Alberta Conservation Association

2023/24 Project Summary Report

Project Name: Fish Pond Rehabilitation

Fisheries Program Manager: Peter Aku

Project Leader: Scott Seward

Primary ACA Staff on Project: David Jackson, Kevin Fitzsimmons, Troy Furukawa, Lindsay Marley, Ariel Schlereth, and Scott Seward

Partnerships

Government of Alberta
Northern Lights Fly Fishers
Saddle Hills County
Westlock County

Key Findings

- Long-term diffuser aeration of Shell True North Pond during spring–fall open water periods is improving year-round dissolved oxygen concentration and extending fishing opportunity into winter months.
- Alum treatment of Westlock Pond significantly reduced mean total phosphorus and dissolved phosphorus concentrations (67% reduction), while phosphorus concentrations in control ponds remained unchanged.
- More time is required to determine if alum treatment has made Westlock Pond a stable environment with reduced algal growth and minimized dissolved oxygen fluctuations that is less prone to fish kill.

Details

Fishing effort at Alberta Conservation Association (ACA) stocked ponds can exceed 2,000 h/ha in the summer months, indicating these ponds can be popular among anglers. However, some of these ponds may not be capable of supporting trout survival beyond mid-summer due to low

dissolved oxygen (DO) and high temperature. Therefore, we are investigating two techniques to improve water quality and DO concentrations in these ponds to increase angler opportunity: diffuse aeration during the open water season (spring–fall) and alum treatment. We have aerated Shell True North Pond during the open water season for the past six years and continue to improve DO concentration deeper into the water column and during winter months. In 2023, we tested the effectiveness of aluminum sulphate (alum) treatment to reduce phosphorus, control algal blooms, and improve overwintering DO concentrations in stocked ponds using a before-after, control-impact study design. In 2020 and 2021, we collected baseline water quality data that became the before data in our experimental design and demonstrated the need for alum treatment in Westlock Pond. We applied 9,430 L of alum to Westlock Pond in the spring of 2023. Alum treatment occurred over two events, May 30–31 and June 20, to a final dose of 250 mg of alum per litre of lake water. At this dose we were able to significantly reduce total and dissolved phosphorus (67% reduction), while control ponds remained unchanged. Throughout the alum treatment, we also maintained favourable pH and alkalinity for fish and invertebrate survival (i.e., pH > 7.0, alkalinity > 90 mg/L). More time is required to determine if alum treatment has made Westlock Pond a stable environment with reduced algal growth and minimized DO fluctuations that is less prone to fish kill.

Photos

Photo 1. Diffuser aeration at Shell True North Pond. Photo: Garret Mcken

Photo 2. Aluminum sulphate being applied to Westlock Pond using a pump, discharge hose, and boat. Photo: Kevin Fitzsimmons

Photo 3. Aerial photo of aluminum sulphate being applied to Westlock Pond using a pump, discharge hose, and boat. Photo: Northern Lights Fly Fishers