

“Salmon on the Rough Edge of Canada and Beyond”



Salmon
People

This series of 10-short stories has been written to honour the salmon, the beautiful rivers that they exist in and some of these memorable people who have worked tirelessly over the past decades on the task of conserving and restoring these iconic species.



The author, Matt Foy, as a biologist with the Fisheries and Oceans Canada (DFO), Salmonid Enhancement Program(SEP) for 35 years (now retired), has tried to capture small glimpses into their world and the world of salmon.

A Squamish Thanksgiving

By Matt Foy

Located in south-western British Columbia, Canada, the Squamish River is a large glacial fed watershed. The brawling mountain river, with its major tributaries such as the Elaho, Cheakamus, Ashlu, and Mamquam Rivers drains from the rugged terrain of the BC Coast mountains into the head of Howe Sound, part of the Salish Sea. Once known for its prolific runs of pink salmon these runs were decimated during the late- twentieth century. This is a story about their remarkable recovery and some of the people who worked hard to see pink salmon return to this beautiful mountain domain.

As summer slid into fall, the phenomenal pink salmon run to the Squamish River was just winding down. The run of 2013 had exceeded all expectations, and such an abundance of pink salmon had not been observed in over fifty years, since the memorable return of 1963. For many people, the 2013 return would seem to have come out of nowhere but many other people understood the hard work and dedication that had led to this remarkable recovery.

In that season of giving thanks, it seems fitting to reflect back on the path that has led from the last great run of 1963 to the years when pink salmon were almost absent from the Squamish River watershed, to the fall of 2013, one of great abundance to be celebrated and remembered.



Upper Howe Sound, Squamish, BC, Canada

Photo: Courtesy Ruth Hartnup

Boom and Bust

The growth decades of the 1950's through the 1970's were not kind to pink salmon populations around the Strait of Georgia. A booming logging industry, rapid industrial and urban development, hydro-dam construction along with an exuberant commercial fishery in Johnstone and Georgia Straits all conspired to reduce, and then collapse pink salmon all around the Georgia Basin.

On the East Coast of Vancouver Island, rivers which previously had abundant pink salmon returns, such as the Oyster River, had only handfuls of pink salmon spawning in them by the late 1970's. This same story was repeated on other large rivers such as the Puntledge and Nanaimo Rivers, down to the many small pink salmon spawning streams such as Nile Creek.

A similar fate befell the pink salmon of the Squamish River watershed, with the much talked about pink salmon run of 1963, after providing fish for all the ocean fisheries, including a commercial net fishery within Howe Sound itself, and the various in- river fisheries for food and recreation, still managed a spawning ground escapement above 750,000 spawners that year.

A series of weaker returns in subsequent years, much reduced, but still fished commercially, cumulated in the particularly weak return of 1975, when less than 50,000 pink salmon spawned in the streams of the watershed.



Squamish River, BC, Canada

Photo: Courtesy Kirk +Barb Nelson

That was the last year for many years when one could still easily find a Squamish River pink salmon.

The memorable rain storm and then flood of 1975 tore at the hills and valleys and reshaped the river banks recently cleared of their timber. River channels shifted, gravels were scoured and tossed downstream, and the pink salmon spawn of 1975 did not have a chance. By 1977, it was a rare sight to see a pink salmon spawning in any stream within the Squamish River watershed, and this would be case for over a generation.

Early in the Salmonid Enhancement Program (SEP), biologists understood the magnitude of the losses to the non-Fraser pink salmon populations around the Georgia Basin. Soon after the construction of the Quinsam River Fish Hatchery, near Campbell River, Vancouver Island BC, commissioned in 1975, an effort was made to rebuild the pink salmon in that watershed.

As the return of pink salmon strengthened to the Quinsam and Campbell Rivers, community partners on other Vancouver Island, Strait of Georgia streams with previously abundant pink salmon runs, requested and received fertilized pink salmon eggs from the Quinsam River facility. They hoped to restore, then rebuild pink salmon in

their home streams, the Oyster, Big Qualicum, and Nanaimo Rivers and one little stream, known as Nile Creek. All had lost their once abundant pink salmon runs but were willing to commit to a long- term effort to see them returned.

Each of these rivers have their own story of the loss and recovery of their pink salmon legacy. But one stream, Nile Creek, captures the joy and excitement of seeing what was once lost to be found again.

This small stream which was known locally as “Pink River” had indeed lost its namesake pink salmon in the exuberant years of the twentieth century. But due to the hard work and effort of both the Quinsam Hatchery staff and a local volunteer group, the Nile Creek Enhancement Society, in the new century, pink salmon once again returned in abundance to this little river.



Nile Creek, Qualicum Beach, BC Canada

<http://nilecreek.org/our-history>

Faith

Encouraged by the success at recovering pink salmon populations in Vancouver Island streams, a pink salmon recovery program was initiated in the Squamish River in 1985. That year, SEP biologists and engineers from the Resource Restoration Unit (formerly Small Projects Unit) developed a plan to return pink salmon to the watershed and restore critical Squamish River and tributary spawning grounds, through development of protected side channels for use by the much-reduced Squamish River pink salmon population that would provide refuges from large channel shifting floods.

The SEP Tenderfoot Creek Salmon Hatchery,

<http://www.pac.dfo-mpo.gc.ca/sep-pmvs/projects-projets/tenderfoot/tenderfoot-eng.html>

constructed only a few years before on the Cheakamus River, which had previously been the most prolific producer of pink salmon in the Squamish River watershed but was almost totally barren of this species after 1977, began to collaborate with other SEP groups to deliver a plan to restore the once great pink salmon runs. The adjacent Indian River watershed, which still managed to maintain a healthy pink salmon population, was

identified as a good source of eggs to replenish the now diminished Squamish River populations.

Beginning in the fall of 1985 through the fall of 1993 many millions of pink salmon eggs were collected in the Indian River, incubated at the Tenderfoot facility and then planted into protected restored side channels within the Squamish River watershed. Adult collection and egg takes were delivered by a motivated crew of Resource Restoration staff led by Bob Brown, Senior biological technician and younger staff such as Doug Lofthouse, Mel Sheng, and Sam Gidora. Bob directed, did and delivered and us younger members watched and did what we were told but it all got done somehow.

We would beg, borrow or steal whatever persons that were willing to get wet and tired on this task from the Tenderfoot and Seymour Hatchery staff. Dave Celli, Murray MacDonald and Brian Klassen from Tenderfoot and Janice Jarvis and later Brian Smith from Seymour Salmonid Society provided the extra horsepower to get the job done before the light was lost and the planes could not fly. <http://www.seymoursalmon.com/>

This program was a labour of love and all those involved set aside other duties to make time to get the eggs collected in a difficult and remote location. Planes, trains and automobiles (well maybe not trains) and more than a few jet boats were needed to capture and transport eggs from the Indian River in Burrard Inlet far around and over to the Cheakamus River near Squamish.

A typical Indian River pink egg-take day started first thing in the morning as the sun came up at the Deep Cove Marina in North Vancouver. The half- awake crew would assemble there and when all had arrived we started off in the old warhorse Hourston 18- foot runabout speedboat. Often times in those late September and early October mornings this meant fog at the junction of the Burrard Inlet and the Indian Arm. Once in a while it meant drifting around in circles for an hour until the sun came higher in the sky and the fog lifted and it was safe again to resume speed up the inlet.

After an hour of the most beautiful boat ride in the world we would be pulling into the old Weldwood logging camp dock up at the head of Indian Arm. We had brought in a truck over the rough road from Squamish and left it parked in the valley at a cabin where we knew the occupants, to use during egg-take days. From the dock it was a short walk to the cabin and then quick 5-minute drive with all the egg take gear to the old 1960's era Indian River fish fence site and the big rock pool where the pink salmon liked to hold first as they moved above the tides into the river.

After unloading all the egg-take gear and retrieving the small jet boat we had also left in the valley at a cabin we were ready for the day's work. The small boat was used to haul out a 150- foot seine net through the deep pool which the crew then pulled onto the sandy beach. Captured fish were sorted and those pink salmon not ready to spawn or other salmon species caught were released back into the river. Ripe pink salmon were killed and prepared for spawning. After all the eggs had been collected in five- gallon pails and sperm stored in small plastic bags and placed in a cooler this phase of the work was completed. We tried to wrap up the egg-takes by early afternoon so we did not lose the light in case it ended up being a long day.

Some days, if we were lucky, the Tenderfoot Hatchery crew would have driven over the bone rattling logging road over the Stawamus River pass into the Indian River while we worked. They would then take the days eggs back to Tenderfoot Hatchery and place them into the incubators. That was a good day.

On other days if the weather looked good and the Tenderfoot crew were busy with their other duties, a small Cessna plane would land out on the Arm and we could load the eggs onto it for transport back to the head of Howe Sound to be picked up by the Tenderfoot crew. That was a pretty good day.

On really bad weather days or when everyone was short staffed the eggs were taken for a boat ride back with the crew to Deep Cove, loaded on to the truck and then transported by an unlucky few all the way around the Sea-to Sky highway and up to Squamish and the Tenderfoot Hatchery. Those were really long, long days with a few souls leaving home at 5:00 AM and arriving home after 8:00 PM. As I recall overtime was sort of discouraged since this was an “off the side of our desk” program and sort of based on stepping up and volunteering to do what it took. That was a bad day but it all worked out in the end and made for a good story over a beer once the program wrapped up for the year.

This was the Indian River pink egg take program for the next five years beginning in the fall of 1985 and finishing up in 1993. Over those years anywhere from 1 to 4 million eggs were taken annually at the Indian River and then placed into the Tenderfoot Salmon Hatchery in Squamish.



Squamish River female pink salmon

Over in the Squamish River watershed, during these years, there was another effort to collect as many pink salmon from that watershed as was possible. We soon found out

this was a difficult task. During the fall of 1985 teams were sent around the Squamish River spawning grounds to look for any remaining pink salmon. The plan was to collect as many native Squamish River pink salmon as possible.

Everywhere the teams went no pink salmon could be found. The local Squamish Fishery Officer Bert Ionsen, who was an early supporter of the pink salmon restoration effort, took it upon himself to look for pink salmon while doing an aerial survey of spawning Chinook salmon in the watershed. He gave us the first solid lead where the elusive Squamish River pink salmon might still be found.

On one of his flights up the Mamquam River, a lower Squamish River tributary previously known as a strong producer of pink salmon, Bert observed perhaps 100 pink salmon spawning out on the riffles in the lower Mamquam River. The chase was on to capture some of the local genetic legacy. After many tries and much effort a grand total of five, yes five, male pink salmon were captured in the Mamquam River that year.

These “Mamquam Five” were treated like gold and expected to step up do their duty to pass on their genes to the next generation of Squamish watershed pink salmon.

It is always preferred to use the salmon from the particular river when working on a restoration program for that river. The next best option is to mate males from the local population with females from the nearest river which still had a healthy population. So, we tried to do our best during the Squamish pink salmon program.

However, using five males might not be the best technique but we thought of a scheme to give them at least a chance to father the next generation before we would use sperm from the Indian River males.

When the eggs from the Indian River arrived at the Tenderfoot hatchery in the five-gallon pails, they were then divided into five smaller lots. Squamish male #1 was pulled out and his sperm was expressed into the first lot. Male #2 into the next lot, #3 into the next and so on. Then the sperm from the Indian River males was removed from the cooler and the bags placed by each of the smaller egg lots.

Water was then added to each container and the Mamquam sperm and eggs were gently mixed by hand to help with distributing the somewhat meagre offering of sperm among the eggs. This happy union was then left for thirty seconds to give the little sperm a fair chance to swim into each egg. But with the males being used for each egg take and the males getting rather tired looking the risk is that some or all of the eggs might remain unfertilized.

So, at the end of the gentlemanly period of grace for the Mamquam sperm, a full bag of Indian River sperm was added to the mix and a little dance was done by the crew to urge them to get on with it and find any unfertilized eggs that may have been missed by the first guys. The little holes the sperm use to go into the eggs slowly start closing once

water is added to the mix so we all wanted them to hurry up and not waste all the hard work it had taken to get the eggs in the first place.

The last piece of the restoration puzzle was what to do with the pink salmon eggs after they reached the eyed stage. The challenge was that the Tenderfoot Hatchery was a fully groundwater fed facility. Groundwater stays much warmer than surface water during the winter which worked out okay for the Chinook, coho and chum salmon the hatchery was designed to produce. It had not been designed for pink salmon as they were assumed to be lost as a population at that time.

If you placed a pink salmon egg into the hatchery in late September it would be ready to migrate as a fry by around mid-January, around two or three months before natural fry in the river were ready to migrate. This was a problem. The solution was to plant the eyed eggs into protected side channel areas, specially designed for the program. The water in these areas was much cooler than the hatchery and the fry would be ready to migrate closer to the proper time in late March to late April.

For the first 1985 season all the eyed eggs were placed in the gravel at the upper end of the Mamquam Channel and covered with sheets of plastic. Never having been done before everyone waited expectantly for spring to see how this all turned out. Just like clockwork the little pink fry emerged on time and headed down the channel into the Mamquam River after achieving eyed egg to fry survivals of 85-90% over the winter. A success by any measure. What would come back in 1987 however, was the real question and for that we all had to wait a little while longer.

Hope

When Bert Ionson made his first flight up the Mamquam River in the fall of 1987 to have a look, he was a very popular man. Was there 1000 or 2000 or maybe 5000 pinks Bert? What had he seen? Come on spill the beans!

That year Bert's estimate for the number of spawning pink salmon in the Mamquam river was 25,000, the best since the early 1970's. We were off to the races and the rest is history. In later years pink salmon fry were also released in the Cheakamus and Stawamus Rivers to spread the pink wave around the Squamish watershed however there were early signs they were doing this themselves.

By the late 1990's, the pink salmon returns had noticeably strengthened in the Squamish River, and pink salmon could be easily seen on the Cheakamus, Ashlu, Shovelnose, Stawamus and Mamquam River spawning grounds. With the noticeable return of pink salmon to the watershed there was a renewed effort to provide more extensive areas of protected side channels and improvements to Squamish estuary rearing grounds for the now rebuilding pink salmon populations.



Schooling salmon in Mamquam River, Squamish BC, Canada

Community partners, such as the Squamish River Watershed Society (<https://www.squamishwatershed.com/>), formed during the late 1990's, and worked in partnership with SEP restoration experts to acquire funds from programs such as the federal Habitat Restoration and Salmonid Enhancement Program, or BC Government funds such as FRBC Watershed Restoration Program, or Corporate funds such as BC Hydro Fish and Wildlife Compensation Program, or the CN Rail, Cheakamus Ecosystem Restoration Program.

Later, groups such as the Squamish Streamkeepers (<http://squamishstreamkeepers.net/streamkeepers/Welcome.html>)

and Squamish River Roundtable formed to provide other voices for environmental effort and recovery programs in the Squamish River and Howe Sound. All these groups have collaborated and reached across their interests to partner with others to deliver a cooperative effort to restore the great pink salmon run of the Squamish River.

Major community partners came forward to work with SEP and offer access to lands to further the restoration of critical pink salmon spawning and rearing habitats. Working with committed salmon advocates, Gibby Jacobs and Randall Lewis, Squamish Nation lands on the Cheakamus River, and later on the Ashlu River and Mamquam Island, were opened for development of protected side channels for salmon spawning and rearing. The North Vancouver Outdoor School (Cheakamus Centre) school Principle, Vic Elderton and Property Manager Carl Halvorson, arranged to provide access to this

extensive property along the Cheakamus River, which now contains the largest amount of restored side channel habitats in the Squamish River watershed.

<http://www.cheakamuscentre.ca/about-us/conservation>

The District of Squamish offered up lands they controlled along the Mamquam River and Mamquam Blind Channel for restoration of fish habitats. BC Rail and later CN Rail gave access to their land holdings in the Squamish Estuary, to allow for tidal channel re-connection, including the Mamquam Blind Channel re-connection and installation of fish passage dyke culverts and marsh restoration that provided much improved critical early habitats as pink salmon move from nursery streams to the ocean each spring.

After a period of slow but steady recovery, pink salmon populations returned for the first time in some abundance in the 2003 brood year, at levels not observed since the 1960's. Unfortunately, the flood of record for the Squamish River watershed occurred on October 18, 2003, just after the majority of pink salmon had completed spawning. Information gathered by BC Hydro assessments on the Cheakamus River, indicated extremely high mortality for eggs deposited in the Cheakamus River. These studies also confirmed the value of the protected side channel habitats, where a single such restored side channel was found to have produced over 95% of the total number of fry that survived in the upper 10- kilometers of the Cheakamus River after the 2003 flood event.

The large pink salmon escapement of 2003, and the extensive network of restored side channels on the Cheakamus River, Shovelnose Creek, the upper Squamish River, Ashlu Creek and the Mamquam River are believed to be the key factors that prevented the repeat of the catastrophic collapse experienced from the large flood of 1975.

Up on the Ashlu River, the Little Ashlu side channel, restored to health in the summer of 1997 was one place of refuge. The first phase of this extensive restoration project was started that year by Harold Beardmore, Al Jonsson and Jonathon Bulcock of DFO-SEP working in partnership with the BC Watershed Restoration Program and with Karl Wilson from the Steelhead Society.

From fewer than 100 pink salmon counted in the Little Ashlu the fall of 1997, in each subsequent cycle the numbers of spawners increased and by 2003, Steve Rochetta, a BC government grizzly bear biologist



Little Ashlu Side channel

and keen observer of all things salmon reported **a pink wave from one end of the Little Ashlu to the other.**

Steve and a crew of stream stewards had worked with the SEP over the years to restore and nurture the historically important pink salmon spawning ground within this protected side channel. Randall Lewis and Edith Tobe, Squamish River Watershed Society and Dr. Jonn Madsen, Jack Cooley, Scott Renyard and Don Lawrence from the Squamish Stream keepers, walk, count, think and care about this special salmon place like their own family.

Downstream on the Cheakamus River, BC Hydro assessments of pink fry migrations during the spring of 2006 and in subsequent years indicated a steady recovery of pink salmon in that watershed since the big 2003 flood year. From lows of 1.4 million migrating fry in the spring of 2004, to over the 29 million fry in the spring of 2012, when pink salmon fry abundance in the Cheakamus River and by inference the Squamish River had approached levels of abundance not observed since the 1960's.

The stage was set in the spring of 2012, for a strong return of pink salmon to the Squamish River watershed, in the fall of 2013, but no one would have predicted how bountiful the ocean would be over the subsequent months these fish were at sea. From Alaska, to central and northern BC, through southern BC and into Puget Sound, pink salmon returns in 2013, approached record levels in many watersheds.

Summer of Abundance

During the late summer of 2013, for the first time in almost 50-years, triggered by a large abundance of pink salmon moving up toward the Squamish River a commercial pink salmon fishery was re-opened in Howe Sound. That year, a three- day pilot seine fishery, operated from Aug 22-24, and captured approximately 100,000 pink salmon per day, (total catch 280,000) with only two boats fishing at one time.

That same year the watershed stewards estimated that the return of pink salmon to the Squamish River watershed exceeded 1.0 million spawners, with pink salmon observed throughout the Cheakamus, Ashlu, Stawamus, Mamquam, Elaho and Squamish Rivers as far up as a salmon can swim, leaping at barrier waterfalls in their abundance.

Luanne Patterson and Peter Frederikson, working on a CN Rail sponsored salmon recovery program, installed a new fish friendly culvert crossing under the CN Rail line where Tenderfoot Creek enters the Cheakamus River. For the first time in living memory pink salmon entered Tenderfoot Creek, with over ten thousand pink salmon on the spawning grounds. An unexpected Thanksgiving gift to the hatchery staff for their efforts so many years before.

But the lesson learned must be that by working together to restore salmon to healthy levels of abundance, once in a while, perhaps once in a lifetime, nature will conspire to surprise and inspire and humble those who believe that paradise lost can never be

Thanks for all the grandparents, parents, brothers or sisters, sons and daughters, that fished for or watched the great pink salmon run of 2013, perhaps with friends, relatives, or grandchildren, reliving their youth, back in 1963, and reconnecting and sharing with the younger generation, who together, witnessed the great run of 2013.

Thanks that the dominant male grizzly bear, who comes down from the hills each fall to rule over the Ashlu River Flats, who ate many pink salmon and grew very fat that year. After such an abundance his sleep will be peaceful, under the snows, in the shadow of the Tantalus Range, such that he can emerge from his winter den high on the slopes of Mt. Jimmy Jimmy, healthy and alive into the next year's spring sunshine.

Thanks that the harbor seals, congregating along the shores of Howe Sound, with their new pups that have grown fat on the pink salmon of 2013, will better survive the lean winter months ahead and remain strong so they can face the challenges they know will find them.

Thanks, that the grandmother transient killer whales, using old memories of the sweet taste of blood and fat from rich mammal blubber from days long past, have followed the pink salmon into the Sound, leading their pod, to a place of abundance, knowing the others, who give them life, will be there waiting for them.

As the official holiday of Thanksgiving approached in the memorable fall of 2013, many people in the Squamish River and along other pink salmon streams throughout the Salish Sea and beyond, understood that perhaps the season of thanksgiving came a little bit early that year, and that is reason enough, to give special thanks, for a Squamish River Thanksgiving.