

Trapped Still

BY JIM McLENNAN

THE TROUT TRUST



The Oldman Reservoir, pictured in 1985.
Photo © C. Wallis

At the turn of the 20th century, residents of the soon-to-be province of Alberta were excited and optimistic about the province's future and their place in it. The railroad had come, courtesy of the CPR. Alberta's agricultural immigration boom was in progress, and farming and ranching were quickly becoming major drivers of the province's economy. But southern Alberta lacked one critical component for crop-based agriculture to succeed: water. Or, at least water easily accessed by the dry-land farmers.

Enter irrigation, a water delivery system. Prompted in part by severe drought in the early 1890s, the first large-scale irrigation project began, and in the summer of 1900 water from the St. Mary River began to flow northeastward into and through 185 kilometres (115 miles) of canals and ditches toward Lethbridge.

Native cutthroats, bull trout, mountain whitefish, and a few other species swam in Alberta's rivers at the time, but it soon became apparent that as well as taking water from the rivers, these canals were taking fish. Fish entered the canals simply because there was nothing to prevent them from doing so. And just as it was for the water, the trip was a one-way journey for those fish; they died when the canals dried up in the fall.

A 1910 report to the Dominion of Canada by the Alberta and Saskatchewan Fisheries Commission found "The subject of irrigation ditches came prominently before the commission, especially in southern Alberta, and there was abundant evidence to show that considerable damage had been done and is being done to the fisheries of these streams,

by the lack of proper (exclusion) screens."

That report seems to have carried good information and a wise suggestion. Keeping the fish out of the canals seems like a no-brainer. But in the category of "the more things change, the more they stay the same," the problem of fish loss to irrigation canals persists today. One hundred and fourteen years seems to be quite a long time, don't you think?

In the spring when the rivers are — or are supposed to be — flush-full with mountain snowmelt and spring rain, the gates to the diversion canals are opened, and water enters the canals from the rivers and flows to the thirsty cropland. So far, so good, except for the cruel irony that the hot dry summers that create the greatest demand for irrigation water are also the summers when the rivers have the least water to give.

In the fall, after the canola has bloomed and the barley has ripened, the gates are closed and the canals dry up. The water remaining in scattered deep spots eventually freezes, and the fish perish. The technical term for this is entrainment and it's an issue today in many Alberta rivers, including the Oldman, Waterton and Belly. However, the focus of the problem has settled on the Bow River, particularly at the Carseland Headworks Canal, which withdraws water from the Bow near the town of Carseland.

Trout Unlimited Canada (TUC) conducts a volunteer-led fish rescue there each fall, catching stranded fish and returning them to the river before the tap is turned off. Since 1998 the rescues have returned 329,000 fish to the river from this



Westslope Cutthroat Trout are among the fish in Alberta with declining populations. Photo © Cows & Fish Riparian Management Society

canal alone. But here's the thing: the fish rescues take place on only approximately five kilometres of the canal. The canal is 66 kilometres long. And here's the other thing: a second diversion on the Bow — the Western Headworks Canal in Calgary — produced 115,000 fish for the rescues. Not all of these fish are sport fish. The others are “forage fish” that the sport fish eat, but every fish is an important cog in an ecosystem that has been disrupted and damaged. The trout rescues have saved many fish, but TUC acknowledges that these numbers represent just the “tip of the iceberg” on the matter of entrainment.

It's been suggested that the number of fish entering an irrigation canal is likely proportional to the amount of water diverted into the canal. Given that canals sometimes carry more water than is left behind in the river from which they came, it's an ominous prospect. No one knows precisely how many fish have been lost to irrigation canals in Alberta through the years, but on the Bow River alone the number appears to be approaching one billion.

Entrainment is also an issue in other parts of the world and has been successfully addressed with fish-exclusion devices that use physical structures, light, and sound to keep fish from entering the canals.

Except for screens at the Women's Coulee diversion on the Highwood River, no fish exclusion devices have been built in Alberta.

So why has this problem been identified, acknowledged and ignored for 114 years? This question is especially troubling now, when other cumulative pressures on fish populations have increased. In 2020, Alberta Environment and Parks (AEP) initiated the Bow River Cumulative Effects Modelling Group. It identified three major contributors to a decline in the population of mature Bow River trout: reduced and unstable flows, incidental mortality from catch-and-release angling, and entrainment. Subsequent to this, in 2022, provincial biologist Mike Sullivan said, “We learned two things from over 20 years of fish population data: young fish are consistently abundant in the Bow, but we have experienced rapid and high losses of older fish ... we generally see declines in young fish with habitat or disease issues. Big fish loss is almost always a harvest or entrainment issue.”

In the four years since the Cumulative Effects Modelling Group released its “three great stressors” report, the only one that AEP has suggested addressing is catch-and-release mortality, possibly through severely restrictive regulations on sport fishers. Perhaps predictably, this notion did not sit well with a significant portion of the Bow River fishing community, prompting the formation of the Trout Trust. Made up of people from different parts of Alberta, the group is concerned about the future of wild trout in Alberta, with entrainment as its initial focus. The Trout Trust and the AWA have a cooperative relationship and will share knowledge and resources to hopefully bring the entrainment issue to its obvious and necessary conclusion, which is to have exclusion devices installed to prevent fish from entering irrigation canals. 🍃



Westslope Cutthroat Trout.
Photo © L. Wallis

Question & Answer

with the Trout Trust

Jim asked Don McGarvey, one of The Trout Trust's founders, some questions about entrainment and The Trout Trust. Don is also an Edmonton lawyer with long-standing interest in water law in Alberta.

Q Was it ever a legal requirement for exclusion devices to be installed in Alberta's irrigation canals?

Within the Fisheries Act, there was an explicit requirement to have fish guards where the minister deemed necessary. In November 2013, this section was repealed. However, section 34.4 says the minister may deem it necessary to install a fish screen or guard to prevent the passage of fish. With the issuance of water licences, the licence holder is to be provided with specifications for fish screens to prevent entrainment. The Alberta Energy Regulator has the power to enforce and ensure compliance with the specifications. The fact that fish continue to be caught in the canals means that either the specifications are not preventing the problem or AER is not fulfilling its enforcement mandate. Either way, the system is failing to prevent entrainment.

Q What is the relevance of the July 2024 Report of the Auditor General into surface water management?

The findings of the Auditor General can fairly be said to be a damning indictment on the failure of the Department of Environment and Protected Areas to effectively manage water resources in Alberta. The inability to understand and monitor water allocation and use means that a solution to entrainment from within the department, without strong urging from outside the department, is unlikely.

Q What is the strategy of The Trout Trust and AWA?

Our first job is to raise awareness of the public on the issue of entrainment, unifying that voice, and taking it directly to the decision makers — government, irrigation districts, and those who hold the water licences — with the end goal that fish entrainment is properly and consistently prevented with the installation of exclusion devices. We believe that the fish should remain in the rivers. And we're not opposed to more restrictive angling regulations, if warranted; we just don't believe this should be the only response simply because it's the easiest change to make when the obvious issue of entrainment is staring us in the face, waiting to be fixed.

Q What should concerned people do?

Join The Trout Trust, become an AWA member, send letters of support, write to your MLAs, and relentlessly talk about the issue. This way you'll help strengthen the organizations and help us solve this problem.

A hundred and fourteen years is too damn long.