

Alberta Conservation Association
2021/22 Project Summary Report

Project Name: Fish Stocking Evaluation

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Partnerships

Alberta Environment and Parks

Key Findings

- McQuillan Reservoir had a robust population of stocked rainbow trout, with evidence of multiple size/year classes, overwintering success, and some very large trout.
- Taber Trout Pond supports a significant population of yellow perch with evidence of multiples size/year classes and overwintering success. Heritage Lake and Beaumont Pond do not support significant yellow perch populations.
- Successful collection of numerous small-bodied fish and invertebrates indicates that McQuillan and Foremost reservoirs have a substantial forage base.

Abstract

Evaluation of our Fish Stocking Project suggests that poor water quality (high temperatures and low dissolved oxygen) at some of our ponds may limit their ability to support stocked trout throughout the summer months. In 2021/22, we evaluated if stocking created a fishery for anglers at Anderson Dam, Stirling Children’s Pond, and McQuillan and Foremost reservoirs; assessed the small-bodied fish and invertebrate forage base for trout at McQuillan and Foremost reservoirs (two waterbodies identified as potential locations for stocking alternate sport species); and described the size and abundance of yellow perch in Heritage Lake, Beaumont Pond, and

Taber Trout Pond (waterbodies with anecdotal reports of perch presence). We found that trout stocking at McQuillan Reservoir has created a robust population of rainbow trout with evidence of multiple size/years of survival and some very large trout are present. Taber Trout Pond supports a significant population of yellow perch with evidence of multiple size/year classes and overwintering success. McQuillan and Foremost reservoirs have a substantial forage base as assessed by minnow trapping and invertebrate collections.

Introduction

The primary goal of Alberta Conservation Association's (ACA) Fish Stocking Project is to provide increased angling opportunities to Albertans by stocking catchable-sized trout in small put-and-take fisheries across the province. However, our assessments suggest that some of our ponds may not support stocked trout throughout the summer months due to poor water quality (high temperatures and low dissolved oxygen), and that some ponds have very low angler use. This may be due to stocking not successfully establishing a population of fish for anglers to exploit. We will assess fish abundance shortly after stocking to determine if a population of fish was created for anglers at the following selected low angler use ponds: Anderson Dam, Stirling Children's Pond, and McQuillan and Foremost reservoirs. At McQuillan and Foremost reservoirs, we will assess the small-bodied fish and invertebrate forage base to determine their suitability for alternate species stocking. Recently, yellow perch have been reported in several trout-stocked ponds, including Heritage Lake and Don Sparrow Lake, and Taber Trout Pond. To verify these anecdotal reports, we assess abundance and population structure of yellow perch at these ponds.

Methods

We used fyke nets (trap: 200 cm x 120 cm, leads: 120 cm height x 7 m length, all 15 mm mesh) to capture fish and assess their abundance and size distribution at selected low angler use ponds (Anderson Dam, Stirling Children's Pond, and McQuillan and Foremost reservoirs) and to describe the size structure and relative abundance of yellow perch at Heritage Lake, Beaumont Pond, and Taber Trout Pond. At low angler use ponds, trail cameras were used to collect angler count data (vanPoorten et al. 2015) that we used to estimate angler effort. At McQuillan and Foremost reservoirs, we conducted minnow trapping, and zooplankton (tow samples) and

benthic invertebrate (grab samples) sampling to characterize the forage base. At all ponds, water quality sampling (routine parameters, nutrients, and regulated metals) and vertical (1 m increments) profiles of water temperature/dissolved oxygen were collected.

Results

We captured four trout at Stirling Children's Pond and 144 at McQuillan Reservoir, with multiple size/year classes observed at the later (Table 1). No trout were captured at Anderson Dam and Foremost Reservoir. At all low angler use ponds, non-sport fish species were also captured (Table 1). One yellow perch was captured at Beaumont Pond and 385 were captured at Taber Trout Pond, with evidence of multiple size/year classes observed at the later (Table 1). No yellow perch were captured at Heritage Lake. Dissolved oxygen (range 0.2 – 12.2), temperature (range 4.9 – 14.7) and other water quality parameters were within the acceptable range for trout survival at all ponds. At McQuillan and Foremost reservoirs, copepods were the most abundant zooplankton collected, and oligochaete worms and midges were the most common benthic invertebrates at Foremost and McQuillan reservoirs, respectively (Table 1). Estimates of angler effort at selected low angler use ponds ranged from 37 hours/ha at McQuillan Reservoir to 223 hours/ha at Foremost Reservoir (Table 2).

Table 1. Summary of data collected at selected fish stocking ponds (2021).

Waterbody	Activity Date	Fish Species Captured (Number and FL Range [mm]) ¹	DO Range (mg/L)	Temperature Range (°C)
Anderson Dam	2021/05/04	BRST (N=1, 65) FTMN (N=1, 71)	0.6-9.4	7.7-11.8
Beaumont Pond	2021/05/05	BNTR (N=16, 130-217) TGTR (N=4, 143-190) YLPR (N=1, 189)	0.2-12.2	4.9-10.7
Foremost Reservoir	2021/05/11	BRST (N=29, 20-62) FTMN (N=188, 30-65)	9.1-10.7	10.4-12.2
Heritage Lake	2021/05/11	BKTR (N=30, 145-227) BNTR (N=4, 119-177) NRPK (N=1, 540) RNTR (N=4, 158-188)	6.7-10	8.4-11.2
McQuillan Reservoir	2021/05/10	BRST (N=42, 44-69) FTMN (N=583, 44-75) LNSC (N=6, 438-480) RNTR (N=144, 132-590) WHSC (N=74, 255-545)	9.1-9.6	10.1-10.3
Stirling Children's Pond	2021/05/13	LKCH (N=2, 168-170) RNTR (N=4, 216-240)	10.7-11	10.9-12.6
Taber Trout Pond	2021-05/13	LNSC (N=2, 289-313) RNTR (N=2, 304-313) SPSH (N=1, 85) WHSC (N=1, 342) YLPR (N=385, 81-235)	9.7-12	10.6-14.7

¹BNTR= Brown trout, BRST= Brook stickleback, FTMN= Fathead minnow, LKCH= Lake chub, LNSC= Longnose sucker, NRPK= Northern pike, RNTR= Rainbow trout, SPSH= Spottail shiner, TGTR= Tiger trout, WHSC= White sucker, YLPR= Yellow perch

Table 2. Estimated angler effort at low effort study ponds.

Waterbody	Estimated Total Angler Effort		Estimated Fishing Pressure	
	Hours	95% CI	Hours/ha	95% CI
Foremost Reservoir	1,096	862 – 1,342	223	175 – 73
McQuillan Reservoir	343	250 – 443	37	27 – 47
Stirling Children's Pond	193	138 – 252	108	77 – 141

Conclusion

Trout were captured at two of the four low effort ponds with McQuillan Reservoir having a robust population of stocked trout with evidence of multiple size/year classes and overwintering success. Yellow perch evaluations indicates that Taber Trout Pond supports a significant population of yellow perch with evidence of multiple size/year classes and overwintering success. In contrast, Heritage Lake and Beaumont Pond do not support significant yellow perch populations. Successful collection of numerous small-bodied fish and invertebrates indicates that McQuillan and Foremost reservoirs have a substantial forage base for stocking alternate sport fish species.

Communications

Not applicable

Literature Cited

van Poorten, B.T., T.R. Carruthers, H.G. Ward, and D.A. Varkey. 2015. Imputing recreational angling effort from time-lapse cameras using an hierarchical Bayesian model. *Fisheries Research* 172: 265-273.

Photos



Photo 1. ACA staff preparing fyke net for setting at Taber Pond yellow perch evaluation.
Photo: Logan Redman

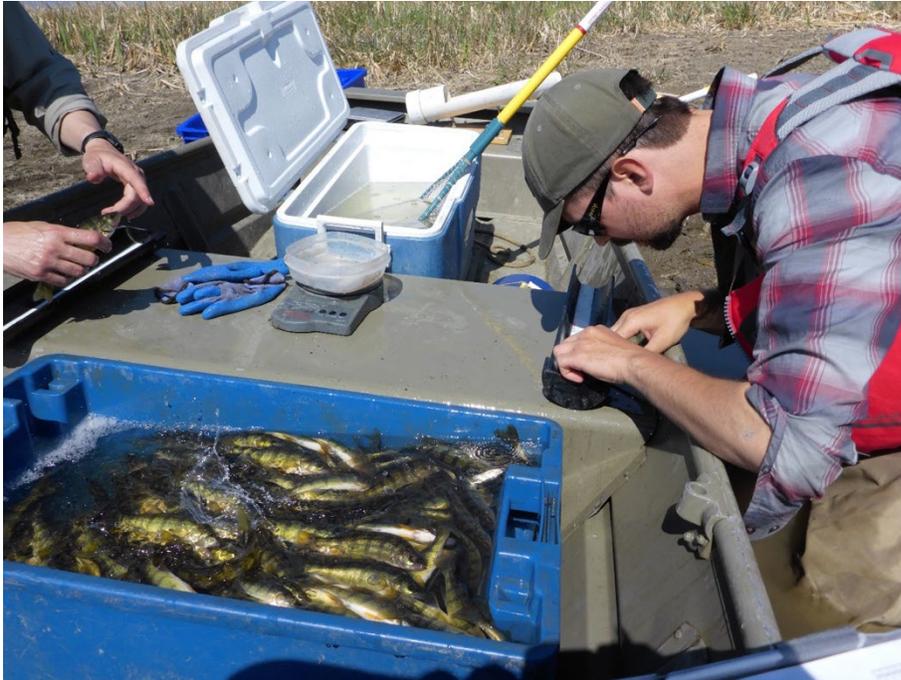


Photo 2. Yellow perch being measured at Taber Trout Pond. Photo: Logan Redman



Photo 3. Large (590 mm) rainbow trout captured at McQuillan Reservoir.
Photo: Kevin Fitzsimmons