Bringing Chum Salmon Back To Cooper Creek: Consequences for Fish and People

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Introduction

Cooper Creek is a small perennial salmon stream located at the head of Eagle Harbor on Bainbridge Island, WA. This stream was the subject of major restoration in 2001 to replace a fish-impassable culvert and an in-stream impoundment that provided drinking water to the Island in the early 20th century.

Historically, Cooper Creek likely supported hundreds of returning adult salmon each fall. Over time these numbers have declined, both because of changes to Cooper Creek itself as well as due to larger-scale threats to salmon throughout the region. The Bainbridge Island Watershed Council (BIWC) monitored this stream for four years prior to the start of this program, and recorded only one adult chum salmon (Figure 1) and a handful of cutthroat trout during this time period.

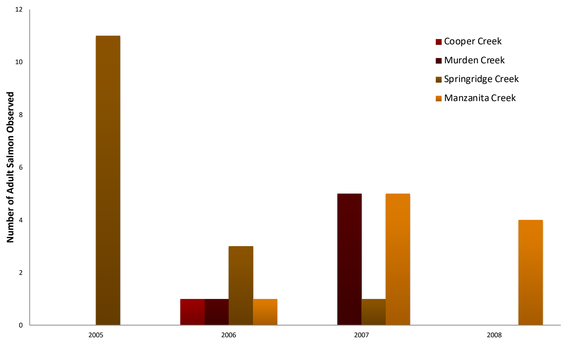

Figure 1. Number of spawning salmon observed in four Bainbridge Island Streams prior to Cooper Creek program initiation. Only one adult salmon was observed returning to Cooper Creek (in bright red on figure above) over this four-year monitoring period.

Based on the fact that this stream was impassible for several decades and the observed low rates of return, multiple partners in salmon conservation decided to undertake a multi-year supplementation program. The BIWC, in partnership with the City of Bainbridge Island and the Suquamish Tribe, undertook a four-year program to bring back salmon to Cooper Creek.

The objective of the Cooper Creek Program was to supplement the native salmon population over multiple years with fish from a nearby source whose genetics are similar to those of our Bainbridge Island fish. This supplementation can help to jump-start a healthy return of fish for this stream and re-introduce the important supply of nutrients and food that salmon bring back from the marine environment to freshwater and terrestrial food webs of the Island. We also designed the program with the objective of giving many volunteers a hands-on opportunity to see and work with fish in their local streams.

Methods and Materials

We installed a streamside fiberglass raceway supplied with a gravity-fed hydraulic piping system (see photos below). The tank and piping was installed and removed each season from 2009 - 2012, so the infrastructure was only present on the stream during the March – May project period for the duration of the program.

Approximately 12,000 to 15,000 salmon fry were raised in the raceway each Spring. Fry were obtained from the Suquamish Tribe's Cowling Creek hatchery in Indianola, WA, and had been raised from eggs harvested from salmon from Chico Creek in Silverdale, WA, a few miles to the southeast of Bainbridge Island.

Fry were placed in the raceway in groups of 3,000 to 5,000 at a time and remained for a minimum of 2 weeks prior to being released in to the stream. Volunteers hand-fed the salmon 3 times per day, 7 days per week, and vacuumed the tank daily.

Volunteers installing the raceway in which the salmon are raised.

Volunteers installing the gravity-fed piping that brought fresh water through the raceway from upstream.

Results for Salmon

Our first returns to Cooper Creek from the supplementation program occurred in the Fall of 2012, when we welcomed back at least a dozen returning fish. In Fall of 2013, we recorded only 1 returning adult fish (Figure 4).

Our predicted rate of return based on supplementary feeding and growth was 1%, an order of magnitude greater than the typical rule-of-thumb for returns of 0.1%; therefore, our goal was on the order of 100 fish back from a year class during the 4 to 5 year returners. Our returns were well below this number, though for 2012, numbers were consistent with the rate of return across our other Island streams (Figure 2).

In 2013, our poor return was lower than west-side stream returns (Springridge and Manzanita Creeks) but similar to return rates for the nearest neighbor stream, Murden Creek, which is also located on the east side of Bainbridge Island. We posit that local fishing pressures may have played a role in rates of return for these two east-side streams given the localization of these low numbers.

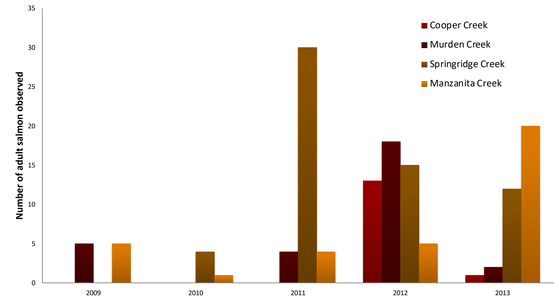

Figure 2. Number of spawning salmon observed in four Bainbridge Island Streams from 2009, the year of Cooper Creek Program initiation, to 2013. 2012 marked the first year of adult returns to Cooper Creek from the Program.

Results for People

The Cooper Creek Program involved 92 volunteers and over 1100 volunteer hours. Participants ranged from high school students to retirees. We also partnered with a Department of State program that brought a dozen foreign exchange students from central and southeast Asia to participate in the last two years of our Program. Many of these students had never participated in an environmental activity or volunteer work before.

The 2012 Foreign Exchange Student Cohort…

…puts their boots on the ground…

…to help our fish!

Our exchange students captured the lessons of this Program beautifully in their writings about their experience: as Nabila, an exchange student from Indonesia, said, "*It's really important to preserve our nature and in order to do that, we've to start from ourselves. It begins from one person and it develops into mass number of people,*" and as Ravi from Malaysia added, *"I'm going to make sure when I get home, I myself don't do anything that might hurt the environment. I will start small by first making sure not to throw rubbish into the River."* These straightforward statements beautifully articulate our objectives to grow our volunteers' sense of empowerment and stewardship in conservation actions.

Conclusions

It is too early to tell what the long-term sustainability of this Program will be for Cooper Creek salmon. However, this program was an unquestionable success in involving many people in salmon conservation, particularly many students and individuals who had never before seen live salmon in their natural habitat or even participated in environmental work before. Growing this awareness and caring is some of the most fundamentally important work we can do protect the future of both salmon and people.

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