. That means fewer fish are collected, and fewer are barged. Spilling water for salmon means less water for hydroelectric power. But sending fish over the dams instead of around them actually gives juveniles a higher rate of survival.

Just as barging once seemed like a great idea, Congress funds **hatcheries**—at a cost of $80 million a year—to breed and raise fish. When the fish are old enough, they're released into rivers. The goal is to replace the miles of salmon spawning grounds that were blocked or flooded behind dams.

Hatcheries multiply the number of salmon born each year. What's more, because there are no predators in hatcheries and food is easy to come by, more young salmon survive in the hatchery than would in the wild. But hatcheries create their own set of problems.

How a Hatchery Works

People capture salmon returning to spawn in hatcheries or in rivers and streams. They collect the salmons' eggs and watch over them. Once the eggs hatch, people place them in holding tanks to grow and develop. When the fish are old enough, they are released into the river. If they make it to the ocean, they'll spend the next 1–3 years there, then return to the hatchery or spawning grounds.

For starters, hatchery fish aren't considered truly wild. Because their early lives are easier than those of salmon spawned naturally, they're less fit, less experienced, and therefore less apt to survive compared to wild fish. They're also more prone to illness. Maybe worse, they compete with wild salmon and even prey on them. Scientists still question whether hatchery programs help or threaten the survival of wild salmon. And some people argue that hatching more fish just throws millions more into a system that could end up killing them.

Critics say that the steps being taken to keep Columbia River salmon alive have grown as unnatural as the changes to their habitat. Maybe worse, critics say these steps don't solve the root problem. The real problem, they argue, is the dams.

Tourists on a paddle wheel riverboat wait to move upriver as the lock fills at Bonneville Lock and Dam on the Columbia River.

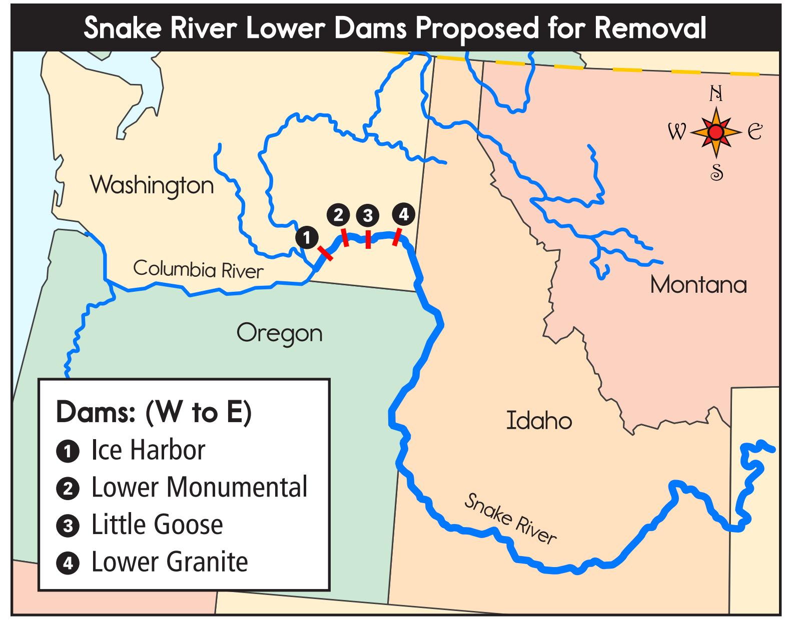
What's So Great About Dams?

The dams were built for a reason, of course. Dams do a lot of great things. They allow the passage of ships and help control floods. These are problems that the first settlers in the Northwest were forced to face many times. Thanks to the dams, more inland areas can send their products (such as wheat and paper) down the river to seaports and beyond. Other products can make their way upstream.

Dams provide water for one of the largest irrigation projects in the western United States. The project sends water to over half a million acres of rich but dry lands in central Washington. Thanks to the river water, the area's farms grow important crops such as apples, corn, potatoes, hops, beans, and sugar beets.

When Bonneville Dam was built in the 1930s, the dam was a disaster for Native Americans who lived upstream. Others welcomed the cheap electricity that the dam helps provide.

The Columbia is a great source of hydroelectric power as well. The fourteen hydroelectric dams on the Columbia and the many more on its tributaries generate more hydroelectric power than those on any other North American river. Today, customers in the Pacific Northwest enjoy some of the cheapest electricity in the country, as do high-tech companies like Google. The dams don't pollute or contribute to global warming either, but all these benefits come at a price. Much of that price has been paid by salmon, which have been driven to the point of extinction.



Taking Down Dams

Since the salmon have been listed as endangered species, pressure to do something about the dams has grown. Spilling water has helped salmon, but people still talk about taking out dams—maybe not all of them, maybe not most of them, but some. The dams that seem to generate the most talk are four on the Snake River. Together, those four dams create one long stretch of slack water for about 140 miles. That water makes it tough for salmon to migrate both upstream and downstream. Scientists say that allowing the lower Snake River to flow naturally is the best way to bring back the salmon.

Dam removal is not unheard of, especially in the Pacific Northwest. Marmot Dam on Oregon's Sandy River was removed in 2007, making it a free-flowing river from Mount Hood glaciers to its mouth at the Columbia River for the first time in ninety-five years.

Taking down the dams is pretty simple. The reservoirs would be drained; the rivers would run again. But removing those four dams worries people in the area for a number of reasons.

Members of the environmental group "Save Our Wild Salmon" gather at Bonneville Dam in 2004.

They fear the loss of cheap power to the Pacific Northwest. They fear that the lost power would be replaced by forms of energy that would worsen air pollution and global warming. They fear that removing those dams would hurt the area's economy and its farmers, leading to thousands of lost jobs.

Are they right to be afraid?

People who want to remove the dams don't think so. They say that with careful planning, electricity bills, pollution, and spending on saving the salmon can all actually come down along with the dams. They explain that removing the dams can lead to new jobs. They explain how farmers can find other ways to get their crops to market and other ways to get water for irrigation as well. The two sides argue back and forth.

What Does "Endangered" Get You?

Meanwhile, scientists have known for decades that the Pacific Northwest's salmon are in trouble. Every type left in the Columbia River Basin is listed for protection under the Endangered Species Act and has been for years.

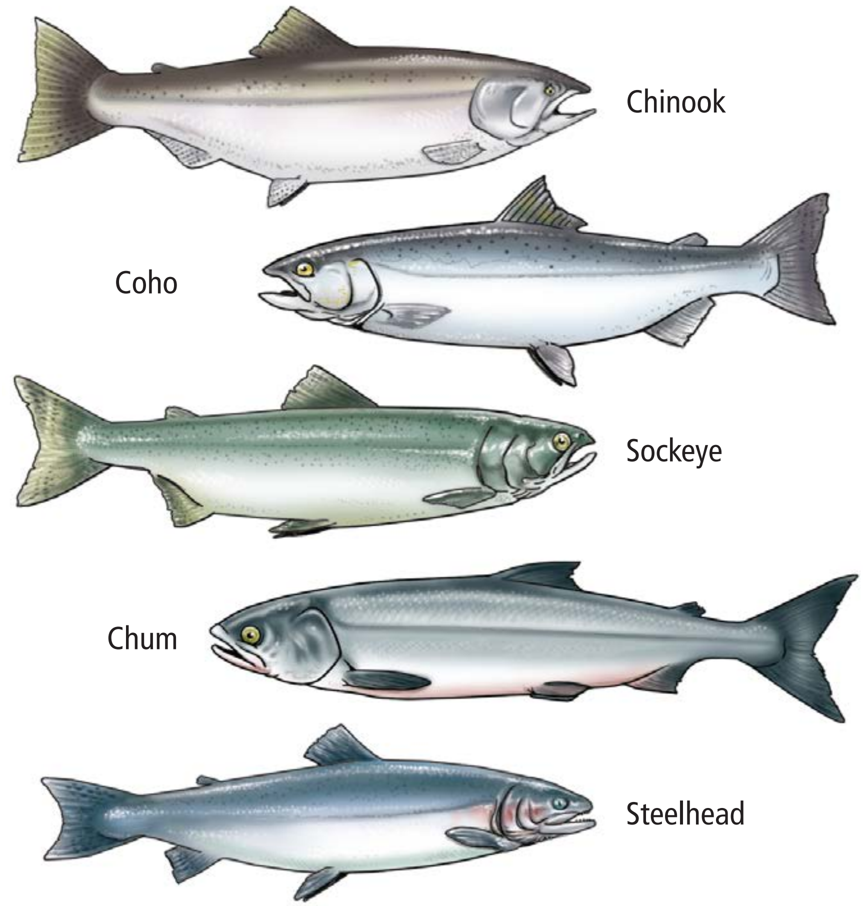
One of the most important ways the Act can protect species is by protecting their habitat, since a species cannot survive without a home. But the habitat of Columbia River salmon underwent huge changes before the fish were ever listed for protection. So while some argue about how to protect the salmon's habitat, others insist that the real question ought to be how to *restore* it.

Save That Species!

Endangered species are plants and animals that exist in small numbers and may be lost forever without quick action to stop their decline. In 1973, Congress passed the Endangered Species Act (ESA) to protect those animals most in danger of extinction in the United States. The Endangered Species Act says people must act on the "best available science" in order to save those species. It can be a powerful law to have in your corner.


Thanks to the ESA, the bald eagle and other species have been saved.

Salmon Species of the Columbia River Basin



According to scientists, the best course of action to save the salmon is to take out some dams. According to the Endangered Species Act, if the best science says dams should come down, then dams should come down. But when money and politics are involved, science sometimes gets pushed aside. When that happens, species like the salmon get pushed aside, too.

Conclusion

Some people say it's a waste of time to talk about whether to pull down the dams. They say most people don't care enough about the fish to tear them down.

So far, this seems to be the case. And so far, a few salmon still make it back to the bend in the river where they were born. They lay their eggs before they die so their whole amazing story can begin again.

So far, salmon remain a living legend. If people care enough, salmon can stay that way, instead of becoming the sort of legend that starts, "Once upon a time."

Glossary

extinct *(adj.)*	no longer in existence; completely wiped out (p. 7)
hatcheries *(n.)*	places where animals are raised from eggs (p. 14)
hydroelectric power *(n.)*	electricity produced when moving water turns turbines that are connected to generators (p. 10)
irrigation *(n.)*	the practice of supplying water to land or crops to promote growth (p. 9)
juveniles *(n.)*	young people or other animals that have not reached maturity (p. 10)
migrate *(v.)*	to move from one habitat or region to another at a certain time each year (p. 5)
native *(adj.)*	natural to an area (p. 8)
predators *(n.)*	animals that hunt and eat other animals to survive (p. 12)
reservoir *(n.)*	a large tank or lake used for collecting and storing water for human consumption or agricultural use (p. 11)
spawn *(v.)*	to make and lay eggs (p. 5)
species *(n.)*	a group of living things that are physically similar and can reproduce (p. 7)
tributaries *(n.)*	rivers or streams that flow into a larger river (p. 6)