Our Fish Story

Idaho Power's Fish Conservation Program





Water



Since 1916, water provided Idaho Power customers with low-cost, clean hydroelectric energy. And for longer than that, it provided some of the best fishing in the country.

Some people, though, wonder if the two uses can live together. While there are many complex challenges involving dams and electricity generation and the impacts they have on the health of the northwest fisheries, Idaho Power remains committed to environmental stewardship to maintain balance between energy generation and protection and enhancement of Snake River fishery resources.





Idaho Power's Fish Conservation Program

Development of Chinook Salmon

1. Green Eggs

8. Spawning Adult

Eved Eggs

Adult

In 1955, Idaho Power began construction of the most ambitious engineering effort in its history—the three-dam Hells Canyon Complex (HCC) on the Snake River. According to the federal license that was issued for the project, Idaho Power was mandated to preserve the anadromous fish (fish that spawn in fresh water, migrate to salt water to reach adulthood and return to freshwater to spawn) runs that would be affected by this hydroelectric development.

To comply with the mandate, the company launched an experimental program using traps and trucks to ferry the salmon and steelhead around the dams. The plan had the cooperation of everyone involved except one very important group—the fish. Smolts, on their way downriver from their spawning beds, could not or would not swim through Brownlee Reservoir to the trap above Brownlee Dam. The slack water was like a wall and the tiny salmon and steelhead could not climb it.

The company, along with federal and state fishery officials, agreed upon a

simple, yet revolutionary idea –develop a hatchery program to transfer the Snake River's natural salmon and steelhead runs to the undammed Salmon River, the Snake's largest tributary. Years later, the plan would expand to include releases of salmon and steelhead in the Snake River below Hells Canyon Dam. Idaho Power hoped that the hatchery program would mitigate for the loss of upstream runs associated with construction of the Hells Canyon Complex and continue to provide a resource to the people of the Northwest.

The government agencies approved the plan and the ambitious hatchery program began.

The new program required the construction of four fish hatcheries. Fully funded by Idaho Power, the hatcheries were, and continue to be, staffed and operated by the Idaho Department of Fish and Game. It's a substantial investment for the company but the program yields large gains in its ability to release millions of salmon and steelhead into the Snake and Salmon rivers and their tributaries each year.



Swim-Up Fry

5. Fingerling/Parr





How Our Hatcheries Work

Our hatcheries focus on maintaining abundant salmon and steelhead populations for the purpose of providing harvest opportunities to both recreational anglers and traditional Native American fishers. Our hatchery program relies on returning hatcheryorigin adults that can be captured and artificially spawned to produce the next generation of fish.

After capture, adult fish are held in large holding ponds until they are ready to be spawned. The females' eggs are harvested, fertilized and incubated using leadingedge techniques to maximize egg viability and disease control. Once the eggs hatch, the young fish are reared and fed at the hatcheries in large raceways or ponds until they are ready to be released back into the rivers where they can migrate to the ocean to live and grow.

Oxbow Hatchery

Located downstream from the Oxbow Dam powerhouse at the mouth of Pine Creek, the Oxbow Hatchery is a holding and spawning facility for adult steelhead migrating up the Snake River above its confluence with the Salmon River. Steelhead are collected in a trap at Hells Canyon Dam, and are held to maturity at Oxbow then stripped of their eggs.

Slightly more than one million eggs are fertilized and go through their first stages

of development here. They are delivered to the Niagara Springs Hatchery to hatch and grow for approximately 11 months before they are ready for release into the Snake below Hells Canyon Dam.

Spring Chinook salmon that return to Hells Canyon are also held at Oxbow for a short time but then are transferred to the company's Rapid River Hatchery for spawning.

In 2000, Idaho Power added raceways to rear up to 200,000 fall Chinook salmon for release below Hells Canyon Dam. The company also funds the production of an additional 800,000 fall Chinook salmon at a non-Idaho Power Company hatchery located in Oregon. Each year, a combined total of up to 1,000,000 juvenile fall Chinook salmon are released into the Snake River below Hells Canyon Dam.



Rapid River Hatchery

Tucked within a tributary of the main Salmon River near Riggins, Idaho, the Rapid River Hatchery is the largest collection, spawning and rearing facility of spring Chinook salmon in Idaho. It has the ability to produce 3 million juvenile spring Chinook salmon annually.

Juvenile spring Chinook salmon spend almost two years at Rapid River. They grow to a length of four to six inches and are then released for their 45- to 60-day, 600-mile journey to the ocean. At this point, the juvenile salmon are referred to as smolts. One to three years later, as adults, they return to the hatchery ready to spawn. While in the ocean, they grow



two to three feet longer and 15 to 20 pounds heavier.

As the returning adults fight their way back to Rapid River, they are collected at a man-made barrier near the hatchery. They are transferred to a holding pond until it's time to gather and fertilize the eggs. In roughly two years, long after these adults have died, the cycle begins again with the release of their offspring into Rapid River, the Little Salmon River and the Snake River below Hells Canyon Dam. Of those released, about one-half of one percent can be expected to make it back to Idaho as adults.





Pahsimeroi Hatchery

The Pahsimeroi River slides through a peaceful valley near the east central Idaho town of Challis. The hatchery once specialized in only steelhead, but in 1981 raceways and ponds were built for raising Chinook salmon. Today, approximately one million smolts are released into the Pahsimeroi River each year.

For steelhead, the Pahsimeroi Hatchery is used as a maternity ward. Over one million eggs are collected, fertilized and developed to the point at which they can be handled safely, then transferred to the Niagara Springs Hatchery where they are raised to the release stage-six to ten inches. Eleven months after arriving at Niagara Springs, the smolts are returned to the Pahsimeroi River for release.

Niagara Springs Hatchery

The Niagara Springs Hatchery, located in the Hagerman Valley of southern Idaho, is one of America's largest privatelyowned steelhead rearing facilities with a production goal of nearly 2 million smolts annually. Named after the spring that feeds it, the hatchery's water is warmer than that in which naturally spawned steelhead grow up. This ideal environment allows the fish to achieve the equivalent of two year's growth in just one year.

Conditions at Niagara Springs are strictly controlled. When eggs arrive from the Oxbow or Pahsimeroi hatcheries, they are disinfected, placed in incubators and remain there until they have hatched and developed into fry approximately one inch in length. They are later transferred to large, concrete raceways where they are fed a special, high nutrient diet. Hatchery workers monitor bacterial and viral levels and maintain strict standards of cleanliness.



When they reach release size, the fish are placed in 5,000 gallon steel tank trucks and transported to release sites in the Snake, Little Salmon and Pahsimeroi rivers. The water temperature in the tanks is lowered to slow the fish's metabolic rate allowing them to be transported with minimal stress.

The Niagara Springs Hatchery has proven to be a tremendous asset in the rearing of juvenile steelhead. In the wild, less than 5 percent of the eggs hatch and survive to migrate to the ocean. At Niagara, more than 80 percent of the eggs received from Pahsimeroi and Oxbow hatcheries survive to make their ocean journey.

Activities At Idaho Power Hatcheries

Oxbow Hatchery

Trap adult steelhead
Spawn adult steelhead
ncubate steelhead eggs
Ship steelhead eggs to Niagara Springs
Trap adult spring Chinook
Haul adult spring Chinook to Rapid River
ncubate fall Chinook eggs and fry
Rear juvenile fall Chinook in raceways
Transport fall Chinook smolts for release

Niagara Springs Hatchery

Receive steelhead eggs Incubate steelhead eggs and fry Rear juveniles in vats (indoor) Rear juveniles in raceways (outdoor) Transport steelhead smolts for release



Pahsimeroi Hatchery

Trap adult steelhead Spawn adult steelhead eggs Incubate steelhead eggs to Niagara Springs Trap adult summer Chinook Spawn adult summer Chinook Incubate summer Chinook eggs and fry Rear juveniles in vats (indoor) Rear juveniles in ponds (outdoor) Release summer Chinook smolts

Rapid River Hatchery



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Today, Idaho Power has a large staff of aquatic scientists who study fish, tiny snails and aquatic insects. They study the biology of these organisms as well as their habitat needs to determine how different flow levels from Idaho Power dams affect these habitats. The company has also developed programs for monitoring the quality of the water in the Snake River. Water quality affects habitat needs of fish and insects. The monitoring program tracks water quality relative to the standards and criteria established to maintain the various organisms that use the river.

Times Are Changing

Idaho Power's Fish Monitoring Efforts

We are proud of our hatchery program and the added value we are able to bring to Native Americans, anglers and people of the Northwest. In addition to providing fish for harvest, surplus broodstock captured at our hatcheries are donated to food banks and Native Americans for subsistence and ceremonial purposes. Idaho Power shares any excess eggs from its hatcheries with state and federal agencies to maintain existing hatchery programs in Idaho and throughout the Northwest.

The HCC license was issued over 50 years ago and the hatchery program is still central to the fish conservation program at Idaho Power. However, the world has changed and Idaho Power's recognition of additional fish conservation needs has followed suit.

We've expanded the program to include stocking of catchable-sized rainbow trout in many Snake River locations from American Falls to C.J. Strike Dam. In addition, Idaho Power also recognizes the affects of operating the HCC on natural populations of salmon, steelhead and other species of fish downstream of the HCC that call the Snake River home.

Lastly, Idaho Power is committed to achieving a greater understanding of the affects the HCC has on warm water fish, white sturgeon, bull trout and other aquatic species. Idaho Power is taking measures to ensure these will be around for future generations.

Steelhead

Warm Water Fish

Warm water fish such as bass, crappie and catfish were introduced into the Snake River early in the 20th century. Construction of reservoirs, such as Brownlee, Oxbow and Hells Canvon created large areas of habitat ideal for these fish populations to thrive-and thrive they have.

Brownlee Reservoir is now one of the top locations in Idaho that anglers come to seek quality fishing. However, there are multiple demands on the reservoir. From regional flood control to flow augmentation for anadromous fish downstream to electricity generation, these demands require that Brownlee Reservoir experience large seasonal draw downs in water

level, especially in the spring and summer months.

Idaho Power factors warm water fish into the mix of considerations as part of balancing these multiple demands on Brownlee Reservoir. Through 10 years of research to understand the spawning period and habitats used by warm water fish, the company now secures a 30-day window each spring to protect spawning habitat. In addition, Idaho Power biologists continue to monitor these populations to understand long-term population trends as they relate to changing environmental factors.







Bull Trout Monitoring

While bull trout is in the trout and salmon family it is not a true trout. It is the only member of the char family (genus Salvelinus) that is native to the state of Idaho. It was originally classified by taxonomists in 1856 as a trout under the name Salmo spectabilis. It was later grouped with Savelinus malma which goes by the common name Dolly Varden. In 1980, it was recognized as its own species, separate from Dolly Varden, based on its geographical distribution and physical characteristics and acquired the name it has today—Salvenilus confluentus—or commonly called bull trout. Dolly Varden are mostly associated with coastal rivers, whereas bull trout are found in the interior of the Northwest, and into Montana. In the early 1900's, the Eastern brook trout (Salvelinus fontinalis), also a char, was introduced into the Northwest from their native range in the Eastern United States. Eastern brook trout have done well in Idaho and are now distributed in many of the same areas that bull trout occupy. Their physical appearance and spotting pattern is similar to bull trout making it difficult for anglers to distinguish between the two. They can also apparently confuse each other, because they often spawn together in areas where their populations overlap. This has caused problems in some areas, where brook trout have entirely replaced bull trout.

Bull trout are a federally protected species and important to the states of Idaho and Oregon. They are managed by the United States Fish and Wildlife Service, the Idaho Department of Fish and Game and the Oregon Department of Fish and Wildlife. Idaho Power is working with these agencies in the Hells Canyon area to develop a population monitoring program and a bull trout passage program for those populations potentially affected by the HCC. The company is also monitoring the potential effects that fluctuating river flows may have on bull trout that spend the winter in the Snake River below Hells Canyon Dam.

Fall Chinook Salmon

Fall Chinook salmon are one of three races of 'King Salmon' that enter Idaho waters. They arrive in Idaho during late summer and into the fall and spawn primarily in the Snake River during the late fall months from late October to mid-December.

Fall Chinook salmon spawning habits can be impacted by water level fluctuations in the river. If water levels change, the shallower spawning nests (called redds) can be exposed to air and the eggs or fry will dry up. In 1990, Idaho Power initiated a flow program at the HCC that creates a stable flow during spawning and protects the redds throughout the entire period of incubation. This practice ensures that the fish have a stable environment for spawning and that the developing embryos are protected during the entire incubation period. Idaho Power also monitors the number and locations of redds constructed each year by conducting weekly helicopter flights and searching deep water areas that cannot be observed from the air using underwater video cameras.

Idaho Power biologists have also been studying fish entrapment for several years. Entrapments occur when fish are caught in isolated pools of water, often near the shore as water levels fluctuate in the Snake River. Young fall Chinook salmon are especially vulnerable to











entrapment as they occupy near shore habitats to feed and grow. The company has worked closely with the National Marine Fisheries Service to develop protocols for the operations of Hells Canyon Dam. These protocols ensure entrapment pools are reconnected to the main river on a daily basis before water temperatures become too warm. This process allows the fish to continue to grow and migrate downstream when the time is right.



White Sturgeon

White sturgeon are a primitive bottom-dwelling fish. They are the largest freshwater fish in North America and can weigh as much as 1,500 pounds and reach lengths over 12 feet.

White sturgeon spawn in large rivers in the spring months, usually in areas of fast, deep and turbulent water. They can spawn multiple times within their life span with some larger females producing several million eggs with each spawning.

Over the past century, the effects of overharvest and habitat alteration and fragmentation through river regulation have significantly reduced population numbers. Today, many sturgeon populations are land-locked because of the presence of dams. Dams have negatively impacted sturgeon by altering large river habitats and creating migration barriers, often blocking access to critical habitats such as spawning areas. In the Snake River, dam construction has also fragmented what was once a contiguous large population of white sturgeon into several smaller populations between dams resulting in isolated sections of river that do not have all of the necessary habitats to support a reproducing population.

> In Idaho, the two largest reproducing populations of white sturgeon are found below Bliss and Hells Canyon dams while only small

numbers of fish exist in the remaining reaches. It's for these reasons that Idaho Power developed a white sturgeon conservation program that focuses on monitoring the health of Snake River white sturgeon populations from Shoshone Falls downstream to the Hells Canyon reach of the Snake River. The white sturgeon conservation plan allows the company to share this information with fish management agencies and cooperatively identify measures that can be taken to improve or maintain populations of this great fish.



White Sturgeon





Is the Idaho Power Fish Conservation Program Working?

Idaho Power's hatchery program has contributed significantly to the popularity and growth of steelhead and salmon fishing in Idaho. The Idaho Department of Fish and Game estimates that anglers buy more than 55,000 tags each year to test their skill at catching a powerful steelhead. Chinook salmon fishing, although it occurs on a more limited basis, is also a very popular recreational opportunity thanks in part to our hatchery program. Warm water and trout fisheries in our reservoirs continue to provide quality recreational experiences to people of all ages. Our expertise not only in anadromous fish populations but other Idaho fish such as bull trout and white sturgeon continues to serve Idahoans and the Northwest—anglers, fish managers and other environmental interests alike.

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Our fish conservation program remains focused on balancing environmental stewardship and recreational opportunities with reliable and efficient hydroelectric operations.



For more information, please visit www.idahopower.com/fish.



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