

# Fish Passage in the United States

## Making way for the nation's migrating fish

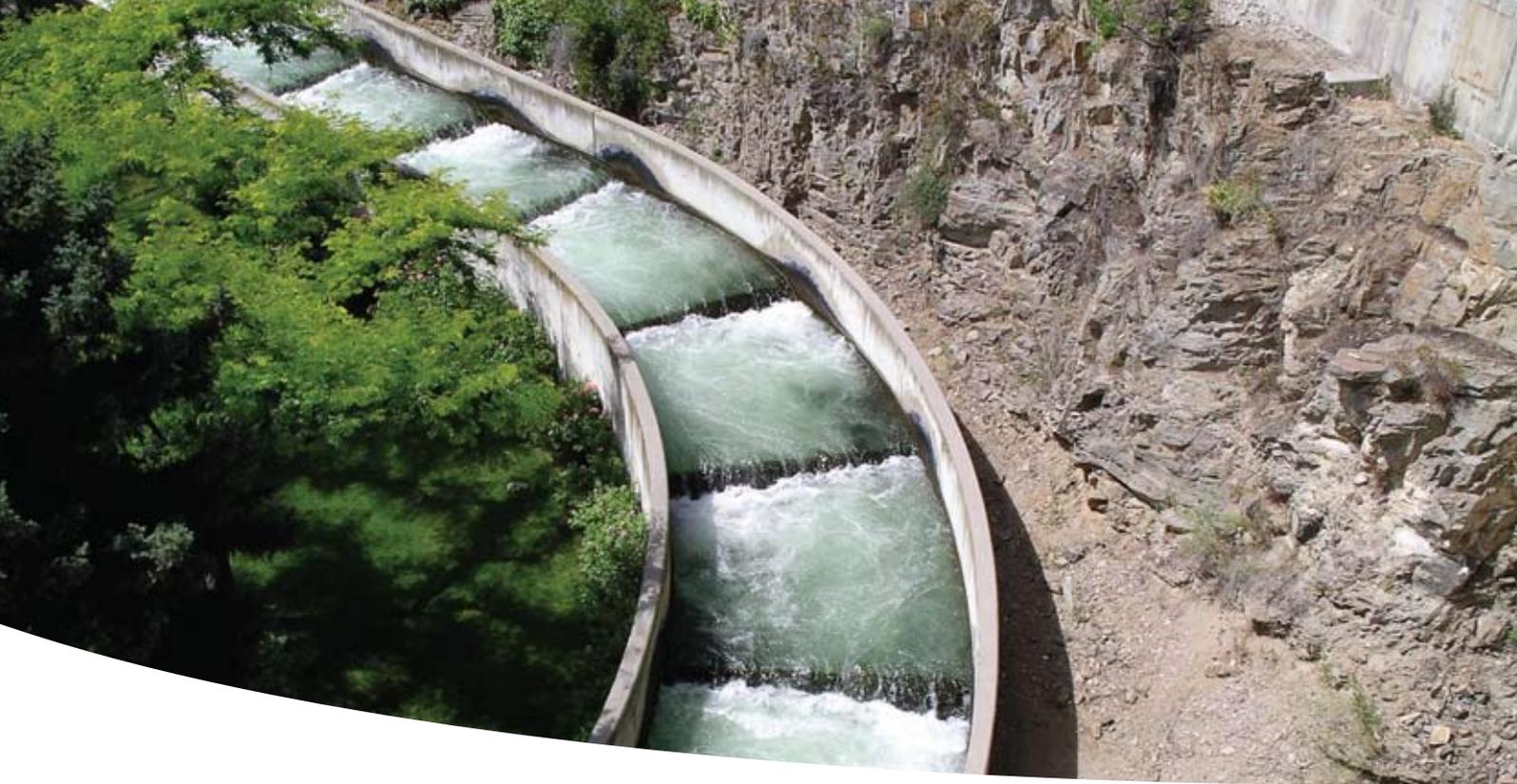


NOAA

**NOAA**  
**FISHERIES**  
**SERVICE**

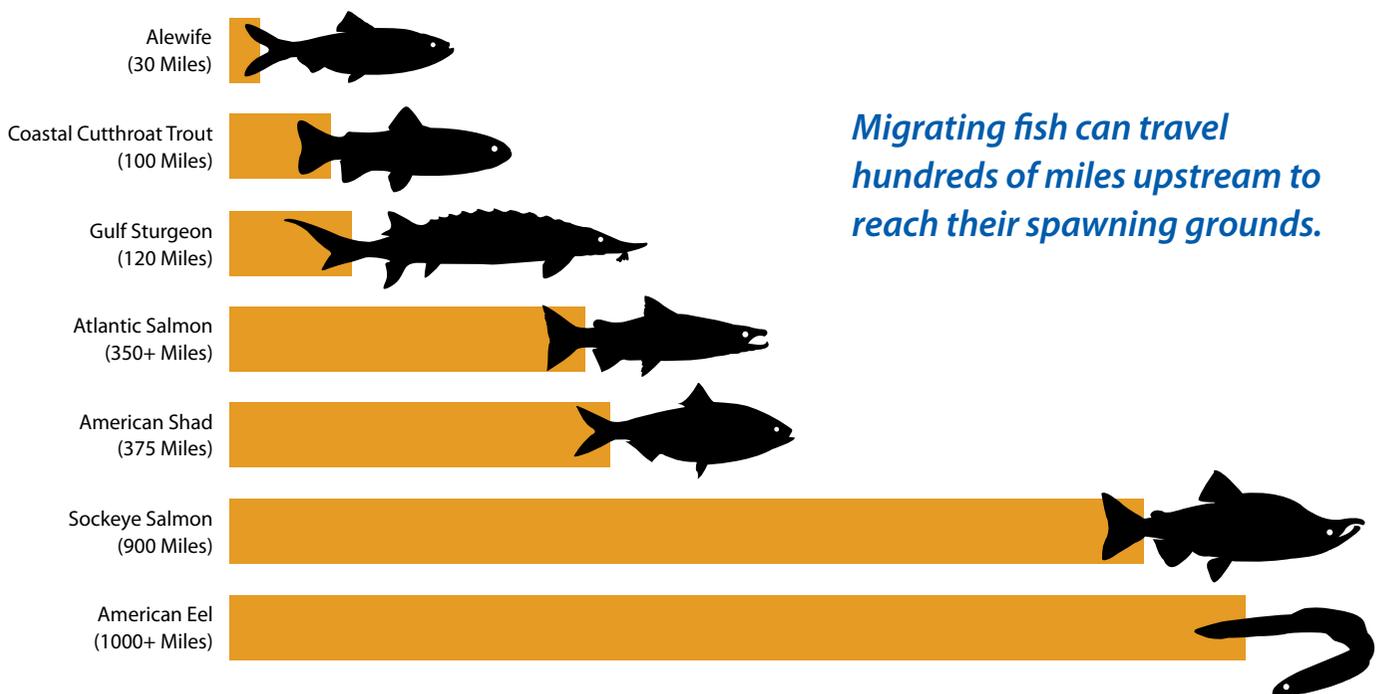
*Science, Service, Stewardship*





## Incredible Journeys

Salmon and other migrating fish, such as shad, alewives and sturgeon, need access to freshwater habitat for spawning and rearing young. In some cases, these fish need to swim thousands of miles through the oceans and rivers to reach their destination. Unfortunately, they are often blocked from completing their journey by more than two million man-made barriers that exist in many rivers and streams across the country.



**Vision:** Restore and protect the ecological health of the nation's rivers and streams by increasing habitat for fish, conserving native species and striking a balance between nature and the needs of people.



### **Removing the Brownsville Dam**

In 2007, NOAA supported the Brownsville Dam removal on Oregon's 72-mile Calapooia River, a tributary of the Willamette. Built to power a mill 150 years ago, the dam was a significant barrier to steelhead and Chinook salmon. In addition to environmental impacts, members of the Brownsville community were concerned about dam maintenance and the potential for flooding and accidents at the site. NOAA will soon help remove the Calapooia's last remaining barrier, Thompson's Mill Dam, and the river will once again flow freely, allowing endangered salmon unrestricted access to their historic spawning grounds.



### **Opening Historic Habitat on the Broad River**

On the Broad River in South Carolina, NOAA worked with the owners of the Columbia Hydropower Dam to install a state-of-the-art fish ladder. This project reopened 24 miles of historic river habitat for sturgeon, shad, striped bass and herring for the first time in 200 years. NOAA worked cooperatively with the state, conservation organizations and industry partners in planning and building the fish ladder around the dam, helping restore the Santee Basin's migratory fish populations, while continuing to generate hydropower for local communities.



### **Bridging the Gap for Fish and Road Culverts**

In 2007, NOAA worked with California's Trinity County and local organizations to replace a culvert on Little Brown's Creek that not only blocked the passage of Coho salmon and steelhead, but caused chronic flooding in nearby communities. Today, a new bridge spans the river, representing a safer option for people and opening upstream fish habitat for the first time in decades.

***More than two million barriers block fish from more than 600,000 miles of rivers and streams.***

## NOAA is delivering lasting results

- In the past 12 years, NOAA provided more than \$14 million and leveraged an additional \$39 million in partner funding to remove dams, replace culverts, and install fish ladders.
- NOAA funded and provided technical assistance to more than 300 fish passage projects around the country since 1996.
- In 2006, NOAA negotiated fish passage at two major hydropower projects—the Klamath in California and the Santee Cooper in South Carolina—opening over 650 miles of historic river habitat to migratory fish.
- NOAA engaged nearly 6,000 citizen volunteers who gave 38,000 hours to help implement fish passage projects since 1996.

## NOAA's Vision for the Future

### Restoring watersheds and economic growth

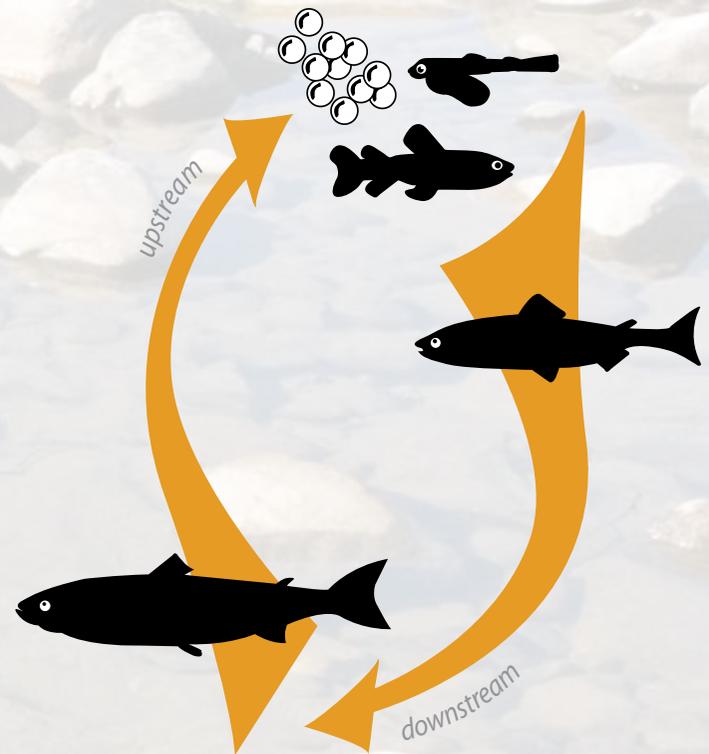
The damming and diversion of free-flowing rivers and streams result in habitat fragmentation and fewer routes for aquatic species migration. NOAA uses all of its fish passage tools to provide solutions for migratory fish at both small barriers and large dams, producing ecological, social and economic benefits on the local and watershed scale.

### Improving federally-protected species

Increased pollution in rivers and streams weakens the natural survival mechanisms of native species, which are crucial in completing the long journey upstream and downstream. NOAA collaborates with conservation partners to protect and restore habitat so that threatened and endangered species can thrive in the future.

### Supporting smart energy production

As human populations continue to grow, so do the demands for energy resources. Through hydropower dam relicensing, NOAA works with industry and other partners to improve outdated dam designs and operations—updating these dams to modern environmental standards. NOAA's work leads to improved river flows and fish passage around hydroelectric dams while still maintaining energy production.



*Adult salmon live in the ocean and swim upriver to spawn and rear young.*



## NOAA's approach to river restoration

Fish passage is important to the protection and restoration of fish and their habitats. The National Oceanic and Atmospheric Administration (NOAA) works with conservation organizations, energy companies, states, tribes and citizens to evaluate barriers — big and small — to improve fish passage. Most barriers have the same general impact on fish — blocking migrations — but each requires a specific set of conservation actions.

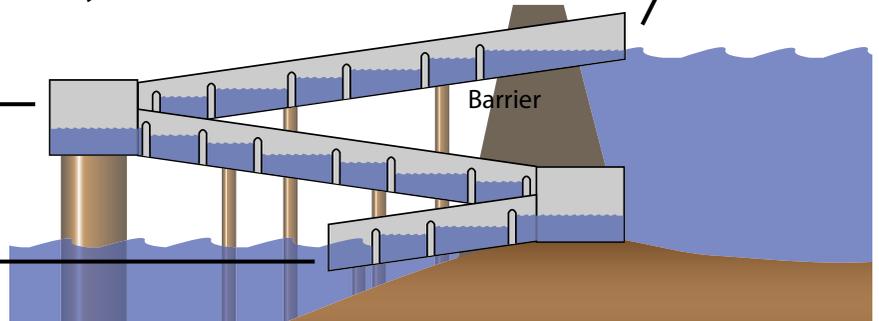
Through programs such as the Open Rivers Initiative, the NOAA Restoration Center has been able to open rivers and streams for fish and hundreds of other species by completely removing fish passage barriers. At the same time, the NOAA Fisheries Hydropower Program provides solutions for fish passage around hydroelectric dams — some of the largest dams in the United States. Together, NOAA programs have opened thousands of river miles with benefits to riverine, coastal and marine ecosystems.

The ladder is designed to mimic the natural feel of swimming upstream.

After making their way through the ladder, fish re-enter the river upstream of the barrier.

Ladders allow fish to swim up smaller inclines rather than trying to pass the barrier in one high jump.

Fish enter the ladder through an opening just below the low water level at the base of the barrier.



## Striking a balance



**Water.** Our nation's landscape is complex, comprised of diverse freshwater and marine habitats and a wide array of species. From Maine to Florida and from Washington to southern California, vast rivers and tributaries are intrinsic to the health of areas both inland and around our coasts – contributing to our fisheries and supporting millions of jobs.



**Fish.** The United States has some of the world's richest river systems, supporting dozens of migratory fish species, which travel between ocean and river habitat to breed. As river barriers block their migrations, many fish, such as Atlantic salmon and Gulf sturgeon, are threatened or endangered. These species are critical in connecting marine and freshwater food webs and ecosystems; are vital to recreational and commercial fisheries; and significantly impact local economies.



**People.** Fish passage benefits people. For generations, people all across America, including Native American tribes, have relied on fish migrations as a source of food and economic support. In the 1800's it was common to haul in fish by the ton. In 1884, one fishery recorded harvesting five tons of American shad in the lower Roanoke River in a three-week period. Annual shad harvests have dropped from 20,000 tons in 1900 to less than 1,000 tons today.

## NOAA is building partnerships

NOAA has achieved lasting conservation by collaborating with a range of agencies, organizations and thousands of citizens. By leveraging the strengths of our partners and supporters, we are able to achieve our greatest successes.

Many thanks to our partners:

American Rivers, Association of National Estuary Programs, California Conservation Corps, California State Coastal Conservancy, Ecotrust, FishAmerica Foundation, Gulf of Maine Council, Gulf of Mexico Foundation, Hydropower Reform Coalition, Lower Columbia River Estuaries Partnership, National Association of Counties, National Fish and Wildlife Foundation, Restore America's Estuaries, The Nature Conservancy, Trout Unlimited, U.S. Department of Transportation, U.S. Forest Service, U.S. Fish and Wildlife Service, U.S. Geological Survey, U.S. Department of Agriculture Natural Resources Conservation Service, and many state and local agencies and tribes.

## Taking action

NOAA is leading the charge to open our nation's rivers and streams by providing fish passage solutions to obstacles that stop fish from traveling to their natural spawning grounds. By 2010, NOAA plans to remove 60 dams and culverts and install fish ladders around many hydroelectric dams.

NOAA's Office of Habitat Conservation serves the American people by protecting, restoring and promoting good stewardship of our nation's coastal habitats. To request more information about NOAA's fish passage programs, please visit us online at [www.nmfs.noaa.gov/habitat](http://www.nmfs.noaa.gov/habitat).

**Credits:** Photos by Craig MitchellDyer; Keith Plummer; Christine Jordan; iStock.com. Graphics by Milena Viljoen.