

**Alberta Conservation Association  
2018/19 Project Summary Report**

**Project Name:** New Lake Aeration Development

**Fisheries Program Manager:** Peter Aku

**Project Leader:** Brendan Ganton

**Primary ACA staff on project:** Brendan Ganton and David Jackson

**Partnerships**

Alberta Environment and Parks  
Municipal District of Greenview

**Key Findings**

- In partnership with Municipal District of Greenview, we expanded ACA aeration program to include West Dollar Lake as part of the combined Dollar Lakes site.
- Operated surface aerators at West Dollar Lake, stocked for the first time in fall 2018/19; aerators maintained adequate dissolved oxygen levels to overwinter trout.
- Generated data for screening of candidate waterbodies by collecting winter oxygen and temperature data at Little Bear Lake and Kerbes Pond.

**Introduction**

Through its Lake Aeration Project, ACA provides Albertans with recreational angling opportunities in areas of the province where such fishing opportunities are otherwise limited. Aerated waterbodies are typically shallow and eutrophic, experience prolonged ice cover, and are prone to both summer and winter fish kills (Miller and Mackay 1996). In winter, low dissolved

oxygen resulting from the interplay low photosynthetic oxygen production, and high biological oxygen demand leads to fish death (Ashley and Nordin 1999). Whereas summerkill is the result of the interaction between high surface temperatures and low hypolimnetic DO levels (Aku et al. 1997). Without intervention, the ability of these lakes to support fisheries would be limited. However, aeration promotes year-round survival and (sometimes considerable) growth of trout in these lakes. In 2018/19 ACA aerated 19 waterbodies across the province.

With ongoing angler interest in diverse angling opportunities and improving water quality, we continue working to identify and screen potential sites for developing new aeration infrastructure. Each year, ACA receives several requests for new lake aeration across the province, however 2018/19 was exceptional as we received many more requests than in past years. We suspect this increase in requests may be attributed to the late winter weather, followed closely by a hot spring and summer that resulted in fish kills on several lakes in 2018.

## **Methods**

We identify candidate waterbodies for aeration through ongoing consultation with AEP, local anglers, and other stakeholders and considering provincial level priorities and needs for AEP and ACA. Due to differences between lakes (i.e., size, depth, temperature, oxygen demand) the success of winter aeration can vary greatly. With finite resources, it is critical to employ methods shown to be successful and optimize approaches for each lake (Ashley et al. 1992, Miller and Mackay 2003). As such, we screen candidate waterbodies based on a suite of characteristics including, but not limited to:

- Historical frequency and severity of fish kills; waterbodies must require aeration to maintain stocked population (i.e., history of winterkill).
- Water quality data; including dissolved oxygen (DO) and nutrients. Where sufficient data does not exist, this may require one to three year water quality monitoring (particularly, monthly winter oxygen). Generally, highly eutrophic waterbodies with high nutrient loading and very low winter oxygen levels are less desirable.

- Mean depth; most shallow Alberta 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.
- Surface Area; this relates directly to the number of aerators required and associated cost and maintenance needs. Although initially less expensive, small waterbodies may not provide adequate angling opportunity to offset the cost of development. In contrast, larger water bodies will generally provide more angling opportunities; however, waterbodies that are too large may be too costly to develop and maintain aeration. Generally, less than 2.5 ha is not desired, 10 – 60 ha acceptable/ideal, >100 ha will result in higher costs but may be considered.
- Logistics: proximity to electrical power, road access and major population centre; other existing facilities.
- Potential for partner support and funding.

Based on screening results, candidate lakes may be selected for development of aeration facilities and be incorporated into the ACA Lake Aeration project.

## **Results**

In the 2018/19 season, with the support of the Municipal District of Greenview, we updated electrical facilities at East and West Dollar lakes to allow for aeration of both lakes from one central location. This fulfilled a long-time desire from both anglers and ACA as we aerated West Dollar Lake for the first time, now combined with East Dollar Lake as “Dollar Lakes” aeration site. Power facility installation at Dollar Lakes was completed in mid-October 2018 and aeration was immediately commenced. and providing an additional 7 ha of aerated waters for anglers. Performance of the new aeration system was monitored, and oxygen levels remained adequate throughout the winter season.

Also, in 2018, we measured monthly DO and temp profiles at Kerbes Pond and, with the help of staff from the Cold Lake fish hatchery, Little Bear Lake as part of the screening process.

## **Communications**

N/A

## **Conclusions**

With the expansion of aeration activities at Dollar Lakes in 2018/19 season, this site now includes 13 ha of aerated waters. Surface aeration has been successful at maintaining dissolved oxygen at a level suitable for trout survival at Dollar Lakes. We continue to identify and screen potential candidate waterbodies for development and addition to ACA's Lake aeration Program.

## **Literature Cited**

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## Photos



Fountain action of surface aerators shortly after being powered on for the first time at West Dollar Lake. Photo: Scott Seward



Safety fence and warning signage surrounding surface aerators in late-January 2018 at West Dollar Lake. Photo: Dave Jackson