

## BOW RIVER TROUT POPULATIONS COULD WELL BE IN DECLINE A NEED FOR A CHANGE IN FISHERY MANAGEMENT.

### Introduction:

The Bow River is a world-renowned trout sports fishery that is under pressure from the human population growth in the region, ever-increasing demand for outdoor recreational pursuits, environmental changes and degradation of aquatic and riparian habitat. Fishery managers have monitored the Bow River for more than 30 years, and in this time, it has been demonstrated that up until 2003 the fishery was sustainable with proper regulatory constraints. More recently though we have seen dramatic changes to the Bow River with devastating floods, low river flows in the warmest seasons, higher summer temperatures and now the presence of Whirling Disease.

A recent report <sup>(4)</sup> indicated that Bow River trout populations are in trouble. Data analysis showed that the Rainbow Trout populations may have declined by as much as 50% over a ten-year period from 2003 to 2013. This is a disturbing trend that needs immediate attention by all stakeholders involved. The following documents the historical fish population surveys which at that time supported a sustainable fishery. The recent Rainbow Trout population analysis is also reported.

### Summary of Bow River Trout Population Estimates 1980 to 2005

Trout population data was collected by electrofishing a 4Km section of the Bow River downstream of Policeman's Flats. A total of 3 or 4 days of sampling was conducted in August or September each year. A considerable amount of data was analyzed using a variety of statistical models and generally the population estimates are considered to be reliable with 4-day sampling techniques <sup>(1)</sup>

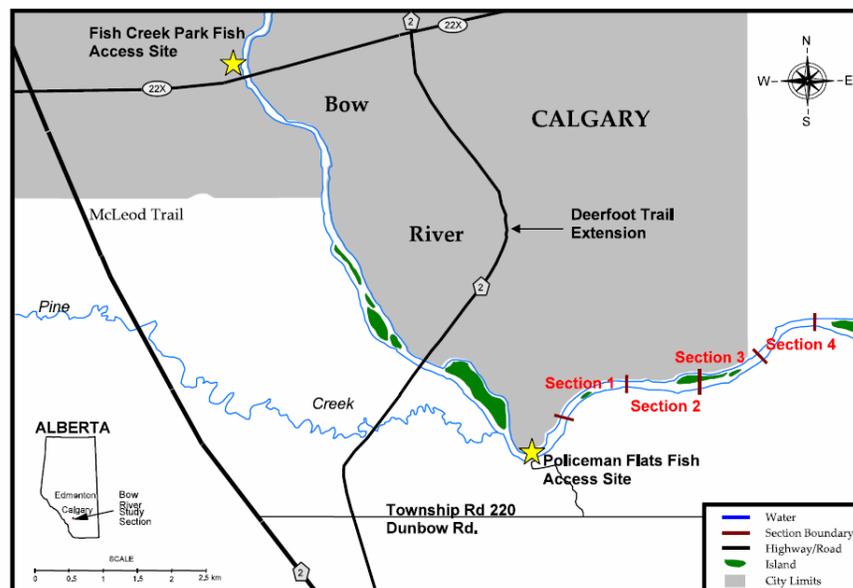
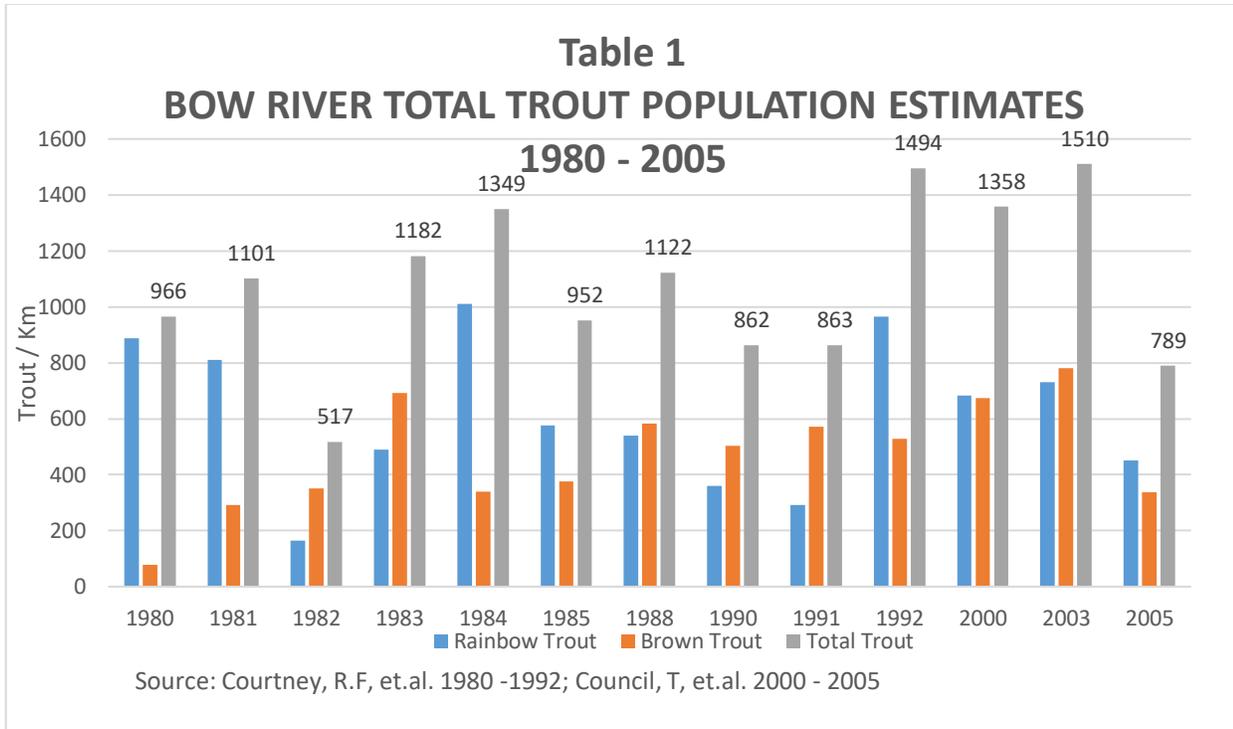
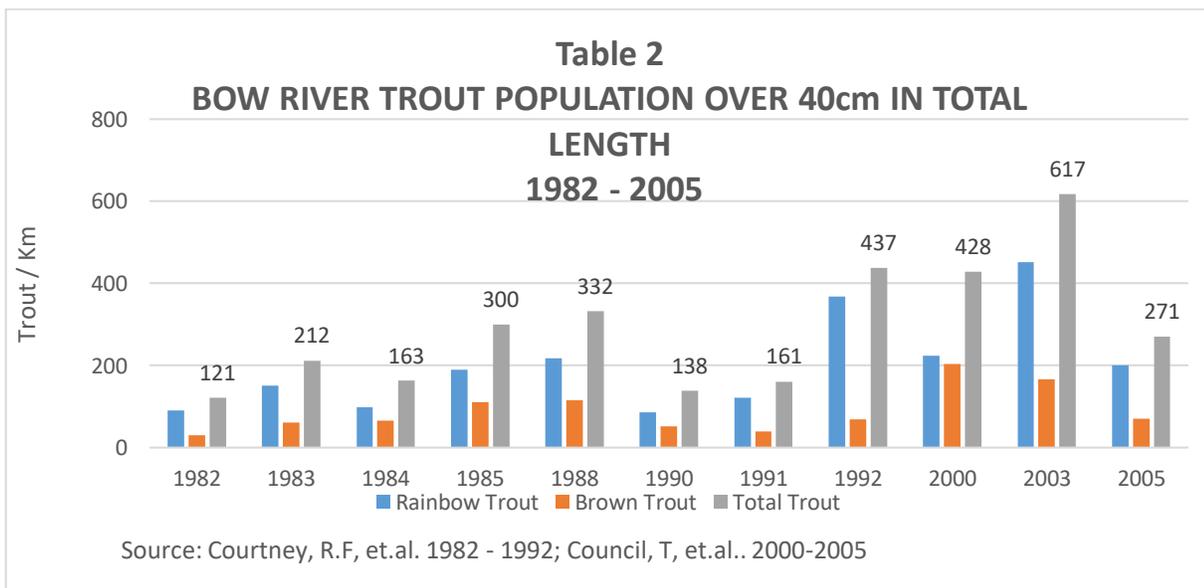


Figure 1. Map of the 4-km study area on the Bow River surveyed in 2003 and 2005.

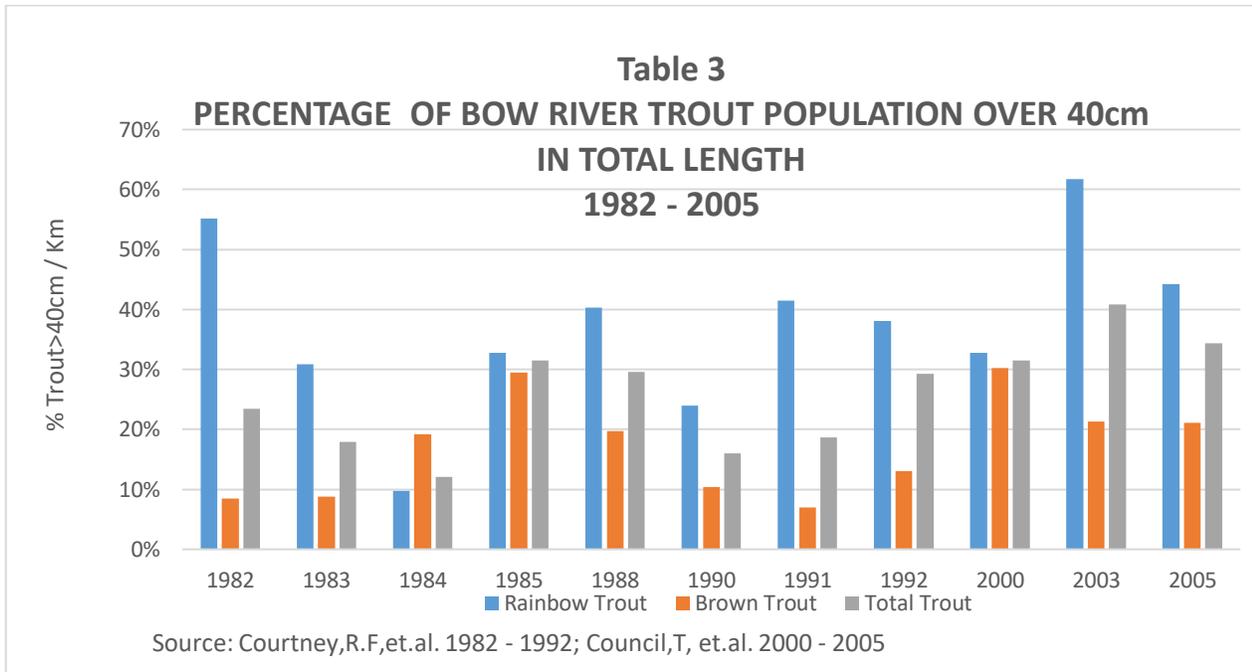
The following tables document trout populations from 1980 to 2005



The variations in yearly trout population in the Bow River are more than likely due to a combination of sampling techniques, river flow rates and spawning success in previous years<sup>(1)</sup>. This is most noticeable with spring spawning of rainbow trout where they may be subject to the impact of spring runoff in the Highwood River drainage. Conversely, Brown Trout spawn in the fall of the year when there are more consistent river flows. It has been suggested that the dramatic drop in 2005 trout population could be contributed to the spring flood of that year<sup>(2)</sup>



The Catch-and-Release Restriction on the Bow River where trout of more than 40cm (16in) in length must be released impacts the number of mature fish available to reproduce. In addition, the Bow River is a prized destination fishery where larger fish can be caught. It is therefore important to monitor the mature fish population. Table 2 shows the variation between years as reported previously. Table 3 illustrates the percentage of trout that exceed 40 cm in length. It was encouraging to see relatively stable numbers during this time.



Additional fish population data was collected by the Alberta Conservation Association in 2007 <sup>(3)</sup> that indicated trout populations had returned to historical norms following the 2005 flood with numbers of total trout at 1665 / Km, rainbow trout 1035/Km and brown trout 600/Km. These data were used to suggest that there is a sustainable trout population in the Bow River. Unfortunately, the routine of fish population surveys every two to three years was not continued leaving the fishing community speculating in recent years on Bow River trout populations.

## Bow River Trout Population Decline.

The provincial government did conduct sporadic fish population sampling and surveys from 2007 onwards but did not use the same methodology that had been used in previous years. An assumption was made that the original study area was representative of the Calgary to Carseland stretch of the Bow River, but there are significant differences in fish habitat above and below the mouth of the Highwood River. Therefore, expanding the survey areas to the lower sections of the river would give a more comprehensive assessment of the Bow River trout populations.



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Furthermore, the 2013 Bow River flood had a dramatic impact on the Bow River hydrology, fish habitat and a perceived drop in the trout populations. The anecdotal evidence has been that the rainbow trout population was the most effected by the flood. In addition, Whirling Disease was identified in the Bow River Basin in 2016, its time of introduction into the river was unknown. Low river flows and higher water temperatures prompted the Alberta Government to close the Bow River to angling for two weeks in 2015. Therefore, the dynamics of the fish population were unclear.

Alberta Environment & Parks contracted the Department of Biological Sciences, University of Calgary <sup>(4)</sup> to conduct an analysis of rainbow trout capture-recapture survey data collected by the Alberta government during 2003-2013. The analyses showed a rather alarming population decline during this timeframe:

- An analysis of 2003 – 2008 data indicated that there was a **5.6% annual decline in rainbow trout populations – or 43% decline over the 10-year period of 2003 to 2013**
- An analysis of 2003 – 2013 data indicated that there was a **6.8% annual decline in rainbow trout populations - or 50% decline over the 10-year period of 2003 to 2013**

Although there is a need to be careful with the interpretation of these data, it is nevertheless an indication that the Bow River fishery is could well be in decline and potentially headed in a very dangerous direction. Alberta Environment & Parks fishery managers have recognized the need to take action to stop a continued decline, but before doing so there is a need for continued Bow River fish population monitoring to establish a bench mark for whatever action can be taken.

The Bow River Trout Foundation's purpose is to advocate and support the Bow River fishery. We are committed to support the government or take a lead role in research and development for the enhancement of the fishery. The dynamics of a sustainable fish population as well as monitoring fish populations needs to be investigated. Bow River Trout Foundation will support such initiatives.

### References:

1. Courtney, R.F. 1993. Bow River trout population studies, 1992. Alberta Forestry, Lands and Wildlife, Fish and Wildlife Division, Red Deer, Alberta. 42 pp.
2. Council, T., and T.D. Ripley. 2006. Bow River sport fish population monitoring, 2003 and 2005. Data Report, D-2007-006, produced by the Alberta Conservation Association, Lethbridge, Alberta, Canada and Alberta Fish and Wildlife, Calgary, Alberta, Canada. 34 pp. + App
3. Blackburn, J., Council, T., Hurkett, B. 2008. Bow River Fish Population Monitoring. Project Summary produced by the Alberta Conservation Association, Lethbridge, Alberta, Canada and Alberta Fish and Wildlife, Calgary, Alberta, Canada.
4. Cahill, C., Mogensen, S.M. Wilson, K.L. Cantin, A. Sinnatamby, N. Post J.R. 2018. Multiple challenges confront a high-effort recreational fishery in decline. Bow River Basin Council Science Forum, May 2, 2018

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