Alberta Conservation Association
2017/18 Project Summary Report

Project Name: Mountain Whitefish Overwintering Habitat

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Partnerships

Alberta Environment and Parks
Alberta Innovates
Department of Fisheries and Oceans
Millar Western Pulp Mill

Key Findings

- We surgically implanted 54 mountain whitefish with radio telemetry tags in September and released back into the McLeod River.
- Monthly aerial surveys from November to January have located 52 of the 54 tagged fish.
- Tagged fish travelled between 9 km upstream and 89 km downstream from initial tagging locations, with most fish moving in a downstream direction.

Introduction

In 2014/15, the Wapiti River Water Management Steering Committee, in collaboration with Alberta Environment and Parks, identified several knowledge gaps in the instream flow needs (IFN) required to develop a robust water management plan for the river. Specifically, the committee had limited temporal data on under-ice fish habitat availability and use. As such, a telemetry study was completed to determine overwintering areas and microhabitat characteristics for mountain whitefish in the Wapiti River (Van de Vosse 2015). Mountain whitefish were selected as a species of focus due to their prevalence and ecological importance in mainstem rivers of the Eastern Slopes, their interest and value to stakeholders, as well as their tendency to occupy areas of faster moving water, which could make them more susceptible to changes in flow. The resulting IFN models from the study suggested that this species may be especially sensitive to low winter flows, which could greatly influence water management decisions (Andrew Paul, AEP, Pers. Comm.).

ACA, in collaboration with AEP, seeks to validate the IFN models developed in 2014-15 for mountain whitefish using the McLeod River, and further build on our understanding of under-ice habitat use and availability for this species. The results will allow for a broader application of mountain whitefish IFN across the Eastern Slopes of Alberta, and help inform management decisions with respect to water allocations and withdrawals.

Methods

Between September 18 and 20, 2017, we captured 93 mountain whitefish using a boat electrofisher within two reaches of river (Rosevear Ferry and Hwy 32), located approximately 18 kilometres apart. We surgically implanted radio tags into 54 suitable mountain whitefish (fork length range: 211 to 455 mm; weight range: 201 to 1,219 g) with Lotek Wireless Inc. MST-930 radio tags. Following surgery, we transferred fish to an aerated tote for recovery and released back at the capture location.

We conducted aerial telemetry surveys on November 3, December 5, and January 11, starting at the mouth of the McLeod and finishing 160 kilometres upstream. Surveys were completed via helicopter, outfitted with an H-antenna, receiver (Lotek SRX-400) and GPS. We also installed a fixed receiver (SRX-600 with 4-element Yagi antenna) at the mouth of the McLeod where it meets the Athabasca to monitor if any fish exit the McLeod.

Aerial surveys will continue in February and March of 2018, and will be accompanied by ground surveys. Ground surveys will be used to collect microhabitat data (velocity, depth, substrate, water quality) at tagged fish locations, as well as at randomly selected points, to determine habitat use and availability data for instream flow needs modelling.

Results

Of the 54 radio tagged fish, we located 49 in November, 46 in December, and 51 in January. Between the three surveys, we have accounted for 52 of 54 fish. Possible explanations for undetected tags include fish mortality, tag failure or tag clustering. Total distance travelled from initial tagging locations varied from nine kilometres upstream to 89 kilometres downstream, with fish travelling an average of 17 kilometres downstream (Figure 1). Fish moved greater distances from September to November, with movement slowing from November to January. We have not detected any tagged fish movement from the McLeod into the Athabasca River.

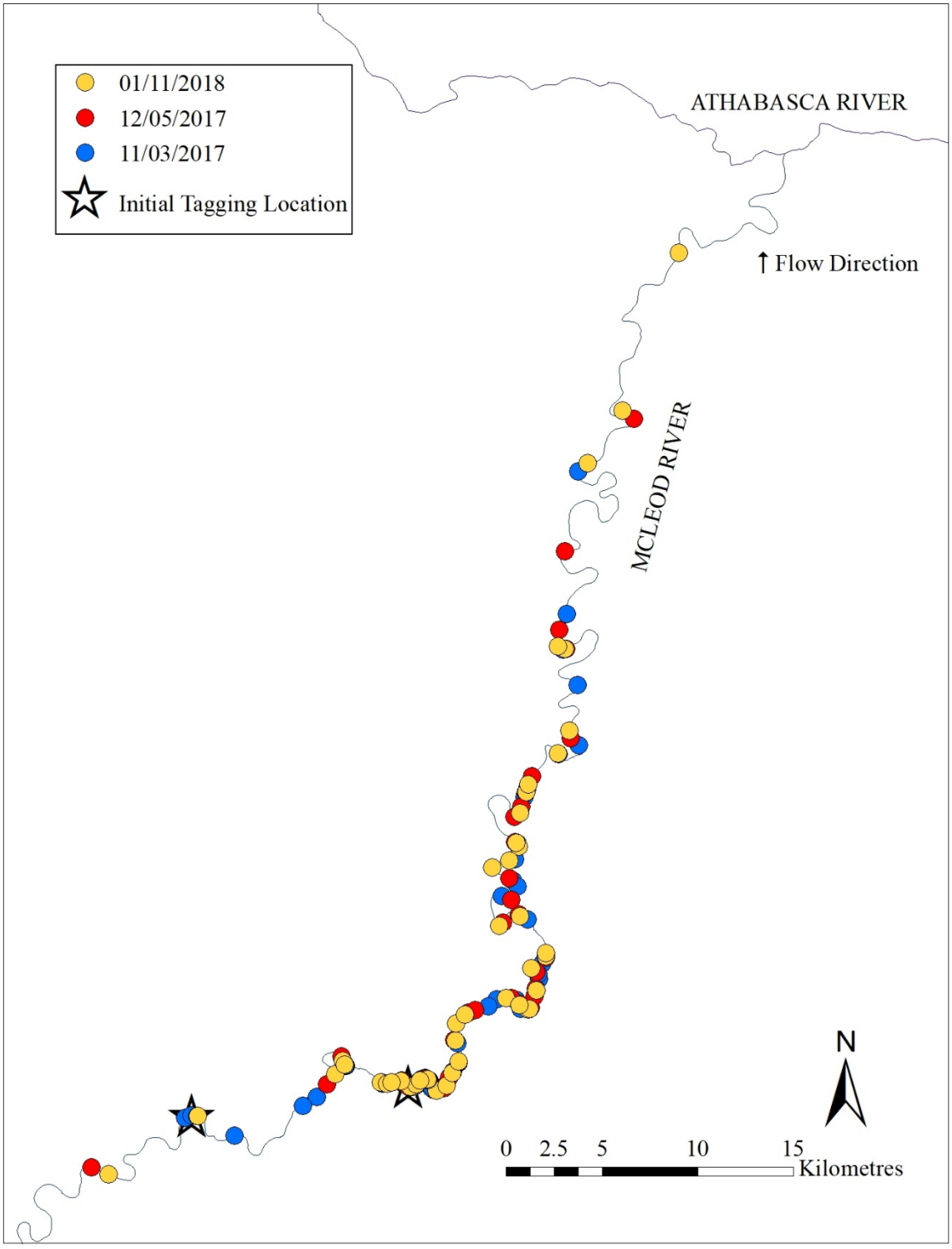

Figure 1. Locations of tagged mountain whitefish in the McLeod River determined using aerial telemetry in November and December 2017, and January 2018.

Conclusions

We tagged 54 mountain whitefish in the McLeod River, and have been tracking their movement since September. Fish have travelled up to 89 kilometres from their initial tagging locations, mostly in a downstream direction. We will continue to monitor their movement using monthly aerial surveys, and complete our ground surveys and habitat data collection in February and March.

Communications

- ACA Project Progress Report
- Progress report for Alberta Innovates April 2018

Acknowledgement
Funding for this project provided by Alberta Innovates and Department of Fisheries and Oceans.

Literature Cited

Van de Vosse, H. 2015. Wapiti River Fish Telemetry Program – Final Summary Report. EDI Environmental Dynamics Inc.

Photos

Surgical implantation of radio tags into mountain whitefish. Photo: Britt Schmidt

Telemetry equipment in use during an aerial survey. Photo: Britt Schmidt

Alberta Conservation Association Biologist, Mike Ranger, practicing radio telemetry techniques. Photo: Britt Schmidt

Fixed telemetry receiver set up at the mouth of the McLeod River. Photo: Britt Schmidt