

**Alberta Conservation Association**  
**2020/21 Project Summary Report**

**Project Name:** New Lake Aeration Development

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**Partnerships**

Alberta Environment and Parks

**Key Findings**

- Monitored winter dissolved oxygen and temperature at Little Bear Lake, Peanut Lake, Sauer Lake, and Bullshead Reservoir as part of a screening process of potential candidate lakes for future aeration.
- Based on our screening results from previous years, we added Kerbes Pond to our aeration project and will use an extended open-water period (May – early December) diffuser aeration instead of winter aeration. Running diffusers into December should provide the pond with enough oxygen to overwinter trout with minimal risk of winterkill most years.

**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 program 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. Given the substantial cost associated with such operations, it is important that we carefully

screen candidate waterbodies to ensure that we address top AEP provincial-level priorities. Each year we receive many requests from stakeholder groups to aerate waterbodies throughout the province. After a preliminary review of the requests, we develop a short list of lakes for further screening as potential candidates for future aeration. Currently ACA is screening four candidate waterbodies by monitoring DO and temperature profiles during winter months. In 2020/21, and with the assistance of AEP, we monitored Little Bear, Peanut, and Sauer lakes, and Bullshead Reservoir. This is the second year collecting DO and temperature at Peanut and Sauer lakes and the third and final year at Little Bear Lake and Bullshead Reservoir. In 2020/21, we added Kerbes Pond to our aeration project and will use an extended open-water period (May – mid December) diffuser aeration instead of winter aeration. Our screening results indicate that running the diffusers into early December should provide the pond with enough oxygen to overwinter trout with minimal risk of winterkill. We will continue to monitor winter DO profiles at Kerbes Pond and re-evaluate our approach after three years. Based on our screening results, additional candidate waterbodies may be selected for development to expand ACA's aeration project.

## **Introduction**

Alberta Conservation Association's (ACA's) Lake Aeration program provides Albertans with recreational angling opportunities in lakes and ponds 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 new lake aeration across the province. Given the substantial cost associated with aeration, it is essential that 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 2020/21, we screened four waterbodies including, Little Bear, Peanut, Sauer lakes, and Bullshead Reservoir by measuring monthly winter DO and temperature

profiles from each lake in partnership with AEP; local AEP staff collected the monthly data on Bullshead, Peanut, and Little Bear lakes. 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 center (Table 1).

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

Criteria	Description
<b>Waterbody identification</b>	
	Alignment with AEP/ACA (JPC) provincial-level priorities.
	Request for investigation by AEP.
	Request for investigation by other stakeholders (e.g., AFGA).
	Typically, a stocked fishery, existing or in development.
	Does project add to diversity of angling experience/opportunity in area?
<b>Waterbody assessment</b>	
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, less than 2.5 m not desired, 2.5–3.5 m acceptable, >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, >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 2020/21, ACA and local AEP staff collected winter DO and water temperature data at four waterbodies across the province. This is the second season collecting DO and temperature data at Peanut and Sauer lakes and the third and final year at Little Bear Lake and Bullshead Reservoir. This year we added Kerbes Pond to our aeration project and continue to destratify it using air diffusers in the open water season (May – mid-December). We will continue monitoring winter water quality at Kerbes Pond for three more years (2021 – 2023) and reevaluate the efficacy of the diffuser system to ensure we promote year-round survival of stocked trout.

## **Conclusions**

We continue to identify and screen potential candidate waterbodies for aeration development to expand ACA's Lake Aeration project. We added Kerbes Pond to our aeration project and will use an extended open-water period (May – early December) diffuser aeration instead of winter aeration. Our screening results indicate that running the diffusers into early December should provide the Kerbes Pond with enough oxygen to overwinter trout with minimal risk of winterkill.

## **Communications**

- Water quality data results have been shared with AEP.

## Literature Cited

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## Photos



ACA staff preparing to monitor dissolved oxygen and water temperature at Bullshead Reservoir.

Photo: Logan Redman



Shoreside view of Peanut Lake in summer. Photo: Peter Aku