

## A new front in the fight to save steelhead

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On a cloudy spring morning at North Vancouver's Seymour Hatchery, a line of volunteers forms up between the smolt pools and a pair of five-ton tanker trucks.

One volunteer sweeps a large net through the tanks, and soon the men are passing the heavy net along the line again and again. It's teeming with hundreds of slapping, wriggling juvenile steelhead, each only a few inches long.

Ordinarily, these steelhead smolts would be released into the Seymour River, mimicking their natural early life. But ordinarily, of the 10,000 fish being released, fewer than 100 survive to return to the Seymour as adults. So today the Seymour Salmonid Society is trying something different.

Instead of going by river, these smolts will ride down to the shore in the trucks. Some will be released at the mouth of the river, and others will be loaded onto a barge at Cates Park -- still in their tanker truck -- and towed west at a stately two knots.

During the trip, the tanker will slowly replace the hatchery's fresh water with the seawater of Burrard Inlet. As the salinity rises, the fish will begin smolting, a series of changes to their organs and colouring that prepare them for life in the ocean. After acclimatizing to the salt water, the steelhead will be released near Point Atkinson.

The other truck will drive directly to West Vancouver and release its passengers without acclimating them to the seawater.

Giving these young fish a ride past the river mouth is an experiment. The Seymour Salmonid Society, as well as several other organizations involved in the project, hopes giving them a lift will nudge their survival rate up out of the basement.

"We're very excited to be doing this," said Brian Smith, hatchery manager. "We're the only people in the province doing this. It is an experiment, so we're not totally sure how it will work out, but we are well organized, so I'm optimistic."

All 10,000 fish are distinctively clipped on their cheeks, so the adults that do return to the Seymour can be identified and counted. One hundred and fifty of



CREDIT: NEWS photo Mike Wakefield  
Brian Smith (second from left) oversees the loading of a steelhead-laden tanker truck onto a Mercury Launch barge. The slow voyage from Cates Park to Point Atkinson allows the team gradually to introduce seawater to the tanks, initiating the smolting process.

the smolts have acoustic tags surgically implanted in them. These tags can be detected by a line of off-shore sensors, so Smith and his colleagues should know in early fall how many fish reached the ocean.

This year's project builds on a small-scale experiment the hatchery conducted in 2008, when 30 tagged steelhead were released in the river mouth and another 30 off of Point Atkinson. Of the river fish, three were detected in the northern Georgia Strait and one as far as the Queen Charlotte Islands. Encouragingly, seven of the marine-release steelhead were picked up in the strait and three near the Queen Charlottes.

The team hopes this year's production-scale effort will produce more data and more adult fish.

Steelhead are relatives of both Pacific salmon and rainbow trout. They live up to nine years and unlike salmon can return home to breed more than once. One of British Columbia's most prized sport fish, steelhead are tough fighters and can have a wide range of coloured bands on their bodies. Although angling is a factor in the steelhead's decline in other river systems, such as the Skeena, it is unclear what is impacting Seymour stocks. Anything from predators to rocks to disease may be behind the problem; the goal of the Seymour project is to grasp at least some of the local variables.

"The marine survival of salmon and steelhead has declined substantially over the past 15 years," said Al Lill of the B.C. Living Rivers Foundation, who was on hand for the release. "We're looking at why that takes place, where that takes place. That's what the tagging process is about. The Seymour guys spend a lot of time and energy for a year raising these fish and the survival rate is less than one per cent. If we can get that up to two or three per cent, that makes a huge difference. We can raise fewer fish or we can get way more fish for the same money. Either way that's a good thing.

"By knowing where the high mortality of newly released smolts is taking place, we might be able to develop strategies to increase marine survival at Seymour and elsewhere where smolts are being transported for release into the wild, usually from a hatchery, but also around obstructions such as the Cleveland dam on the Capilano River."

Half of the fish have also been vaccinated against common waterborne diseases, in hopes of pinning down one more variable in this complex system.

Transporting smolts safely downriver isn't a new idea, said Lill. Live fish are regularly barged down the heavily dammed Columbia River in the United States, and researchers have carried a small number of fish down the Keogh River on Vancouver Island in nets. But marine release is a new concept, as is the project's multi-faceted approach.

The early migration data comes from POST, the Pacific Ocean Shelf Tracking project. The non-profit organization operates several lines of acoustic sensors that stretch from Baja California to the Bering Sea, and monitors the movement of more than a quarter of a million sea creatures.

Stephen Vincent is vice-president of the Seymour Salmonid Society, described by his colleagues as "the numbers guy."

"It's only recently that this technology has been available," he said. "In previous years we would just release the fish into this big black box called the ocean and hope to one day be reunited with them two or three years down the road."

Steelhead cross two listening lines in the course of their migration, one in the

northern Georgia Strait and one near the Queen Charlotte Islands. Each fish has a unique code, allowing Vincent to determine which groups have been most successful: river versus marine release, acclimated or not, vaccinated or not. Previous studies have shown the tagging process itself does not influence the fishes' survival rate.

"I used to fish for Coho in the Strait of Georgia," Vincent said. "I've seen the survival rate for all these species just go off a cliff. In the 1980s, ocean survival was around 15 per cent. Now it's one per cent or lower. This is below replacement levels. If action isn't taken these fish will be extirpated."

Preventing this from happening is a team effort, and a quick glance around during the steelhead loading confirms this. The Seymour Salmonid Society bred the fish. The B.C. Freshwater Fisheries Society supplied the tanker trucks. B.C. Living Rivers is picking up the tab for the barge, and helping the Pacific Salmon Foundation fund their use of the POST system. The University of B.C., the provincial environment ministry, the federal department of fisheries and Metro Vancouver all had a hand in bringing this project to fruition.

Because so many of the contributions are in kind or volunteer labour, both Smith and Lill struggled to quote a budget for the steelhead project. But the acoustic tagging alone comes with a \$60,000 price tag.

"We are non-profit," Smith said. "So fundraising is something we have to do every year. We're always going to Living Rivers, Pacific Salmon Foundation, our corporate donors -- anyone and everyone who can give us money. A lot of our funders are sunset bodies, so we have to keep looking each year."

"It's a partnership in every case," agreed Lill. "You have to get a number of organizations together with a common interest. All of us have to work together because funds are so tight. That's how things get done in fisheries these days."

Regardless of the POST figures, the proof of this experiment will be in the number of today's smolt that return to the Seymour River as mature steelhead to breed. Before that, each fish faces two or three years at sea, tracing a huge loop for thousands of kilometres around the northern Pacific Ocean. It's unknown whether marine release affects a fish's ability to find its way back home.

"Fish do wander," Lill said. "Colonizing new streams helps them survive when conditions are bad in one spot. Steelhead aren't all that wandersome, but it will be interesting to see how many end up in the Capilano or Lynn Creek."

"The ocean is vast," he added. "There's only so much we can do, but it's important we learn as much as can about what happens in the Georgia Basin."

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