

Alberta Conservation Association 2016/17 Project Summary Report

Project Name: Central Region Aeration Development

Fisheries Program Manager: Peter Aku

Project Leader: Chad Judd

Primary ACA staff on project: Andrew Clough, Chad Judd and Kevin Fitzsimmons

Partnerships

Alberta Environment and Parks
Mountain View County

Key Findings

- Continued dissolved oxygen monitoring at Hansen's Reservoir and Winchell Lake.
- Operated surface aerators powered by a temporary propane generator at Hansen's Reservoir for the first time in winter 2016/17; aerators maintained adequate dissolved oxygen levels to overwinter trout.
- Continued discussions with Mountain View County and Fortis Alberta regarding access to county property and power installation costs at Winchell Lake and Hansen's Reservoir.

Introduction

Alberta Conservation Association (ACA) uses aeration as a management technique to provide Albertans with recreational angling 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. Low winter hypolimnetic dissolved oxygen resulting from the interplay of shallow depths, low photosynthetic oxygen production and high biological oxygen demand lead to winterkills (Miller and Mackay 1996). Currently, we aerate 18 waterbodies across the province. With increased demand for recreational angling opportunities and a levy increase in 2014, additional funds were allocated to the Fisheries Program to expand our aeration project. We identified Winchell Lake and Hansen's Reservoir in the Rocky Mountain House region as potential sites for developing new aeration infrastructure. Hansen's Reservoir currently has two windmill aerators, but they have been ineffective at maintaining adequate dissolved oxygen levels throughout the winter.

Methods

We held discussions with Mountain View County and Fortis Alberta regarding access to county property and power installation costs to Winchell Lake and Hansen's Reservoir and continued to measure dissolved oxygen and temperature profiles at both sites throughout the winter months.

Results

Initial quotes from Fortis Alberta for Hansen’s Reservoir estimated the cost of power installation to be \$12,403.38 based on 194 m of aboveground primary service. After site visits and surveying, it was deemed not possible to have aboveground service at the original locations. Subsequent quotes and routes were gathered, and it was determined that the best route would be underground primary service. The quote for underground service at Hansen’s Reservoir is \$18,499.79. In December 2016, we switched from windmill to mechanical surface aerators at Hansen’s Reservoir that were powered temporarily by a portable propane generator pending installation of power lines in 2017. As a result, dissolved oxygen levels remained well above 3 mg/L (Table 1), with much higher monthly averages than in previous winters.

Table 1. Comparison of average winter monthly dissolved oxygen concentrations at all sites and depths at Hansen’s Reservoir during windmill (2010/11 – 2015/16) and surface aerator (2016/17) operations.

Winter	Dissolved oxygen (mg/L)			
	Dec	Jan	Feb	Mar
2010/11	–	–	–	0.13
2011/12	3.78	0.18	0.71	0.37
2012/13	1.43	1.00	0.59	–
2012/14	6.69	0.97	0.99	0.33
2014/15	3.24	0.27	0.22	–
2015/16	2.69	0.53	1.07	–
2016/17	5.27	6.26	7.49	–

We held meetings with Mountain View County (a potential partner on this project) regarding aeration at Winchell Lake and the placement of power lines on the county’s right-of-way. Subsequently, a formal submission was made to Mountain View County for approval of aeration infrastructure on county lands. The initial quote for primary aboveground service at Winchell Lake was \$11,325.52. This quote is being updated to include aboveground and underground service as requested by Mountain View County.

Conclusions

Surface aeration using temporary power at Hansen’s Reservoir has been successful at maintaining oxygen levels at a level suitable for trout survival. We continue to communicate with Mountain View County and Fortis Alberta regarding access to county property and power installation costs to Winchell Lake and Hansen’s Reservoir.

Communications

We gave a presentation to Mountain View County elected council and senior staff on ACA’s aeration program and proposed aeration at Winchell Lake.

Literature Cited

Miller, T.G., and W.C. Mackay. 1996. A comparison of mechanical surface aeration and point release air injection used to prevent winterkill in Alberta. Second annual progress report on winter lake aeration. Department of Biological Sciences, University of Alberta, Edmonton, Alberta, Canada. 64 pp.

Photos



Operation of surface aerators at Hansen's Reservoir. Photo: Chad Judd



Kevin Fitzsimmons (Alberta Conservation Association) measuring oxygen levels at Winchell Lake. Photo: Marco Fontana