**Alberta Conservation Association**
**2009/10 Project Summary Report**

**Project Name:** *Crowsnest Drainage Sport Fish Population Assessment – Phase 1*

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**Project Leader:** Jason Blackburn and Trevor Council

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**Partnerships**

Alberta Sustainable Resource Development
Devon Canada Corporation

**Key Findings**

- Of eight salmonid species electrofished in the Crowsnest River, Rainbow Trout and Mountain Whitefish comprised the majority of the catch at 55% and 40%, respectively (n = 598 and 441).
- Legal-harvest-sized fish represented 14% (n = 83) of the Rainbow Trout captured, and 45% (n = 157) of the Mountain Whitefish measured (n = 328).
- Average incidence of hooking damage on legal-sized Rainbow Trout was 17.4% (range = 0 – 32.3%) of the catch, and 5.1% (0 – 7.8%) of the Mountain Whitefish measured.
- Sampling intensity for summer 2010 will include 21 sites on the Crowsnest River and 40 sites on its tributaries.

**Introduction**

The Crowsnest River is considered one of the most popular trout fisheries in Alberta. However, increased angling pressure, habitat degradation from recreational and industrial activities, and invasion of other, less popular, introduced species threaten the fishery. Native Mountain Whitefish (*Prosopium williamsoni)* and Rainbow Trout (*Oncorhynchus mykiss*) are considered the most numerous species in the sport fishery. The historical sport fish assemblage once included Bull Trout (*Salvelinus confluentus*) and Westslope Cutthroat Trout (*Oncorhynchus clarkii lewisi*); however, Cutthroat Trout have been displaced (Alberta Sustainable Resource Development (ASRD) and Alberta Conservation Association (ACA) 2006) and are now restricted to select tributaries (Taylor and Gow 2007). Similarly, the historical range of Bull Trout has been reduced to below Lundbreck Falls (ASRD and ACA 2009). Other species introduced into the drainage in

the 1960s include Brook Trout (*Salvelinus fontinalis)*, Brown Trout (*Salmo trutta*) and Lake Trout (*Salvelinus namaycush*. This year, our primary objective was to determine sampling intensity, site locations and study area boundaries in preparation for the second (and final) year of the study. We plan on completing a comprehensive drainage-level assessment enabling us to calculate trout abundance and density in year two.

**Methods**

We queried archival data from the Alberta Government database (FWMIS) and summarized fish species distribution and relative abundance information to identify data gaps and prioritize preliminary sampling. Using a tote-barge electrofisher, we collected fish data at five sample sites representing the upper, middle and lower reaches of the Crowsnest River main stem. Fish were identified to species, measured, weighed, assessed for hooking-damage, and released. Sites ranged in length from 350 – 800 m. Using our 2009 field data and archival datasets, we conducted a power analysis to determine sampling intensity for summer 2010. We also identified tributaries where native Cutthroat Trout and Bull Trout are likely to persist. We defined our study area based on trout presence and systematically arranged sample locations within it using geographic information system (GIS) software. Sampling methodology for summer 2010 was determined based on 2009 field reconnaissance and preliminary eletrofishing results.

**Preliminary Results**

Our total catch of salmonid sport species was 1,096 fish. Rainbow Trout and Mountain Whitefish accounted for the majority of the catch at 55% and 40%, respectively (n = 598 and 441). An additional six species of trout accounted for the remaining 5% of the catch (Table 1).

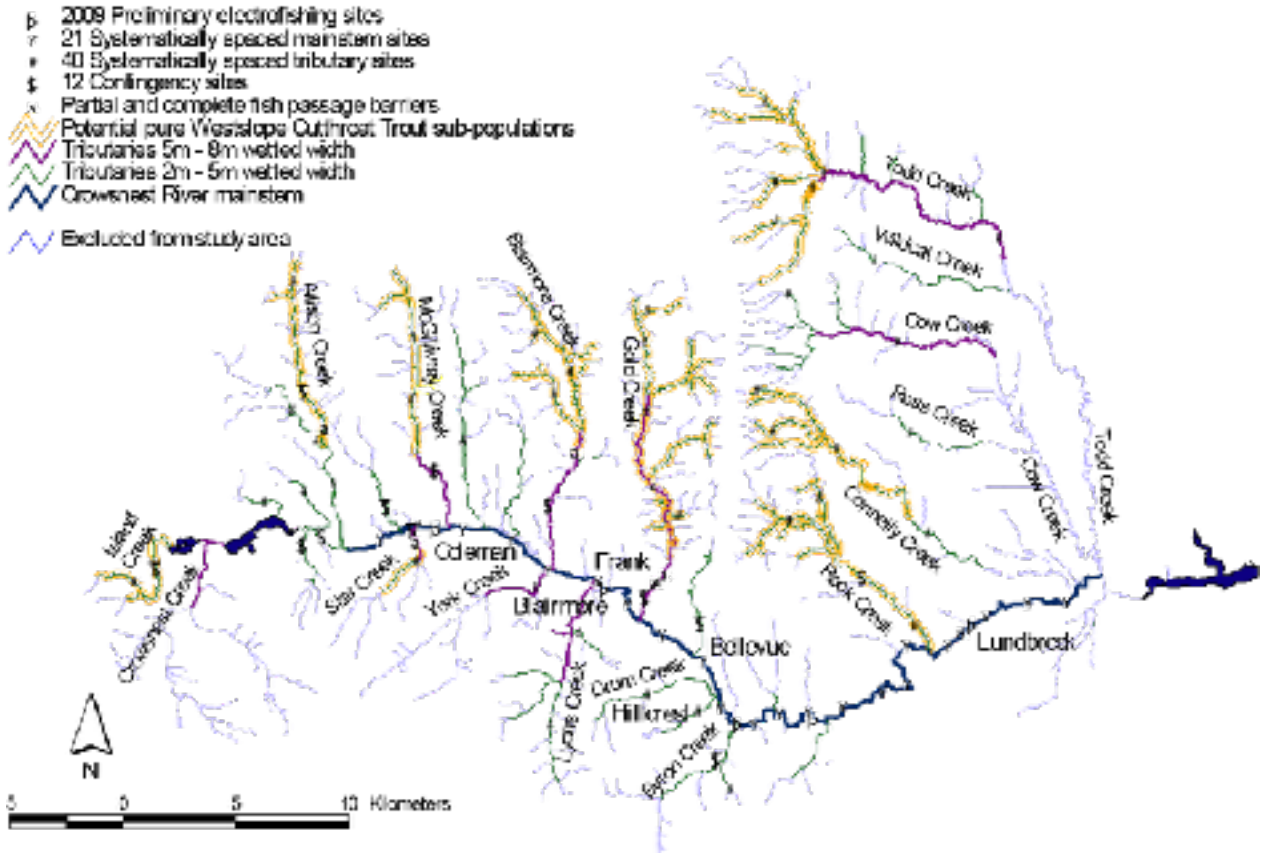
Table 1. Catch summary of Salmonid sport species and respective fork-length (FL, mm) size ranges.

| Species | Total Fish Captured | Percentage of Catch | Min FL | Mean FL | Max FL | SD FL |
|---|---|---|---|---|---|---|
| Brook Trout | 5 | 0.5 | 72 | 182 | 330 | 96.8 |
| Bull Trout | 12 | 1.1 | 230 | 374 | 517 | 87.9 |
| Brown Trout | 31 | 2.8 | 111 | 147 | 327 | 47.3 |
| Cutthroat x Rainbow Trout hybrid | 7 | 0.6 | 83 | 189 | 339 | 100.6 |
| Cutthroat Trout | 1 | 0.1 | 340 | 340 | 340 | NA |
| Lake Trout | 1 | 0.1 | 332 | 332 | 332 | NA |
| Mountain Whitefish | 441 | 40.2 | 65 | 259 | 451 | 104.4 |
| Rainbow Trout | 598 | 54.6 | 68 | 174 | 453 | 94.7 |
| Sum | 1,096 | 100.0 | | | | |

Native trout species (i.e., Bull Trout and Westslope Cutthroat Trout) represented less than 2% of our catch and were only captured downstream of Lundbreck Falls. Of the 598 Rainbow Trout captured, 14.4% (n = 86) were of legal-harvest-size (>300 mm total length), while 45.1% (n = 157) of the Mountain Whitefish measured (n = 328) were legal-harvest-size. Across the five survey sites, hook-damaged fish represented 17.4% (range = 0 – 32.3%; n = 15) of the legal-harvest-sized Rainbow Trout and 5.1% (range = 0 – 7.8%; n = 8) of the legal-harvest-sized Mountain Whitefish. From power analysis we concluded that a sampling intensity of 21 sites on the Crowsnest River main stem would be required to achieve a relative standard error (RSE) within 30% of the population mean. We determined main stem study area boundaries as downstream of the Allison Creek confluence to the mouth of Todd Creek (Figure 1), sampling method to be tote-barge electrofishing, and site length to be 40 times the mean wetted width. We also estimated that tributary sampling intensity should be 40 sites (RSE 47%), and the study area should include all fish-bearing streams of 3rd order (Strahler) and larger occurring west of Highway 22; backpack electrofishing will be the sampling method at sites ranging from 150 to 300 m in length.

Figure 1.

Figure 1. Sample Site Arrangement and Study Area Boundaries for 2010 Crowsnest Drainage Sport Fish Population Assessment




## Conclusions

A total of 61 sites, 21 on the Crowsnest River and 40 on the tributaries, will be electrofished in summer 2010. Trout abundance and density totals will be calculated after 2010 field sampling is complete.

## Communications

- Provision of information to ASRD upon project completion.
- Presentation of project results to the Oldman Chapter of Trout Unlimited and at the Southern Rockies Area Fisheries Roundtable meeting.
- Newspaper articles in the *Crowsnest Pass Promoter* and *Waterton Boundary News* to highlight project results.

## Literature Cited

Alberta Sustainable Resource Development and Alberta Conservation Association. 2006. Status of Westslope Cutthroat Trout *(Oncorhynchus clarkii lewisi)* in Alberta. Alberta

Sustainable Resource Development, Wildlife Status Report No. 61, Edmonton, Alberta. 34 pp.

Alberta Sustainable Resource Development and Alberta Conservation Association. 2009. Status of Bull Trout *(Salvelinus confluentus)* in Alberta. Alberta Sustainable Resource Development, Wildlife Status Report No. 39, Update 2009, Edmonton, Alberta. 48 pp.

Genereux, D.B., and M.B. Bryski. 2002. A creel survey of the Crowsnest River, June – September, 2001. Prepared for Alberta Environmental Protection, Natural Resources Service, Lethbridge, Alberta. 32 pp + App.

Taylor, E., and J. Gow. 2007. An analysis of hybridization between native Westslope Cutthroat Trout (*Oncorhynchus clarkia lewisi*) and introduced Yellowstone Cutthroat Trout, *(O.c. bouvieri*) and Rainbow Trout (*O. mykiss*) in Canada's Mountain Parks and adjacent watersheds in Alberta. Prepared for Parks Canada and Alberta Fish and Wildlife. University of British Columbia, Native Fishes Research Group, Vancouver, British Columbia. 46 pp.

Photo Captions

| | |
|---|---|
| **Name** | Burmis_1 |
| **Title** | Crowsnest River near Burmis. (Photo: Brad Hurkett) |

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|---|---|
| **Name** | Damage_2 |
| **Title** | Mountain Whitefish (*Prosopium williamsoni*) with maxillary hooking damage. (Photo: Mike Jokinen) |

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| **Name** | rntr_3 |
| **Title** | Dipnet full of Rainbow Trout (*Oncorhynchus mykiss*) electrofished near East Hillcrest. (Photo: Mike Jokinen) |

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|---|---|
| **Name** | Revive_4 |
| **Title** | Reviving a Rainbow Trout (*Oncorhynchus mykiss*). (Photo: Mike Jokinen) |