

Low on Fish Yet High on Fish

by Morgan Hite

You probably know the Upper Bulkley river. It's a flat and slow stream, glimpsed off in the willows as you drive highway 16 from Houston up towards Topley. It meanders back and forth, brown and sluggish, hardly a river at all, you might think. If you ride Via Rail you see other parts of it, a series of wide, arcing channels through which the rails cleave a straight path. You might even think it looks like good habitat for something.

People say that back in the 1950s and 60s there were a lot of coho salmon in this river, so many coho that the farmers used to use pitchforks to pull them out and feed the pigs. That's a piece of oral history related to me by Cindy Verbeek, who runs the Upper Bulkley Streamkeepers program out of the Buck Creek Hatchery in Houston. The Upper Bulkley was once a vibrant spawning habitat for salmon, gravelly-bottomed and chilly: just what salmon like.

But over the last fifty years it's become less fruitful. Today, this river is closed to fishing, and this last year when Cindy and her volunteer teams went out to look for spawning female coho they found far fewer than the hundreds that must have been there historically. They found... seven.

The Upper Bulkley Streamkeepers program in Houston, founded by Cindy in 2016, is all about bringing coho back to the Upper Bulkley. It's part of a suite of environmental education and conservation programs run throughout Canada by the non-profit organization A Rocha Canada (arocha.ca).

This is not an armchair project. In the fall, volunteers comb the watershed for spawning females. If they find them, they wade in with seine nets to capture just enough to stock the hatchery for that winter. Fishermen who remember fishing the Upper Bulkley in years past come out to help too, as their skills can be useful for capturing a spawning female.

"People in Houston are such doers," Cindy says. "They like to be active and they get a lot done." Salmon, she notes, unite the community and bring her volunteers of all stripes.

The life story of a salmon is not easy. Out of 2500 eggs laid in stream gravels, perhaps 375 will mature into fry, small fish less than 10 cm long. They will live in the river for one or two years, until they reach a weight of 12–15 grams. When it's time to head for the sea, they are termed *smolts*, and at this point there are probably only 30 left from that original set of eggs.

In a hatchery things are a little different. Almost all of those 2500 eggs will survive to become fry, and when the fry are released in their first spring, when the river comes down after spring flood, there are still almost 1700 of them alive. (And they're a bit bigger than their cousins who hatched in the river.) The original number of eggs now translates into 250 smolts heading for a sea a year or two later. You could argue that for a female coho, being captured by the streamkeepers is the best possible advantage she can give her offspring.

Of course the fry and smolts, while they are in the river, will have to evade the steelhead. Steelhead, the famous sport fish which brings so many visitors to the Bulkley Valley in September and October, enjoy the special advantage of protected status: you must release any that you catch. Since nothing preys on steelhead, their only mortality is from old age, or mishandling, or being caught and released too many times.

Steelhead continue to live under the ice all winter and spawn in the spring, so they are always there, the salmon's main predator. Even when they are peers, the two year-old steelhead is bigger than the two-year-old coho.

If the smolt is lucky, he or she makes it to the sea, spends two or three years there as an adult, and then, four years after being born, runs a gauntlet of fishing boats trying to catch them before they reenter the river. They also run the gauntlet of sport fishermen on the river as head back up to Houston to spawn. And finally, at the Upper Bulkley, hopefully the water is cool enough, plentiful enough, and has enough oxygen in it, to make spawning possible. A lot of ifs.

Some of the things that have made it difficult for coho to spawn in the Upper Bulkley in the past fifty years include a dramatic increase in forestry and farming, both of which have meant that with less tree cover the water going into the upper Bulkley is *warmer*. They have also increased the erosion, resulting in murkier water with a less gravelly bottom.

The Upper Bulkley also has seen a lot of what habitat specialist call *linear development*: roads and railways, specifically Highway 16 and the CN rail line. These long lines of thin but continuous infrastructure are especially pernicious when they divide the habitat. A side-stream that is bridged flows freely into the Upper Bulkley, but one that has to pass through a culvert under the roadbed or railbed can be cut off. When the streambed erodes lower, the discharge end end of the culvert can be left up in the air, out of the water: at low water levels there's no way for a salmon to pass through there. And side-streams should feed the main river with gravel, but culverts often stop this gravel transport.

Cindy shows me photographs of what they call "fish salvage" operations. These occur in the fall when water levels are falling and fish become trapped in side pools on the wrong side of the highway or the railway. The pools will eventually dry up, so the fish are captured and transported back to the main stem of the river.

Even beavers have gotten involved, as some channels of the Upper Bulkley are slow enough to allow cross-river dams, migration barriers for salmon. Streamkeepers have counted up to 125 beaver dams along 60 kilometres of the Upper Bulkley.

Sometimes a fine comedy plays out in the fall when, by day, Streamkeepers volunteers partially open a beaver dam to create a channel that spawning females can pass, and by night the beavers repair the damage. The volunteers will be back every day they can until the spawning females are gone. And the beavers will be back every night. Their dams are important for the watershed as a whole because they retain valuable water.

In addition the salmon rely on October rains to raise water levels enough that they can enter the mouths of small side-streams. If those rains don't come, salmon can fail to find a good spawning channel. In 2018 those rains did not arrive until November.

The watershed that the Streamkeepers look after is enormous even for the forty-three volunteers Cindy coordinated last year. It stretches up the Upper Bulkley 60 kilometres east of Houston to Bulkley and Maxan lakes, as well as 30 kilometres south of Houston up Buck Creek to Goosley Lake. Side streams coming in all along are important as well, including Aitkin, McQuarrie, Byman and Richfield Creeks.

Buck Creek, some 30 kilometres long, is the most significant tributary of the Upper Bulkley. At its headwaters sits the Equity Silver mine site, active in the early 1990s. Acid runoff from the mine at that time impacted this tributary of the Upper Bulkley more than anything else. Today runoff from the site is not harmful, but the creek itself still battles the reputation of being "dead."

All in all, years of fisheries studies along the Upper Bulkley support the fact that it is one of the most impacted rivers in the Skeena watershed.

The Buck Creek Hatchery itself, built two years ago with donated funds, labour and materials, is a tiny but attractive building that sits just off highway 16 in Houston, a stone's throw from KalTire, on land provided by CanFor. In addition to the salmon tanks and the filtration and cooling system for the water, it houses a small environmental education centre. The 2019 salmon will be the third release. In 2020 Cindy hopes to see the first return of spawning coho from the first release in 2016.

On winter days, newly hatched eggs in the hatchery need to be fed every half hour, and there is a steady stream of volunteers stopping by to make sure this happens. (Yes, there is an automatic fish feeder in case no volunteer can be found.) In the Spring the fry still need to be fed four times a day. This year there are about 750 fry in the hatchery's tank, ready to be released once river levels drop a bit. But the optimism of the program is evident in the fact that the tank could hold up to 10,000.

Cindy is careful about each and every fry in the Streamkeepers care. She even fishes out the smallest individuals and put them in their own tank, having observed that in the main tank they have trouble competing for food.

As you might expect, school groups are quite common at the hatchery, and it's irresistible to watch the fish as they school and scatter, and home in on edible things. Fund-raising is now underway for a separate environmental education centre to be built. \$300,000 are needed, with only \$17,000 raised so far.

With help from the Office of the Wet'suwer'en and the Toboggan Creek hatchery, Streamkeepers have been able to benefit from a couple of years of studies on the habitat and conditions in the Upper Bulkley. A return of two-to-three hundred salmon would be more typical for this area, so seven found last year was an especially disappointing return. Two years of sampling by the Office of the Wetsuweten indicates that water temperature and dissolved oxygen are the two crucial factors limiting salmon in this watershed.

SIDEBAR: **Wedzenkwe, Morice and Bulkley**

Rivers are almost always named for the bigger waterway coming in at a confluence. For example, at Hazelton the smaller Bulkley meets the larger Skeena, and the waters continue as the Skeena. At Prince George the smaller Nechako meets the larger Fraser, and these continue as the Fraser.

So how come at Houston, where the much larger Morice meets the tiny Upper Bulkley, do they continue on as the Bulkley? The original Witsuwet'in naming was quite clear: one could follow the Wedzenkwe (blue-green river) up from Witsset, past what is today Houston, and on to its source in Wedzen-Bin (today called Morice Lake). That was the main stem of the river; everything else was a tributary.

The Morice–Bulkley naming confusion dates back to around the year 1900 and the assignment of colonial names in this region. Father Adrien-Gabriel Morice, an Oblate priest who lived in the area, had travelled extensively and was quite clear that the river which came down from Wedzen-Bin and the river that flowed past Witsset were the same. But he was not on hand when Victoria's surveyor A.L. Poudrier, travelling up the river from Hazelton in 1893, decided to name what he called the "Watsonkwa" after Colonel Bulkley, the man who had been in charge of a survey party some 30 years earlier scouting a route for a telegraph from New Westminster to Europe via Alaska and Siberia. But Poudrier named the river after Bulkley only as far up as Houston. At this point Poudrier continued the name "Bulkley" up the small tributary that led east towards the Decker Lake, perhaps because this was the way the telegraph had come in the 1860s, and was the way the wagon road from Vancouver still came. To add insult to injury, he named the main body of the river above Houston for Father Morice himself!

Morice proposed otherwise in 1907, when he, now living in Winnipeg, published his "Map of the Northern Interior of British Columbia." He carried the name Bulkley all the way up the main river to the large lake at its headwaters, Wedzen-Bin, which he called Loring Lake. He moved the name Morice River to the small tributary coming down from Topley.

"There cannot be a shadow of a doubt," Morice is quoted as saying with disgust in the *Interior News* of May 24th, 1919, "that Poudrier was never at the confluence of the two rivers."

When the Grand Trunk Pacific railway was built (today's CN), its route into the watershed via Decker Lake reinforced the idea that this small river was the "Upper Bulkley," a name it continues to bear.