

# Alberta “Tackles” Fish Recovery in North-Central Eastern Slopes

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**A** new provincial effort – the North-Central Native Trout Recovery program – aims to recover threatened bull trout and other native fish such as Arctic grayling, mountain whitefish, and endangered Athabasca rainbow trout in the central-northern east slopes of Alberta.

It's no secret that Alberta has needed to see this action for decades. Alberta's coldwater fish have been in a lake of trouble for a long time: major declines began in the late 1800s to the early 1900s, when the first boom of settlers overfished streams and lakes throughout the province. Many species were overfished intentionally so that settlers could introduce fish species that they were familiar with such as rainbow trout, brook trout, and brown trout. Bull trout were considered to be *trash fish* because as predators they were thought to reduce the populations of other more 'desirable' species. As a result, many introduced species pushed out native fish or hybridized (bred) with them: rainbow trout hybridized with Athabasca rainbow trout, lake and brook trout aggressively overtook areas previously occupied by bull trout. For example, in 1973 the Abraham Reservoir contained only bull trout; by 2007 it was almost entirely (96.5%) populated by lake trout (Source: Government of Alberta Bull Trout Conservation Management Plan).

On top of all of this, as Alberta's population grew, the wild character of our Eastern Slopes suffered. Degrading and damaging these lands increased pressures on and accelerated the declines in populations. Alberta has a unique set of challenges when it comes to fish conservation: Alberta has substantially fewer lakes – hundreds compared

to hundreds of thousands in SK, MB, and ON. We also have the dubious honour of living in a province with the highest amount of industrial disturbance and road networks outside of the Maritimes. This disturbance causes widespread habitat destruction and degradation. With a growing population, this vast road network has meant that virtually no lake or stream is safe from human access by car or OHV. On top of all of this, the cold streams and lakes in Alberta are relatively unproductive, which means it takes a long time for our fish to grow and reproduce. Recovery is slow.

As you may imagine, it is incredibly challenging to recover trout in a resource-extraction obsessed province which also happens to have one of the highest concentration of anglers in the country. As a result, fisheries managers did one of the few things that were within their realm of control: changing fishing regulations. Some readers may remember that fishing regulations in the Eastern Slopes from the 1950s to the 1980s had alternating stream closures, so that 50 percent of streams were closed to fishing in any given year. However, these one-year rest periods were not enough to allow fish populations to recover. Fisheries management then shifted from alternating closures to widespread catch-and-release regulations for native fish, teaching a generally-receptive angling community to release the fish that belong and keep the ones that don't. These zero-bag limits prevented the complete collapse of native fish populations. But they did not lead to widespread recovery as they were not coupled with efforts to address other issues such as human popu-

lation growth, habitat degradation, habitat fragmentation, and poaching. All of these factors complicate any effort at restoring native fish populations.

Take bull trout, for example. The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) lists three main factors as responsible for the decline of bull trout: loss of habitat through degradation and fragmentation, hybridization and competition with introduced species, and overexploitation (overfishing). However, they cautioned that the degree to which each of these factors is contributing to decline should not be generalized and likely varies from watershed to watershed.

Provincial biologists have taken an important step towards understanding the relationship between these factors by creating a modeling tool. The model identifies the main threats facing bull trout in any given watershed and predicts how much bull trout will recover if these threats are addressed. The threats identified by the model are confirmed by field data.

The North-Central Native Trout Recovery Program will use this tool to triage recovery efforts from the central to the northern parts of the Eastern Slopes, beginning with a handful of watersheds. They picked watersheds which are at high risk, have a reasonable chance of recovery, and where restoration work (by government or industry) will be happening in the near future. After five years the government will assess the effectiveness of their recovery efforts. If successful, the government expects to expand the program to more watersheds.

The following areas have been chosen for

Watershed →	Kakwa River	Berland River	Pembina River	Lower Ram/ North Sask. River	Clearwater River	Upper Red Deer (Burnt Timber)	Pinto Lake
Threats to be addressed ▼							
Fish Mortality	→→	→→	→→	→→	→→		
Poaching	→→	→→	→→	→→	→→		→→
Habitat Fragmentation		→→	→→	→→	→→	→→	
Water Quality (sediment, OHVs, phosphorus)		→→	→→	→→	→→		
Competition w/ introduced species						→→	→→

Table: Watersheds included in the North-Central Native Trout Recovery Program, major threats to be addressed

recovery work: Kakwa River and all its tributaries, the upper Berland River and tributaries, Lower Ram River and the section of the North Saskatchewan River between Rough Creek and Prentice Creek, the upper Clearwater River and tributaries, the Pembina River, the upper Red Deer River, and Pinto Lake.

The government also proposes to address threats to fish recovery with the following actions:

lowing actions:

**Fish mortality and poaching** would be addressed by increasing enforcement and implementing fishing closures. These closures would prohibit Indigenous or Non-Indigenous fishing at any time of year. Catch and release fishing also would be prohibited during these closures.

**Habitat fragmentation:** Hanging culverts can act as barriers to fish and prevent them

from using their full range of habitat. Over the next five years, work to remove inappropriate barriers would be undertaken in the North Saskatchewan & Lower Ram, Clearwater, Berland, Pembina and the Upper Red Deer watersheds.

**Water quality:** Mitigation of point sources of sediment and phosphorous runoff such as roads, road crossings, areas of OHV disturbance and impacted shorelines.

**Competition with other species:** Suppression of non-native fish populations will occur in the upper Red Deer and Pinto Lake.

The public have expressed concern with aspects of the proposed North-Central Native Trout Recovery Program. What follows is my understanding of the program and the concerns that have been raised.

*“Trout are fairly adaptable creatures, but they simply can’t live in streams that flash flood in May, dry up in August, freeze solid in winter, or are polluted by storm-sewer runoff. And they most certainly can’t reproduce if spawning gravels are clogged with silt – provided they can even get there.”*

- Barry Mitchell,  
Trout Unlimited Canada, 1998.



Hanging culverts fragment fish habitat and deny fish access to the full range of their habitat. PHOTO: © J. SKRAJNY

There has been a general lack of transparency in this initiative. For example, why have these specific watersheds been chosen, and not others? Have these watersheds been selected because they are in most need of restoration work or because they will be the easiest to recover?

Taking a cursory look at the state of bull trout in the watersheds selected, it’s possible that the truth may be a little bit of both. Most watersheds selected have either low or very low current adult density of bull trout (translate: have a high or very high risk of being extirpated in those watersheds). There is also a strong case to be made for putting some pro-active recovery work in areas where the situation is not as dire. Greater clarity regarding how these watersheds were selected is needed.

The proposed fishing closures in these watersheds have been contentious. The government has not been proactive in providing information about how they made their choices. There are valid concerns that need thoughtful answers. Will these closures increase pressures on surrounding watersheds? Will the loss of eyes on the landscape increase poaching?

While not directly related, the proposed closures bring to mind the growing body of research about no-fishing zones and marine protected areas (MPAs). In general, MPAs result in rapid increases in fish populations and fish size, as well as increases in biodiversity. As the populations of fish grow larger, fish migrate out and “spillover” into the area that is harvested. It has been found that there are increases in the number of fishers in the area surrounding the boundaries of an MPA. In some instances, the spillover of fish into surrounding areas is enough to keep populations stable, in other cases enforcement and management of fishing activities around boundaries have to be controlled in order to prevent population decreases. In MPAs established off the coast of Newfoundland

it was found that illegal harvesting of fish occurred on some level, but engaging community support and increasing enforcement played a large role in solving the poaching issue. In general, results could be seen in as little as three years, but the more depleted a fishery was, the longer it took to recover populations.

Now clearly, there are some marked differences here – the most obvious being we are dealing with streams and lakes, not seas and oceans – but it does provide evidence that fishing closures in some ecosystems are successful in recovering fish. Again, it would be good to know what the province is planning to do in order to help manage some of these impacts and what research exists for freshwater fish species.

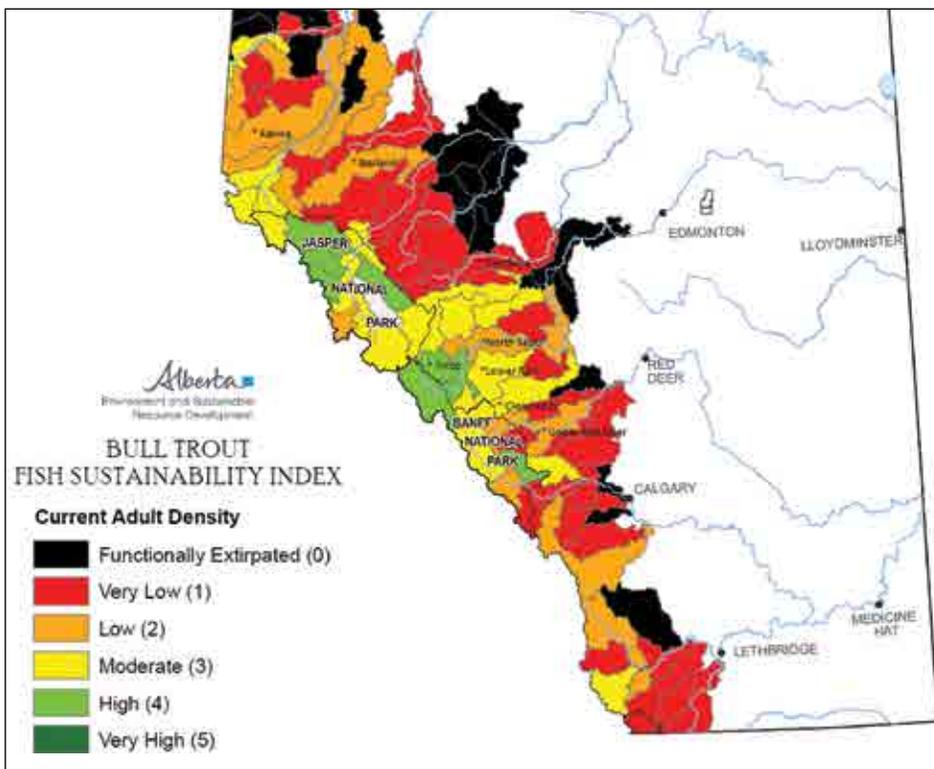
Some anglers feel they are being progressively restricted despite acting responsibly and practicing catch and release faithfully. They’re not wrong – the North-Central program clearly intends to use closures to further reduce fishing pressure and mortality. The program’s rationale for these additional angling restrictions comes from its conclusion that “over the past 20 years, efforts to

restore fish populations by implementing catch-and-release fishing regulations and other management actions have mostly failed.” We have tasted these failures before. In December 2003, right here in the *Advocate*, Dr. Michael Sullivan described a scenario where mandatory catch and release would contribute significantly to mortality in the walleye fishery: “For example, recovering walleye fisheries like Bapiste Lake may attract 10,000 anglers in a summer. The sustainable harvest is likely no more than 1,000 fish. How do you divide 1,000 fish amongst 10,000 anglers? Once minor problems like catch-and-release mortality (usually as low as five to ten percent) have now become major sources of the annual kill when multiplied by the heavy angling pressure.” (Vol. 11, no. 6)

Angling expertise goes a long way to reducing mortality. We also know that catch-and-release related fish deaths increase dramatically under higher water temperatures. With climate change, summers such as the one we just had will increase fish stress and mortality. Even though the province currently closes areas to fishing when temperatures get too high, more guidelines and restrictions on fishing to address temperature issues may be needed in the future.

In order to reduce mortality the plan has also rejuvenated calls for mandatory education programs and for limiting the number of fishing licenses issued in any given year. Mandatory education programs are incredibly important – it’s pretty obvious that if you’re allowed to eat fish x but have to release fish y, you better know the difference between the two! The exact impacts of misidentification, while unknown are thought to be significant, especially for species such as bull trout which are notoriously easy to catch and more vulnerable to overfishing. It only takes a couple of anglers mistakenly identifying a bull trout as a brookie and several bad catch and release handlings to undo in a day what skilled anglers could sustainably fish forever.

While the percentage of licensed anglers in Alberta is stable (seven percent in 1999 and 2016) more than 90,000 more licenses were



Current density of bull trout in Alberta. A low adult density means there is a high risk of losing these populations in the near future. Asterisks\* mark the locations of watersheds for proposed recovery work. CREDIT: GOVERNMENT OF ALBERTA

issued in 2016 than were issued in 1999. Given the sad state of many of our fisheries should we be issuing nearly 300,000 fishing licenses? Can we recover and establish sustainable fisheries with a growing absolute number of anglers? The answer is likely “no”: a paper in the *Journal of Fisheries Management* published in 2002 warned that Alberta would face unrecoverable collapses in fisheries unless serious restrictions were placed on anglers and recommended a lottery system to reduce the amount of fishing pressure in the province.

The final, and perhaps greatest, concern is that the commitments to restore habitat fragmentation and improve water quality focus on issues such as hanging culverts, road crossings, and OHV trails. Stronger commitments to limit industrial development or protect habitat appear to be absent. Indeed, ongoing habitat destruction in trout habitat

is incredibly concerning. A commitment to address sedimentation at road crossings while continuing to build more roads (thus causing more sediment, OHV use, and access to streams) is completely illogical and may undo any other efforts made.

Habitat loss and degradation, even if not directly killing fish, places them under stress and makes them less resilient to climate change, competition with introduced species, and angling pressures. Addressing all other causes for fish decline without restoring and protecting habitat is a lot like managing symptoms without treating the root cause of the disease.

While it is relatively easy to cause widespread collapses of fish populations, it will take a lot more serious intervention in order to fix years of neglect by the government. There is no quick fix or simple answer. One approach will not be enough – many

problems will have to be tackled simultaneously on landscapes that are plagued with problems. It's clear these recovery actions will have to be coupled with landscape restoration and habitat protection in order to ensure that recovery is permanent.

Despite these challenges, it appears that for the first time in decades, there are solid plans for action that will allow native fish a chance to recover and once again thrive in these watersheds. The government expects that after the five-year rest period, there will be significant increases to fish population numbers in these watersheds. If the government has the data and scientific rationale behind their decisions, they need to make that clear to all of us and we can in good faith let them show us what they can do. A successful result would be a win for all. 🐟



*Does it really need to be said that situations like this in the backcountry severely damage water quality and fish habitat? PHOTO: © W. HOWSE*