

Fish Fate—Major Reasons Salmon Are in Trouble

Since 1991, at least 26 runs (specific populations) of salmon in the Pacific Northwest, excluding Alaska, have been listed as endangered or threatened under the Endangered Species Act. (And four more runs are candidates for listing.) In general, salmon species that spend a larger proportion of their lives in fresh water are in greater trouble than those that spend less time in fresh water. And the salmon that spawn in southern states are in more trouble than those that spawn further north. (For example, salmon in Alaska are doing better than salmon in California.)

The following list discusses some of the major reasons that salmon are in trouble.

1. Commercial and recreational overfishing have historically posed a major threat to salmon by removing too many wild salmon from natural populations. Fortunately, both types of fishing are now regulated, but overfishing is still a problem for some salmon populations.

2. Aquaculture (fish farm) operations, if not regulated properly, release wastes that can harm salmon by washing into waterways and decreasing oxygen supplies. Wastewater from these operations can also carry antibiotics and other pollutants. Escaped farm-raised fish (which are typically Atlantic salmon—even in salmon farms on the West Coast) can spread diseases to wild fish and may compete with wild populations for food and spawning areas. In addition, sea lice and other parasites are a problem for many farmed fish. When wild fish swim near a fish farm, those wild fish can pick up parasites that pose a significant threat to their survival.

3. Dams are one of the biggest causes of salmon decline. There are more than 1,000 dams obstructing the flow of water in Washington alone. By slowing and changing natural water flows, dams can lead to an inadequate water supply downstream, raising water temperatures and allowing too much silt to collect. Hydroelectric dams can block fish from moving upstream to spawn, and they can reduce the number of juvenile salmon that successfully migrate to the ocean. Even dams with fish ladders can create problems for salmon. Adults may have difficulty negotiating them, becoming disoriented or injured in the process. And juveniles can easily become caught in the turbines if they don't use the fish ladders while moving downstream.

Dikes prevent coastal flooding by reducing the size of flood plains or preventing tidal surges from the sea. Estuaries, where rivers meet the ocean, are primary habitats for young salmon to mature, feed, and adjust to salty, ocean water. Squeezing salmon populations in shrinking estuarine habitats can be extremely detrimental to salmon populations. When a dike is built between the ocean and the estuary, the lack of salt water quickly kills off salt-water dependent marsh fish (such as salmon, herring, and perch) and invertebrates (such as clams and mussels); this die-off, in turn, decreases the amount of food for marsh birds. The absence of salt water also causes the vegetation to shift dramatically from salt grasses to freshwater plants.

4. Forestry operations can create problems for salmon. Removing trees can lead to increased water flow across the surface of the ground, increasing erosion and subsequently allowing more silt to wash into the stream. Removing trees and other plants that grow along streamsides can also reduce stream shading and cause water temperatures to rise. And clearing of forests right up to the stream banks deprives the stream of large trees that would otherwise fall into the streams and provide crucial fish habitat. In the last 50 years, two-thirds of the old-growth forests in the state of Washington have been logged. Those forests were particularly important elements in keeping streams healthy for salmon as they provided essential shading and cover.

5. Farming and ranching may also remove vegetation that shades the stream or that would otherwise end up in the stream and provide fish habitat. Farming and ranching operations may channel streams and drain wetlands, drastically changing the flow of water that is needed by salmon. In addition, when livestock are allowed access to streams, they can destroy banks and stream bottoms, increase the amount of silt in streams, contaminate the water with their droppings, and destroy fish-nesting sites. By removing water for irrigation or livestock watering, farmers and ranchers can change stream flows. In addition, pesticides and fertilizers that wash off agricultural lands may poison fish or reduce oxygen supplies.

6. Mining for gravel is another threat to salmon because it destroys streambeds, disturbing spawning grounds and causing increased water flows.

7. Expansion of cities and housing developments across the land is another major source of problems for salmon. Humans are competing for the same water and land that are essential for the preservation and productivity of healthy wild salmon populations. People have altered natural water courses, eliminated or degraded wetlands, cut down trees, and introduced toxic chemicals—particularly petroleum products, lawn and garden chemicals, sewage, and air pollution byproducts—into waterways. Loss of the estuarine wetland habitat, which is essential for healthy salmon populations, has been especially extensive.

8. Hatcheries can also harm salmon, even though they were originally developed to boost salmon stocks. These facilities take salmon eggs and sperm from adult salmon, hatch the eggs, and raise the young. Then they release the young into streams. However, sometimes these successful “progeny” are returned to the hatchery and unknowingly bred together, which can create salmon that are unfit to survive in the wild. Today, hatcheries are usually careful to use eggs and sperm from parents that are well adapted to the stream in which they will be released. This was not the case in the past, which led to the release of fish that were less able to survive in the wild. Hatchery fish may carry diseases that affect wild fish, so that threat is monitored now too. And sometimes hatchery fish don't return to their own streams. Instead, they end up in streams far from their origins. When this happens, they interbreed with wild fish and reduce the wild fish population's ability to survive. Commercial and recreational fishers catch many hatchery-raised salmon. Because those fish don't end up returning to salmon streams, they don't die in the streams and, subsequently, replenish the nutrient supplies in the streams.

9. Invasive species not native to the Pacific Northwest—including *Spartina* grass, zebra mussels, Chinese mitten crabs, European green crabs, and Eurasian millfoil (an aquatic plant)—are spreading through the region and altering salmon habitats. For example, *Spartina* grass has already spread across 6,000 acres in Washington, crowding out the eelgrass that provides important rearing habitat for young salmon.

10. Natural predators, such as seals, sea lions, and seabirds, now exist in numbers that are out of proportion to the numbers of salmon they prey upon. Salmon and their predators have coexisted for centuries, but salmon populations have come under stress from many sides, reducing salmon numbers and causing an unnatural predator-prey balance.

11. Global warming, many scientists believe, may cause exceptionally high sea temperatures at lower latitudes, which will force salmon and other fish to move north if they can.