Alberta Conservation Association
2011/12 Project Summary Report

Project Name: *Inventory of Sport Fish in the Edson River*

Fisheries Program Manager: Peter Aku

Project Leader: Jason Blackburn

Primary ACA staff on project:

Jason Blackburn, Troy Furukawa, Brendan Ganton, Patricia Halinowski, Brad Hurkett and Bill Patterson

Partnerships

Alberta Sustainable Resource Development
Fisheries and Oceans Canada

Key Findings

- Total fish biomass dominated by mountain whitefish and sucker species.
- Fish biomass linked to riparian health score and bank stability.
- Species richness higher at sites with healthy riparian areas.
- Mountain whitefish was the most widely distributed and frequently captured sport fish.
- Rainbow trout and Arctic grayling were distributed throughout the study area.

Introduction

In the Edson River watershed, habitat fragmentation and degradation as a result of industrial activities, agriculture and livestock operations, residential expansion and stream crossing barriers pose considerable threat to the fish community, particularly Athabasca rainbow trout (*Oncorhynchus mykiss*) and Arctic grayling (*Thymallus arcticus*) that were previously abundant throughout the watershed (Bryski 1999). Rainbow trout have receded in distribution toward headwater areas and Arctic grayling are nearing extirpation (G. Sterling, Alberta Sustainable Resource Development pers. comm.). In 2010, we initiated a riparian conservation project in the Edson River watershed to protect and restore riparian areas with the ultimate goal of facilitating recovery of the sport fish community, particularly Athabasca rainbow trout and Arctic grayling. The goal of this study is to collect baseline data on distribution and abundance of sport fish in the system for measuring responses to future restoration activities.

Methods

During the summer of 2011 we conducted fish inventory and habitat surveys at 28 reaches along the Edson River using a three-person cataraft electrofisher and a single-person pontoon boat; 24 reaches occurred in the white zone and four in the green zone. We stratified sample reaches

based on riparian health scores (derived from a parallel study using aerial videography) and encompassed the full range of land use disturbance in the watershed. We standardized sample reaches to 700 and 1,300 m for upper- and lower-river reaches, respectively. We enumerated all captured fish by species and measured their length (mm) and weight (g) to enable biomass calculations. Habitat data included channel profile measurements, littoral plots measuring substrate and vegetative fish cover, and streambank assessments. We analysed the relationship between riparian health and fish biomass using Spearman correlation matrices.

Results

In 27 kilometers of sampling, we captured 314 sport fish of which 75% were mountain whitefish (*Prosopium williamsoni*) (n = 237), 10% rainbow trout (n = 30), 9% Arctic grayling (n = 27), 5% burbot (*Lota lota*) (n = 16) and 1% northern pike (*Esox lucius*) (n = 4). In terms of biomass, the catch was dominated by sucker species at 44% (29,597 g) and mountain whitefish 28% (18,837 g), followed by Arctic grayling and rainbow trout 9% (5,695 g) and 8% (5,216 g), respectively (Table 1). Overall sport fish species occurred more frequently and at higher diversity at reaches assigned a good riparian health score compared to those assigned fair to poor health scores (Figure 1). Biomass for sport fish, non-sport fish and all species combined, as well as total estimated fish cover, were greater at sites where we classified streambanks as >50% vegetated versus sites we classified as <50% vegetated (Figure 2). Mountain whitefish was the most widely distributed and frequently captured sport fish species in the study area. We captured rainbow trout and Arctic grayling less frequently, but they occurred throughout the study area from upper to lower reaches.

Table 1.   Length and biomass of fish captured from the Edson River during the summer of 2011 using electrofishing.

Species	Captures	Fork length (mm)			Total Biomass (g)
		Mean	SD	Range	
Sport fish					
Mountain whitefish	237	178	53	55 – 360	18,837
Arctic grayling	27	248	36	165 – 363	5,695
Rainbow trout	30	207	87	89 – 399	5,216
Burbot	16	302	68	195 – 412	2,593
Northern pike	4	308	34	275 – 355	891
Total	314				33,232
Non-sport fish					
White sucker	132	207	61	46 – 456	18,628
Longnose sucker	282	137	40	48 – 296	10,969
Lake chub	449	77	12	36 – 114	2,436
Trout-perch	205	62	12	32 – 89	764
Longnose dace	135	69	14	36 – 125	531
Spoonhead sculpin	16	108	17	58 – 109	90

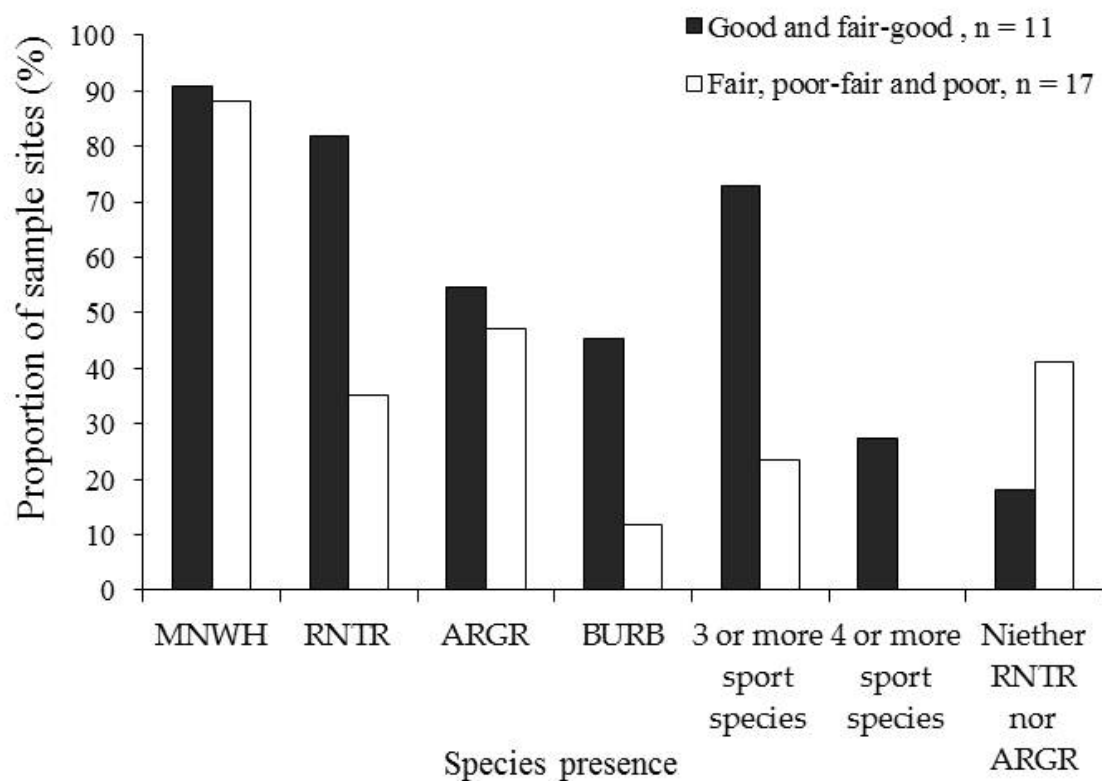|					
Brook stickleback	6	47	5	43 – 54	<10
Total	1,225				33,426

Figure 1.   General sport fish species presence and diversity by aerial riparian health category. Species abbreviations: MNWH = mountain whitefish, RNTR = rainbow trout, ARGR = Arctic grayling, BURB = burbot.
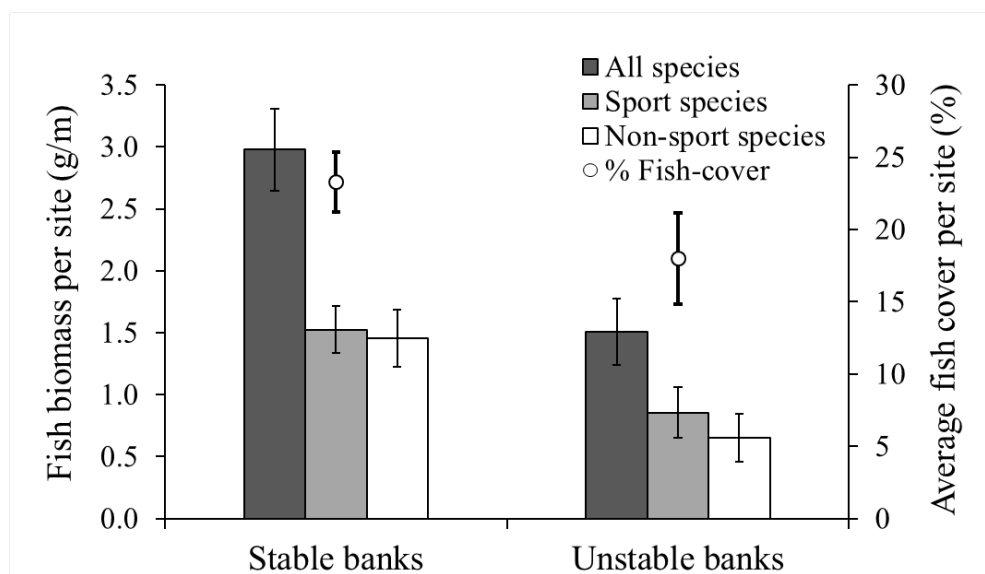
Figure 2.   Average fish biomass and littoral fish-cover, where median bank stability was classified as stable (>50% vegetated) or unstable banks (<50% vegetated). Error bars indicate one standard error around the mean.

Conclusions

We collected baseline data on fish and habitat that will provide a useful reference from which to assess responses to future riparian restoration activities and the health of the Edson River. Our results illustrate the benefits of healthy riparian areas to support sport fish in the river and serve as an aid in the prioritization and validation of riparian land acquisition and remediation projects.

Communications

- Produced ACA data report.

Literature Cited

Bryski, M.S. 1999. Arctic grayling historical review – grayling fisheries of the McLeod River Sub-basin in Fisheries Management Area 4. Trout Unlimited Canada. Report for Alberta Environmental Protection, Natural Resources Service, Fisheries Management Division. 43 pp + App.

Photos:

Alberta Conservation Association crew on cataraft electrofisher. Left to right: Patricia Halinowski, Brad Hurkett and Jason Blackburn. (Photo: Troy Furukawa)

Arctic grayling captured from the Edson River. (Photo: Jason Blackburn)

Alberta Conservation Association crew electrofishing at a shallow reach on the Edson River.
Left to right: Troy Furukawa, Jason Blackburn and Brendan Ganton. (Photo Patricia Halinowski)

Failing banks on the Edson River. Left to right: Jason Blackburn, Brendan Ganton and Troy Furukawa. (Photo: Patricia Halinowski)

Pontoon boat on riffle section of the Edson River. (Photo: Jason Blackburn)

Woody habitat on the Edson River. Left to right: Brad Hurkett and Troy Furukawa. (Photo: Patricia Halinowski)