

**Alberta Conservation Association
2021/22 Project Summary Report**

Project Name: New Lake Aeration Development

Fisheries Program Manager: Peter Aku

Project Leader: Brad Hurkett

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Partnerships

Alberta Environment and Parks

County of Barrhead

Key Findings

- We monitored winter dissolved oxygen and temperature at Little Bear and Sauer lakes to determine their potential for future aeration.
- We received support from the County of Barrhead to develop an aeration system at Peanut Lake.
- We provided technical support to the County of Two Hills for their aeration project at Jackfish Lake.

Abstract

ACA's Lake Aeration Project promotes angling opportunities in stocked waterbodies across Alberta where such fishing opportunities are otherwise limited. Waterbodies aerated in the project are prone to fish kills during winter and summer months due to low dissolved oxygen (DO), but with aeration, DO levels are maintained to promote year-round survival of stocked trout. Each year, we receive several requests from stakeholder groups to aerate waterbodies throughout the province. Given the substantial cost associated with aeration operations, we carefully screen candidate waterbodies to ensure that we address top AEP provincial-level priorities. In 2021/22, we screened two lakes, Little Bear and Sauer lakes by monitoring DO and temperature profiles during winter months. This is the third year collecting DO and temperature

data at Sauer Lake, and we continue to monitor and investigate developing an aeration system at Little Bear Lake. In 2021/22, we added Peanut Lake to the lake aeration project and developed the site in the fall with support from the County of Barrhead. We provided technical support to the County of Two Hills to develop and operate their new winter aeration system at Jackfish Lake.

Introduction

Alberta Conservation Association's (ACA) Lake Aeration Project provides Albertans with recreational angling opportunities in lakes across the province where such fishing opportunities are otherwise limited. The lakes we aerate are prone to both summer and winter fish kills due to low dissolved oxygen (DO), but through aeration, we maintain DO at levels that promote year-round survival of stocked trout. Each year, ACA receives several requests for aeration at new waterbodies across the province. Given the substantial cost associated with aeration, we carefully screen requests to ensure that we address top Alberta Environment and Parks (AEP) provincial-level priorities. After a preliminary review of the requests we received, we developed a short list of lakes for further screening as potential candidates for future aeration.

Methods

We identify candidate waterbodies for aeration through ongoing consultation with AEP, local anglers, and other stakeholders. In 2021/22, we screened two waterbodies including, Little Bear and Sauer lakes by measuring monthly winter DO and temperature profiles from each lake in partnership with AEP; local AEP staff collected the monthly data on Little Bear Lake. Key screening criteria include alignment with AEP/ACA provincial-level priorities; multi-year patterns in frequency and severity of fish kills; water quality data (particularly nutrients and DO profiles); lake depth and size; and proximity to electrical power, roads, and major population centre (Table 1).

Table 1. Evaluation criteria used to screen candidate waterbodies for winter surface aeration.

Criteria	Description
Waterbody identification	
	Alignment with AEP/ACA (Joint Program Committee - JPC) provincial-level priorities.
	Request for investigation by AEP.
	Request for investigation by other stakeholders (e.g., Alberta Fish & Game Association [AFGA]).
	Typically, a stocked fishery, existing or in development.
	Does project add to diversity of angling experience/opportunity in area?
Waterbody assessment	
Historical fish kill pattern	What is the history of winter fish kills in the lake? Historical patterns in frequency and severity of fish kills. Partial or complete kill?
Water quality data	Availability of water quality data, particularly dissolved oxygen (DO) and nutrients. Depending on available data or where sufficient data does not exist, water quality will be monitored monthly during winter for one to three years. Highly eutrophic waterbodies with high nutrient loads and low DO are less desirable candidates for aeration.
Mean depth	Most Alberta shallow lakes tend to be more eutrophic and productive than deeper lakes and therefore require greater aeration input. Generally, <2.5 m not desired, 2.5 – 3.5 m acceptable, and >3.5 m ideal.
Waterbody size	Relates directly to the number of aerators required and associated cost and maintenance needs. Larger lakes provide a greater angling opportunity but require more aerators, higher operating and development costs, and maintenance needs. Conversely, smaller lakes typically provide less of an angling opportunity, but have lower operating and development costs, and maintenance needs: < 2.5 ha not desired, 10 – 60 ha acceptable/ideal, and >100 ha considered.
Logistics and operational cost	Proximity to electrical power, road access, and proximity to major population centres; other existing facilities.
Partner support	Project support (i.e., monetary or in-kind) from corporate, organizational, and stakeholder project partners to reduce development and/or operational costs and maintenance needs.

Results

In 2021/22, ACA and local AEP staff collected winter DO and water temperature data at two waterbodies across the province. This is the third season collecting DO and temperature data at Sauer Lake, and we continue to monitor and investigate developing an aeration system at Little Bear Lake. In September, we met with the Municipal District (MD) of Bonnyville council and proposed establishment of partnership with the MD to develop an aeration system at Little Bear Lake. Since the 2021 fall election, the council changed, and we are currently waiting for a response about the partnership from the MD. In 2021/22, we added Peanut Lake to the Lake Aeration Project and established a partnership with the County of Barrhead to support the project. This year we provided technical support to the County of Two Hills to help develop and operate their new winter aeration system at Jackfish Lake.

Conclusions

With support from the County of Barrhead and providing support to the County of Two Hills, we successfully developed aeration at Peanut and Jackfish lakes to overwinter fish. We continue to identify and screen potential candidate waterbodies at Little Bear Lake and other lakes for aeration development to expand ACA's Lake Aeration Project with the purpose of increasing year-round angling opportunities to our stakeholders.

Communications

- Water quality data results were shared with AEP.
- Met with the MD of Bonnyville council to develop partnership in support of aerating Little Bear Lake.
- Met with the County of Barrhead council to develop partnership in support of aerating Peanut Lake.

Literature Cited

Not applicable

Photos



Photo 1. Little Bear Lake on a warm, calm June day. Photo: Brad Hurkett



Photo 2. Newly installed power line at Peanut Lake. Photo: Troy Furukawa



Photo 3. Safety fence installed around the polynya (open water) at Jackfish Lake – County of Two Hills project. Photo: Troy Furukawa