

## Life support for salmon

### Restoration program yielding slow, but encouraging results

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Shelbi Candage (R), a sixth-grader from Brooksville Elementary School, releases some of 170 young Atlantic salmon into the West Branch of the Union River in Amherst. Bangor Daily News/ Gabor Degre

**By Kevin Miller**  
Bangor Daily News

BRADLEY - A misty rain added bite to the morning air as fish biologist Fred Trasko, standing on the muddy banks of the Penobscot River, watched some of his hard work fly away in the talons of a hungry osprey.

Maine's two federal fish hatcheries are sometimes described as the life-support system for the few wild Atlantic salmon waterways remaining in the U.S.

If so, Trasko and his crew from the U.S. Fish and Wildlife Service's Green Lake Fish Hatchery were emergency room doctors this chilly, May morning as they gave the Penobscot a transfusion of nearly 40,000 young salmon.

The opportunistic osprey, meanwhile, represented one of the countless perils awaiting the young fish - not to mention a hint at why Maine's effort to save the Atlantic salmon is such a frustrating and costly affair.

Moments before, thousands of juvenile salmon, known as "smolts," had been swimming in holding tanks on the back of a government truck when gravity sucked them into industrial hoses draped over the steep riverbank. The silvery, 6-inch fish glistened momentarily as they shot from the hose before splashing into the Penobscot.

Trasko and his crew had spent more than a year raising these and roughly 550,000 other salmon smolts, which were released into the Penobscot watershed this spring in hopes that a few will return years later to seed a new generation.

Enough adults have come back to the Penobscot in recent years to convince state officials to allow the first salmon angling season in Maine since 1999. The 30-day, catch-and-release season opens today near Bangor.

But that morning in early May, Trasko just shrugged as he watched the osprey snatch an easy meal compliments of U.S. taxpayers.

He knew most would eventually suffer similar fates.

Those fish that do not fall prey to cormorants, smallmouth bass or other natural predators face pollution, fishermen and other man-made obstacles as they make their way toward the Atlantic Ocean. Once there, the smolts' odds of survival plummet even lower for reasons that biologists are struggling to understand.

Statistically, just one or two of every 1,000 smolts released into the Penobscot will return years later to spawn, according to biologists. With each smolt costing taxpayers about \$1 to raise, that's a return of less than a penny per dollar.

Sadly, most other New England salmon stocking programs would be pleased with such a high return on investment.

Which begs the question: Is it worth it?

Officials at Maine's two primary salmon hatcheries - Green Lake outside of Ellsworth and Craig Brook in East Orland - evidently field that question often because they quickly respond with a startling statistic.

More than 90 percent of the adult salmon returning to U.S. waters annually can be traced to Maine's hatchery programs. So without Maine's restoration effort - and the millions of public dollars it takes to run it - where would the salmon be, they ask rhetorically.

"These two programs are the only things keeping Atlantic salmon in the United States," Green Lake's manager, Paul Santavy, said with an air of proud resignation as he strolled through the massive facility. "Right now, we're just keeping these fish from going extinct."

## **Salmon once abundant**

Early settlers to New England would likely have scoffed at the suggestion Atlantic salmon stocks would ever be depleted. After all, the fish were so plentiful that some bragged you could cross a river on the backs of spawning salmon.

While such tales are clear exaggerations, as many as 400,000 salmon are estimated to have returned to New England rivers annually until human activity began altering the ecosystem that supports their complex life cycle.

Atlantic salmon begin life as eggs laid on the gravelly bottom of fast-flowing rivers and streams in New England and the Maritimes in Canada. During the next two years, the salmon progress through several life stages - called the alevin, fry and parr stages - before reaching about 6 to 8 inches in length.

It's at this smolt stage that salmon transform biologically from a freshwater fish to an ocean dweller. They will spend the next few years fattening up in the North Atlantic before swimming thousands of miles back to their river of birth to spawn.

Returning salmon are known to propel themselves over waterfalls and cascades, hence the species' Latin name *Salmo salar*, or "the leaper." Some will make the return trip several times in their lives, growing to more than 30 pounds in Maine rivers and twice that size in Canada.

But fewer and fewer adult salmon began returning to Maine waters in the 1800s after thousands of dams began blocking their upstream migration. Siltation from log drives and other pollutants helped ruin habitat needed by young salmon, while fishermen mopped up many of the adults that managed to return.

In recent decades, industrial pollution, commercial fishing in the oceans and the rise of the aquaculture industry have only contributed to the salmon's precipitous decline.

### **Restoration efforts not new**

While salmon protection and restoration efforts are more concerted now, they have been going on for more than a century.

Salmon stocking began in the Penobscot River in 1871 when Charles Atkins

established a fish hatchery near Orland. The U.S. government took over the hatchery in 1889 and has been churning out baby salmon ever since.

Today, the Craig Brook National Fish Hatchery uses the latest fisheries science and genetic techniques to produce about 3 million fry annually for six different Maine rivers.

Wild salmon are caught and brought to Craig Brook for brood stock. Computers do the match-making to maximize genetic diversity, and the spawn are kept in giant trays and tubs in biosecure rooms until they are about an inch long.

At this stage the salmon fry are trucked back to the river of their parents and released. School children help out by raising and releasing thousands more in classroom aquariums through a program aimed at building life-long salmon lovers.

"This facility has gone through many, many changes and many iterations over the years ... to where it is now an ultra-modern, state-of-the-art facility," said Carl Burger, manager of the U.S. Fish and Wildlife Service's Maine Fisheries Program Complex, which includes the Craig Brook hatchery.

Twenty miles away at the Green Lake hatchery, roughly 650,000 smolts reared from Craig Brook eggs are raised in more than 100 concrete pools. Green Lake staff produce smolts nearly twice as fast as nature by manipulating water temperature and boosting protein intake of the fish.

About 600,000 smolts are trucked over weeks to various points along the Penobscot and Piscataquis rivers, with the remaining 50,000 hauled to Massachusetts.

Raising healthy, semi-wild salmon is not cheap. The U.S. Fish and Wildlife Service spent roughly \$3 million on the two hatcheries and other restoration efforts in Maine last year.

That figure does not include the cost of staff from other federal agencies, including the U.S. Geological Survey, the Department of Agriculture, and the Bureau of Indian Affairs, which also are involved with salmon in the state.

Maine has its own agency - the Maine Atlantic Salmon Commission - focused solely on salmon restoration at a cost of roughly \$2 million, about \$700,000 of

which comes from state coffers.

Employees from the Maine Department of Inland Fisheries and Wildlife, the Department of Environmental Protection and other agencies are also involved in salmon restoration efforts.

Total annual expenditures on Maine's salmon program are difficult to ascertain because of the number of government agencies and private groups involved. But conservative estimates put the figure at more than \$5 million.

Although they prefer to discuss the fish, officials heading up Maine's restoration efforts don't shy away from money talk.

Burger, the manager of the Craig Brook complex, said hatchery officials are open to criticism for how much is spent, but he points out that his program budgets have been flat for several years.

"We're not losing ground," he said. "We are maintaining these [salmon] runs. But these runs are flat like our budget."

Patrick Keliher, executive director of the Maine ASC, said the important thing is the efforts appear to have reversed the alarming declines witnessed during the late 1990s and early 2000s. But he acknowledged that political pressure is mounting.

Earlier this week, the commission announced plans to review the hatchery programs. Keliher said the review will examine output as well as the benefits of producing smolts versus the younger fry.

"A lot of money is being spent. We are very aware of that," Keliher said. "We feel the pressure on a daily basis to make sure we are seeing positive results."

The numbers appear to be moving in the right direction — so much so that Keliher and other Maine officials feel comfortable with allowing anglers to dust off their salmon flies during a 30-day fall fishery that begins today.

ASC staff check a fish trap on the Penobscot's Veazie dam twice daily from spring through fall. Adult salmon are either kept as broodstock for Craig Brook or released upstream.

More than 1,000 adults have been counted at the Veazie trap so far this year, up slightly from last year and roughly double the returns in 2000. Roughly 70 adults have shown up in Maine's other rivers, which is three times as many as in 2005.

Biologists caution that manageable water levels and construction of an additional trap on the Kennebec River inflated this year's count. But even omitting the Kennebec returns, this year's adult counts outside of the Penobscot are still the highest since 2001 and the second highest since 1996.

Nearly everyone involved in Maine's restoration program predicts that an ambitious, collaborative effort to demolish two Penobscot dams and bypass a third offers the best chance at boosting salmon populations.

Maine politicians, environmental and conservation groups are scrambling to raise the \$50 million needed to purchase the three dams. If successful, the river restoration plan could lead to 10,000 or more fish returning to the Penobscot alone each year, Keliher said.

## **Positive sign?**

Sometimes a glimmer of hope appears where none was expected. That's exactly what happened this summer in Cove Brook, a tiny Penobscot tributary, during a routine survey of the stream's aquatic inhabitants.

Peter Ruksznis, an ASC biologist, carried on his back a large plastic contraption that looked like something out of the movie "Ghostbusters" as he and assistant Jason Czapiga strolled the brook with nets. Rubber boots protected the men from the electric shockwaves the backpack contraption sent rippling through the water.

The electric currents temporarily stunned any aquatic animals in the immediate vicinity, allowing the biologists to easily net the fish, frogs and eels as they rose to the surface. The biologists noted the species and released the critters, which quickly regained their senses and swam away.

Ruksznis "electro-fishes" this unassuming brook year after year to document its aquatic diversity. Cove Brook is one of eight waterways in Maine that the federal government says harbors populations of genetically distinct salmon

protected under the Endangered Species Act.

The biologists usually find plenty of fish in Cove Brook, but not the endangered kind.

"There were salmon here 6 years ago, but just a few," he said. "I haven't seen any since. Historically, there were a lot of salmon here."

Moments later, however, a baby salmon popped to the surface amid the plethora of brook trout, suckers and eels. The men measured the 2 ½-inch fish and took a small clipping from its fin to determine its genetic lineage.

Due to tight budgets and space constraints at the hatcheries, Cove Brook and the Ducktrap River do not receive any hatchery-raised fish despite the federal protection. Biologists said they reluctantly "left out" the two small streams to focus on the rivers with the most potential for big returns.

So are Cove Brook's wild salmon populations rebounding on their own?

Ruksznis was pleased, but by no means elated, by the find. He speculated that the tiny fish's parents could have strayed into the brook from the Penobscot. The worst case scenario is that an adult aquaculture escapee found the brook and a mate and was now "diluting" the wild gene pool with weaker, biologically inferior offspring.

But ideally, two adults that were born in Cove Brook managed to survive to sexual maturity and somehow returned home to spawn.

Unfortunately, that would be the only salmon the two men found in Cove Brook that day. They put the months-old fish back into the stream, knowing the odds were slim of finding it or its offspring in Cove Brook again a few years from now.

While finding a young salmon was definitely a "good sign," Cove Brook will need to produce many more salmon to recover, Ruksznis said.

"That one little fish doesn't amount to much," he said.

Still, Ruksznis and others involved in the restoration are not ready to give up on a species that holds such an honored place in Maine history and culture.

"I know I remain optimistic. I know the [ASC] board of commissioners is optimistic," Keliher said. "And we continue to see staff working their tails off."

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