Alberta Conservation Association
2016/17 Project Summary Report

Project Name: Enhanced Fish Stocking Water Quality

Fisheries Program Manager: Peter Aku

Project Leader: Britt Schmidt

Primary ACA staff on project:

Andrew Clough, Jessica Dubnyk, Troy Furukawa, Logan Redman, Britt Schmidt and Zachary Spence

Partnerships

Alberta Environment and Parks

Key Findings

- We collected bathymetry and water quality data at three new waterbodies and filled gaps in data for 32 existing Enhanced Fish Stocking waterbodies.
- Several Enhanced Fish Stocking waterbodies are shallow and prone to low dissolved oxygen levels and high temperatures, both of which can influence the survival of fish through the angling season.

Introduction

Alberta Conservation Association assumed responsibility for the Enhanced Fish Stocking (EFS) project in 1998. EFS annually stocks about 60 waterbodies with approximately 120,000 catchable-sized trout (i.e., 20 cm) into ponds to create put-and-take fisheries. The primary objective of EFS is to provide Albertans with increased recreational angling opportunities, particularly in areas of the province where such fishing opportunities do not otherwise exist. Most EFS ponds are close to municipalities, making them popular destinations. Anglers are allowed to harvest up to five fish per day, and social surveys suggest that most anglers are satisfied with these recreational angling opportunities (Patterson 2011).

Despite the success of the project in attracting and satisfying anglers (Patterson 2011), and despite the significant annual cost of running the project, very little information exists on the suitability of these stocked waterbodies to support put-and-take sport fisheries throughout the summer season. Consequently, from 2011 to 2013, we surveyed all EFS ponds to establish a comprehensive water quality and bathymetric database to support evaluation of the suitability of these ponds for stocking. In the current study, we collected bathymetry and water quality data on three new ponds, and filled in data gaps from 35 existing ponds.

Methods

We collected bathymetry and water quality data at 35 waterbodies in either spring (May 17 – June 28) or summer (July 2 – September 2), or during both seasons. We collected bathymetry data using a boat-mounted Garmin Chartplotter that recorded coordinates and depths as we drove back and forth across the waterbody; the shoreline was mapped with a handheld Global Positioning System (GPS) unit. We then combined depth and perimeter data to derive a bathymetric map of the waterbody.

To assess water quality, we measured temperature, conductivity, pH, and dissolved oxygen (DO) profiles using a multi-parameter YSI meter (YSI Professional Plus) and Secchi depth at three sampling locations at each pond. The sampling locations were chosen to be representative of maximum depth and any other significant morphometric features (e.g., subbasin; far end of an elongate lake). Temperature, DO, conductivity and pH were averaged across the three sampling locations at every depth. Similarly, composite water samples, taken from three sampling locations and mixed, were analyzed by Maxxam Analytics for chlorophyll-*a*, ammonia, total phosphorous, total nitrogen, nitrite/nitrate, turbidity and conductivity.

Results

EFS waterbodies span a range of physical and water quality characteristics but are typically small in size (range: 0.2 – 16.9 ha; average: 2.8 ha), shallow (range: 2.0 – 35.4 m; average: 6.3 m) and prone to high temperatures (range: 4.2 – 25.5ºC; average: 18.5ºC) and low DO (range: 0 – 14.5 mg/L; average 5.8 mg/L) during the summer. Similarly, nutrient concentrations are high (range of total phosphorus: 0.007 – 0.9 mg/L; average 0.1 mg/L), with abundant algal growth (range of chlorophyll-*a*: 1.0 – 64.0 µg/L; average: 12.0 µg/L).

Conclusions

Collecting water quality and bathymetric data in 2016 allowed us to complete a comprehensive database for all of our EFS ponds. Several EFS waterbodies are shallow and prone to low dissolved oxygen levels and high temperatures, both of which can influence the survival of fish through the angling season. These data will be used to inform future EFS projects and management.

Communications

A report including bathymetric maps and summarized water quality data for all EFS ponds will be made available on our website.

Literature Cited

Patterson, W.F. 2011. Do hatchery trucks make happy anglers? Evaluating entrenched assumptions of put-and-take fisheries. MSc Thesis, Royal Roads University, Victoria, British Columbia, Canada.

Photos

Jessica Dubnyk (Alberta Conservation Association) launching the boat for water quality testing at Heritage Lake. Photo: Britt Schmidt

Alberta Conservation Association staff collect water quality data at an Enhanced Fish Stocking waterbody. Photo: Britt Schmidt