

Alberta Conservation Association 2010/11 Project Summary Report

Project Name: *Stream Crossing Remediation*

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Key Findings

- Reviewed all ACA stream crossing information collected to date and developed a prioritized list of problem culverts to be targeted for remediation.
- Of the five watersheds assessed, the Swan River had the greatest number of stream crossings with potential fish passage barriers (74%, n = 351).

Introduction

Arctic grayling (*Thymallus arcticus*) populations in Alberta have been severely declining since the 1950s, primarily due to habitat fragmentation resulting from improperly installed or hanging culverts (Alberta Sustainable Resource Development (ASRD) 2005). To generate information that will aid in mitigating these declines, Alberta Conservation Association (ACA) has conducted stream crossing inventory surveys on several watersheds including the Simonette, Kakwa, Notikewin, Swan and Upper Athabasca rivers. Our data on the Simonette and Kakwa watersheds has proven valuable to both industry and regulatory agencies in raising awareness about the potential impact culverts have on fish passage, improving in-house monitoring and capitalizing on remediation opportunities. However, overall remediation activities to mitigate fish habitat fragmentation are either minimal or non-existent in some watersheds. Our goal was to review all ACA stream crossing information collected to date and develop a prioritized list of problem culverts to be targeted for remediation and use this information to actively solicit funding from crossing owners or other interested stakeholders.

Methods

We analysed stream crossing inventory data from five northern watersheds that shared similar crossing inventory data collection protocols and data formats. We standardized the crossing inventory data and developed a site prioritization process based on the following ranking criteria: stream order, fish presence at crossing, proximity to fish-bearing water and quantity of upstream habitat above barrier. We excluded sites with low to no water flow and crossings that contained fish passage barriers (e.g., beaver dams) other than hanging outlets during the time of the field assessment. Lastly, we generated a final prioritized crossing remediation list and identified crossing ownership.

Results

Of the five watersheds assessed, the Swan River had the greatest number of stream crossings with potential fish passage barriers, followed by Notikewin, Kakwa, Upper Athabasca and Simonette, respectively (Table 1). We calculated that 574 km of linear stream habitat is inaccessible to fish in the Swan River watershed due to hanging culverts. The remediation ranking process identified key problem crossings to target for remediation (Table 2). If fixed, these crossing will have the greatest impact on fish passage and watershed connectivity.

Table 1. Proportion of stream crossings inventoried in each watershed that are potential fish barriers.

Watershed	Potential fish barriers (%)	N
Swan	74	351
Notikewin	61	413
Kakwa	57	75
Upper Athabasca	34	397
Simonette	33	406

Table 2. Top two problem crossings in each watershed to be targeted for remediation.

Watershed	Culvert #	Stream Order	Fish presence at crossing	Upstream habitat above barrier (km)
Swan	275	4	no	27.8
	447	4	no	23.0
Notikewin	18	3	no	16.3
	51	3	no	15.2
Kakwa	28	3	no	13.6
	93	3	no	4.7
Upper Athabasca	330	5	yes	140.1
	73	4	yes	30.6
Simonette	379	3	no	19.6
	271	2	no	6.9

Conclusions

We identified critical crossing sites to improve fish passage and watershed connectivity. With this information, crossing owners can focus culvert assessments and remediation efforts.

Communications

- Presentation on our stream crossing remediation project to the Foothills Stream Crossing Program and potential partners.

- Distributed prioritized list (with ownership removed) of crossings to target for remediation to Fisheries and Oceans Canada.

Literature Cited

Alberta Sustainable Resource Development. 2005. Status of Arctic grayling (*Thymallus arcticus*) in Alberta. Alberta Sustainable Resource Development Fish and Wildlife Division, and Alberta Conservation Association. Wildlife Status Report No. 57, Edmonton, Alberta. 41 pp.