

Wildlife Express!



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Let's look at Steelhead

One of Idaho's most popular fish is the steelhead. The head of a steelhead is not harder than that of any other fish. It gets its name from the brilliant silver color it has while in the ocean. Idaho's steelhead spend much of their lives in the Pacific Ocean. Steelhead are **anadromous** which means they travel from the rivers where they were born to the ocean where they feed and grow. Then they **migrate** back to where they were born to reproduce.

The steelhead is called *Oncorhynchus mykiss* (*ON-core-ink-us MY-kiss*) by scientists. It is very similar to Idaho's three native salmon species. They are the chinook (or king), the sockeye and the coho. All of these are also anadromous.

A steelhead begins its life in an Idaho stream or river. It will hatch from an egg and leave its gravel nest, called a redd, in springtime or early summer. It stays in the stream eating insects like caddisflies, mayflies and stoneflies. Two to four more springs will come and go. Then, like its salmon cousins, a steelhead will get the itch to travel to the ocean. It is six to eight inches long when it begins this long journey and is now called a smolt.

The steelhead stays in the ocean one to three years. The longer it stays in the ocean eating shrimp, squid, anchovies and herring, the bigger it will grow. If it spends one year in the ocean, it will weigh about four to six pounds. If it stays two years in the ocean, it will weigh ten to 14 pounds. Three years will help it pack on 20 pounds or more!

The urge to spawn brings it back to Idaho. After the long trip back to Idaho from the ocean, a steelhead will spawn. After spawning, most steelhead will die, but not all of them. This is what makes a steelhead different than all other Pacific salmon, which die soon after spawning. Some steelhead will live after spawning and make another remarkable journey back to the ocean. Few will ever make the return trip to Idaho once more. This trip, which can be 900 miles long, is too demanding.

Although the anadromous way of life is a tough one, these fish have been very successful with their life style. Salmon and steelhead have been making this journey from Idaho to the Pacific Ocean and back for at least 10,000 years. As with many species, humans have had impacts on salmon and steelhead that now threaten their way of life. Steelhead in the Snake River system were listed as "threatened" under the Federal Endangered Species Act in 1997. Under this act "threatened" means they are in danger of becoming "Endangered". The next step, "Endangered" means at high risk of extinction. In any event, there aren't many wild steelhead left in our rivers and streams.

Dams, pollution, and loss of habitat have all contributed to the decline of wild salmon and steelhead populations, which began with settlement of the west about 150 years ago. Four dams on the lower Snake River represent the major problem facing salmon and steelhead today. Dams make it very difficult for the young smolts to get to the ocean. Fisheries biologists continue to work on new ideas to help wild steelhead populations. Maybe some day their journey will be easier. But traveling 900 miles will never be too easy. It's a good thing these fish are tough!

What is a Fish?

A steelhead is an animal with a backbone (vertebrate), that breathes through gills, has fins and lives in water. That makes it a fish, right? That seems pretty simple, but in nature, things aren't always as easy as we would like them to be. Take the backbone for example! We know what a backbone is because we have one and so do dogs and cats and elephants. In the fish world, not all backbones have been created equal! Sharks and sturgeon have a backbone made of the same stuff that supports your nose and ears! It is called cartilage (KAR-til-ij).

All fish breath through gills, right? They have to because they live in the water. Once again...not so fast. Some fish actually have lungs. In fact, the African lungfish is so dependant on breathing air above the water's surface that it will "drown" if kept under water! The Australian lungfish can survive out of water for months by digging a mud burrow that stays moist during the dry season. Lungfishes are examples of fish that break the "gill rule".

We usually think of fish as having paired fins- that is fins on each side of their bodies. But what about lampreys? Lampreys, those eel-like critters that live in Idaho streams, don't have paired fins, or jaws, and they are fish. In fact, lampreys represent some of the first freshwater fishes to appear on earth. So as you can see, a simple job like defining what a fish is, is not so simple. Fish have been on our planet for 450 million years, so they have had some time to adapt to many diverse underwater (and even out of water) habitats.

Idaho has about 43 species, or different kinds, of native fishes.* Native means that these fish have always lived here and have long adapted to diverse habitats in our rivers, streams and lakes.

Idaho (like every other place in the world) also has some non-native, or introduced species. These are fish that were brought here either by accident, or in some cases, on purpose. Sometimes these non-native fish can compete with native fishes for the same habitat. Steelhead are native to Idaho and have been here for about 10,000 years! since the last ice age.

* We use "fish" for one species and "fishes" when referring to more than one species.



Somewhere Over the Rainbow

Most of us have probably heard of a rainbow trout. They are among the most well-known and widespread fish species in the world. Rainbow trout are very common in Idaho and fishermen love to catch and eat them. But did you know that a rainbow trout and a steelhead are actually the same fish? Both of them are called *Oncorhynchus mykiss* by scientists. What makes them different is how they behave! Do you know some kids who love to get in the car and go? They will travel just about anywhere and get antsy when they are at home? Other kids are "homebodies". They prefer to hang out around the house and get tired of jumping in the car and leaving home.

That is one way to explain the difference between steelhead and rainbow trout.

The steelhead is the traveler. Scientists call them anadromous, because they spend part of their life in the ocean. Because the steelhead goes to the ocean for a few years and bulks up on the seafood buffet, they get pretty large. Some returning steelhead can weigh 25 pounds.

The rainbow trout is the homebody, called a **resident** fish. It doesn't migrate to the ocean. It spends all of its life in Idaho's waterways and going to the ocean never crosses its mind, or instinct! Since rainbows don't go to the ocean for the seafood buffet, they have to settle for a less diverse diet and don't grow nearly as large.

So the obvious question is, "can you tell a rainbow trout from a steelhead?" No, not really! They both have a red or pinkish line along the side of their body which is how they got the name rainbow. They both have black spots on their entire body. They both have the same number of fins in all the right places. But remember, steelheads have had a better diet so they are generally larger. Fisheries biologists call them steelhead if they are 20 inches or longer *and* if they are in a place where a steelhead could be. Some rivers have been blocked by dams and some just never had steelhead.

This definition is mostly to help fisherman. If you caught a small *Oncorhynchus mykiss* in a place where rainbow and steelhead both live you really couldn't tell which one you've got. So it's not an exact science but in the fish world, there are lots of exceptions to lots of rules.



Going, Going, Gone

Imagine you are a steelhead! Would you think it's more difficult to travel to the ocean or to travel back from it? Most people think that the return journey is more difficult because the fish are swimming against the current. Surprisingly it is the journey to the ocean that kills more fish. But let's start at the beginning.

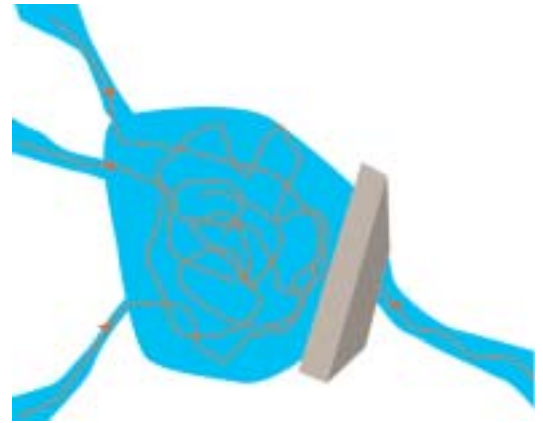
Idaho's anadromous fish, those that spend some time in the ocean, begin their lives in cold, clean streams and rivers. Some of these fish travel as far as 900 miles to the Pacific Ocean. They don't all leave at the exact same time but they do head out in the springtime between April and June. When these fish head down Idaho's streams and rivers they are called smolts and are usually between four to eight inches long. The journey to the ocean is **with** the current. Rivers in the spring are running high with snowmelt from the mountains and this runoff delivers the water **and the smolts** to the ocean. Even though it might be a "downhill" trip, it's not as easy as you might think.

The smolts are too small to swim all the way to the Pacific. They depend upon the current to carry them there. There are plenty of predators like osprey, herons, and other fish looking for an easy meal and they take their share of the smolts. The spring rains add some soil to the water. Muddy waters help the smolts hide. Smolts also travel at night, especially when there is no visible moon. They use all the strategies they can to get to the ocean safely. So while predators will get some smolts, this is not the greatest danger they face. Time is their greatest threat! How can that be? What used to be a two-week ride to the ocean now takes much longer. Some smolts may not get there at all!

Why? We have added dams to the rivers. Dams slow the flow of the water and the fish it carries. Dams create giant pools or **reservoirs** behind them. It's much easier to paddle a canoe down a river than across a big lake, right? Well, smolts get slowed down by these reservoirs making their perilous journey longer and more difficult than before. Instead of two weeks, it may take smolts up to eight weeks to reach the ocean. This change in *timing* has made all the difference to our salmon and steelhead populations. Many smolts will die with this extra time on their hands. They may get confused in the reservoir with the lack of current and become an easy meal for a predator. They may run out of energy, or they may not be able to get ready for the new environment that awaits them.



Of course, many smolts do get past the dams. Some pass over the spillway, an area of the dam that allows water to pass. Others are **barged** past the dams. This means they are gathered into large boats (barges) and kept in water until the boats travel past the last dam where they are released to finish the trip to the ocean. Once a smolt gets to the ocean, it begins a new life of continuous swimming and feeding. It will be one to three years before it returns to Idaho.



On the Road Again

Just when our steelhead was getting comfortable in the ocean, it gets this urge to head back home to where it was born. Leaving those big ocean buffets behind won't be easy, but the urge to spawn is too strong to ignore. Steelhead smolts that survived the journey to the ocean in the spring of 2000 don't all spend the same amount of time in the ocean or return in the same year. Nature decided long ago that this wasn't a good idea. If all the smolts from the year 2000 decided to go back to Idaho in 2002 and there was a terrible disaster, like a flood or severe drought, few would survive. Nature doesn't like to put all its eggs in one basket or steelhead in one returning group. So some steelhead will return after one year in the ocean, while others may return in two or even three years. It's nature's safety net.

The returning steelhead must once again adjust to freshwater. The returning fish also have to swim upstream, no floating with the current like they did as smolts. But these fish have grown strong and powerful from their time in the ocean and are up for the challenge. Remember, the longer a steelhead stays in the ocean the longer it eats at the "ocean buffet" and the bigger it gets

They are certainly strong enough to swim 900 miles and climb more than 6,000 feet in elevation. But how do they find their way home? Well, would you believe they smell their way back? Each wild steelhead can find the exact stream in which it was born. We call that the home river. They smell the water along the way. The adult steelhead remembers the smell of the downstream trip it made as a smolt. Each stream that enters a river is tested and the steelhead only follows the path that it recognizes. Hatchery steelhead, in a similar way, trace their way back to the place where they were released.

Once home, these fish will spawn and continue the cycle all over again. Most will die after spawning but remember, some steelhead, unlike their Pacific salmon relatives, will survive to make one more journey to the ocean.



Returning steelhead smell their way home.

Gone Fishin

Sport fishing is one of America's favorite pastimes. Thousands of Idahoans head to the lakes, streams, and rivers of our state in the hopes of spending relaxing time with family and friends. Of course, there is always the hope that you will land a big fish for supper.

No fish brings greater expectations than a B-run steelhead on an Idaho river in the fall.

If you catch a steelhead, you will probably know it by the red to pinkish line along its side, its black spots and its size. Don't look for the slate gray colored "steel head" which was common in the ocean. Once this fish leaves the ocean, its head loses the gray color and turns green. The "steely" color is good camouflage in the ocean but not rivers and streams.

Once you have determined you have a steelhead, you need to decide whether to keep it or not! Wild steelhead are threatened. If you catch one of those, you must return it to the water. Steelhead that are raised in hatcheries are being released for people to catch. How do you tell the difference between a wild fish and a hatchery fish? It's the case of the missing fin!

Adipose Fin



Before a steelhead leaves a hatchery to be released, it gets the adipose fin clipped. This small fin sits atop the steelhead and in front of the tail. Steelhead

swim fine without it so losing it does not hurt its chances for survival. If you look at your steelhead and it has no adipose fin, you can keep it and have a fine meal. Don't forget to look for the fin, and remember, "If it has a fin, it goes back In."



Hatchery worker tending to steelhead eggs

Hatchery Fish

Wild steelhead are a threatened species. This means that without a comeback or recovery, they may one day become endangered or extinct. Pollution, habitat loss and habitat modification all contribute to the lower numbers of steelhead. Dams change the habitat dramatically. Dams built within the last 50 years represent the biggest obstacle to salmon and steelhead recovery.

As wild steelhead numbers declined, there were fewer steelhead for fishermen to catch. This was not popular with anglers. They wanted more fish to catch. One solution was to “create” more fish! This was done through the start of a hatchery program. Most hatchery programs are started with wild fish. The adults are trapped and spawned. The eggs hatch and the young fish are raised in hatcheries, usually in long concrete troughs called raceways. They are fed well and protected from predators.

When the young steelhead are ready to head to the ocean, they are released in the river to make their downstream journey. If they survive all of the challenges that await them, they will return as adults to the hatchery where they were raised.

The idea behind our hatcheries is to always have enough returning adult fish to keep the hatchery running and to provide the “extras” for anglers. Hatcheries have worked fairly well for this purpose. The more returning steelhead, the happier the fishermen!

So, while Idaho fish hatcheries are helping solve the problem of too few steelhead for fishermen, they are not solving the problem of too few *wild* fish. They were never meant to.

Only by living in the wild can animals **be** wild. Wild steelhead have been coming and going in Idaho for about 10,000 years. They have long learned the tricks of the trade for surviving in the natural world. Tricks like hiding from predators, migrating at night, eating the right foods and changing colors to match the background. It's the wild fish that are best adapted to life in the wild. So, although hatcheries are important for the part they play, we must save our wild fish if we hope to see steelhead fill our rivers and streams again.

A Home Run

When salmon and steelhead leave the ocean to head for home, they often do so in large groups. Fisheries biologists call this movement of fish a “run”. A fish run can include several groups of fish headed for different places or it could be a particular group headed for a particular place.

There are two runs of steelhead in Idaho. Idaho's steelhead are classified into two groups based on the amount of time spent in the ocean and when the adults return to freshwater. A-run steelhead are typically 23 to 26 inches long and return between June and August each year. Because A-run fish spend less time at the seafood buffet, they are generally smaller and weigh between four to six pounds. Most A-run steelhead in Idaho are found in the Snake and Salmon Rivers.

Steelhead that remain in the ocean longer are called B-run steelhead. A good way to remember the B in B-run steelhead is “big” or “beastly!” Their average weight is between 10-14 pounds and they reach more than thirty inches in length. The B-run fish of the Clearwater River are famous for their size and are some of the largest steelhead in the world! The Idaho record steelhead was a B-run fish. It was 30 pounds and about 40 inches long.

Although we always think of the Clearwater when we talk about B-run steelhead, there are B-run fish in the Middle Fork and South Fork Salmon Rivers, too. B-run steelhead are bigger than A-run steelhead because they spend more time in the ocean. Their migration home begins later in the year than A-Run steelhead, usually in August or September. So that's another way to help you remember. In the alphabet, A comes before B and in steelhead, the A's return before the B's.

Small Fish—Big Challenge

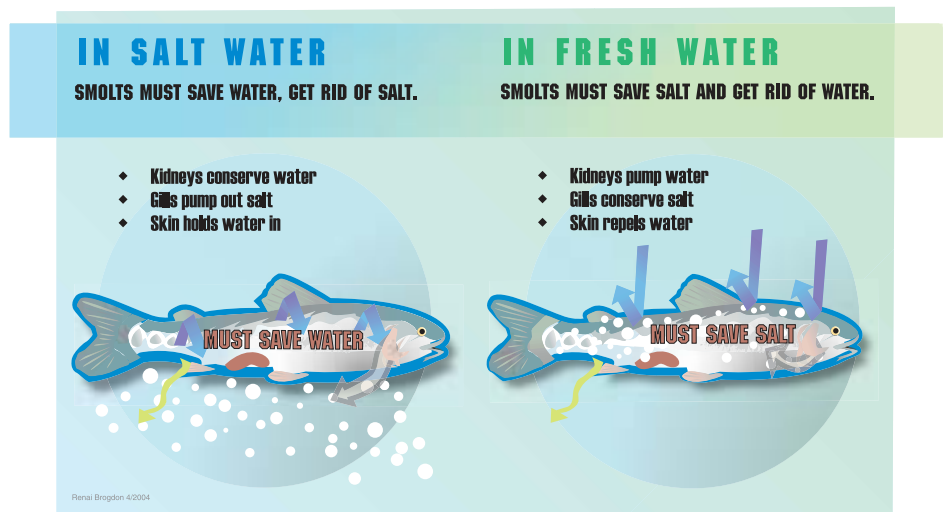
Have you ever been to the ocean? If you have swum in the ocean and opened your mouth, you've gotten a taste of just how salty ocean water is. Steelhead smolts that travel down Idaho's rivers and streams have spent their entire early life in freshwater. How do they handle this big change? To get their bodies ready for living in saltwater, steelhead go through something called **smoltification** (smolt-i-fi-CA-shun). Smoltification gets the fish ready for the big salt bath they are about to take.

Salt is a good thing. We all need it, but we need it in the right amounts. The salt and water in our bodies must stay balanced. There is some salt in freshwater too, but not very much. In freshwater, smolts still need to gather and hold on to salt. Their gills, kidneys and skin all help them do that. They pass a lot of water out of their bodies while holding onto salt.

In the ocean, the situation is reversed. Here the smolts have to do the opposite of what they did in freshwater. They need to filter the freshwater out of the ocean water and pump out the salt.

The big switch happens as smolts are traveling to the ocean. It only takes about two weeks for them to change from freshwater loving smolts to saltwater loving smolts.

Not only is that amazing, it is critical. If smolts can't make the adjustment in this two-week time, they die. This is the main biological reason that salmon and steelhead populations have been reduced in the last 50 years. Dams have disrupted the migration of smolts to the ocean so much that most of them are no longer able to make the big switch.



Fisherman with a "B" run steelhead.



WE HOPE YOU ENJOYED
LEARNING ABOUT ALL
THESE ANIMALS IN
WILDLIFE EXPRESS. SEE
YOU NEXT YEAR.

WILDLIFE EXPRESS

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WE WOULD LIKE TO HEAR FROM YOU !

If you have a letter, poem or question for Wildlife Express, it may be included in a future issue! Send it to the address printed above!

Express Yourself!

*There once was an Idaho Steelhead
Who was born in a gravel bed
When it got the notion
It swam to the ocean
And soon became well fed.*

-Sarah Steele, Rainbow Elementary