

Background

- Many waterfowl species require higher water quality habitats
- Some species reroute migrations if quality is too low to lakes/pond of higher quality
- Indicators of good water quality
 - Size of body of water compared to organism abundance
 - Clarity of water
 - Abundance of macrophytes
 - Food availability
 - Adequate nutrient levels (Nitrates, phosphates, pH, O2 levels, etc.)



Canada Goose

- Abundant residents of urban and rural ponds and lakes
- Historically a migratory species, now often seen as permanent residents
- Habitat generalists
- Potential correlation to low water quality and less diversity in locations with large populations of geese
- Potential eutrophication via fecal bioload
- Known carriers of *E. coli* in feces
- Potential correlation between coliform counts found in water and amount of goose feces present

Introduction

This project seeks to observe the relationship between water quality and the biodiversity of waterfowl with a special focus on the population and presence of *B. canadensis* in and around aquatic ecosystems. Waterfowl diversity and water quality metrics (e.g. secchi discs, pH, temperature & dissolved oxygen) will be documented at each site. **We expect to see correlation between water quality, bird diversity and raised coliform levels in water samples.** Understanding how waterfowl are associated with and impact water quality is important to aid in maintaining the health of aquatic ecosystems and organisms within those environments.

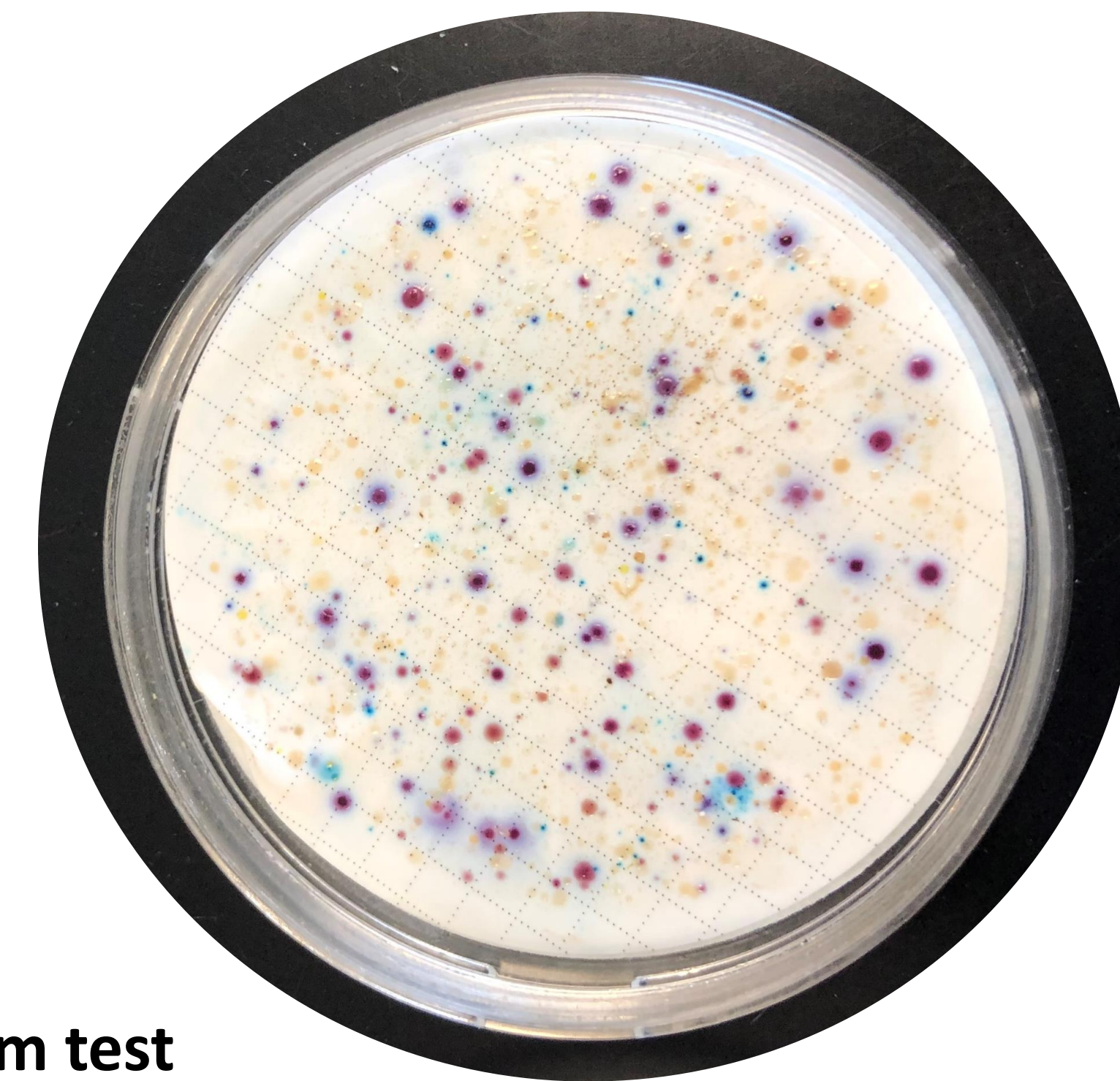
Methods and Preliminary Sampling

Survey locations- Waterfowl diversity surveys using visual populations counts will be conducted comparing rural and urban sites like Thrashers Lake, Stonehouse Lake, and Otter Lake. Surveys will be conducted 4 times at each location throughout the months of March and April with historical data collected for the month of February.

Water quality testing- Sampling will be conducted using pH, nitrates, alkalinity, phosphates, temperature, and oxygen tests. Secchi discs will be used to measure the clarity of the water and trophic status. Tests will be conducted in the field at 3-4 different locations on each of the survey days over the month of March 2022. Additionally, plant and algae growth will be quantified by breaking the ponds into quadrants and determining percentages of each quadrant covered with plant and algae growth.

Bacteria testing- Coliform tests will be conducted to determine and quantify the presence of *E. coli* as a measure of eutrophication

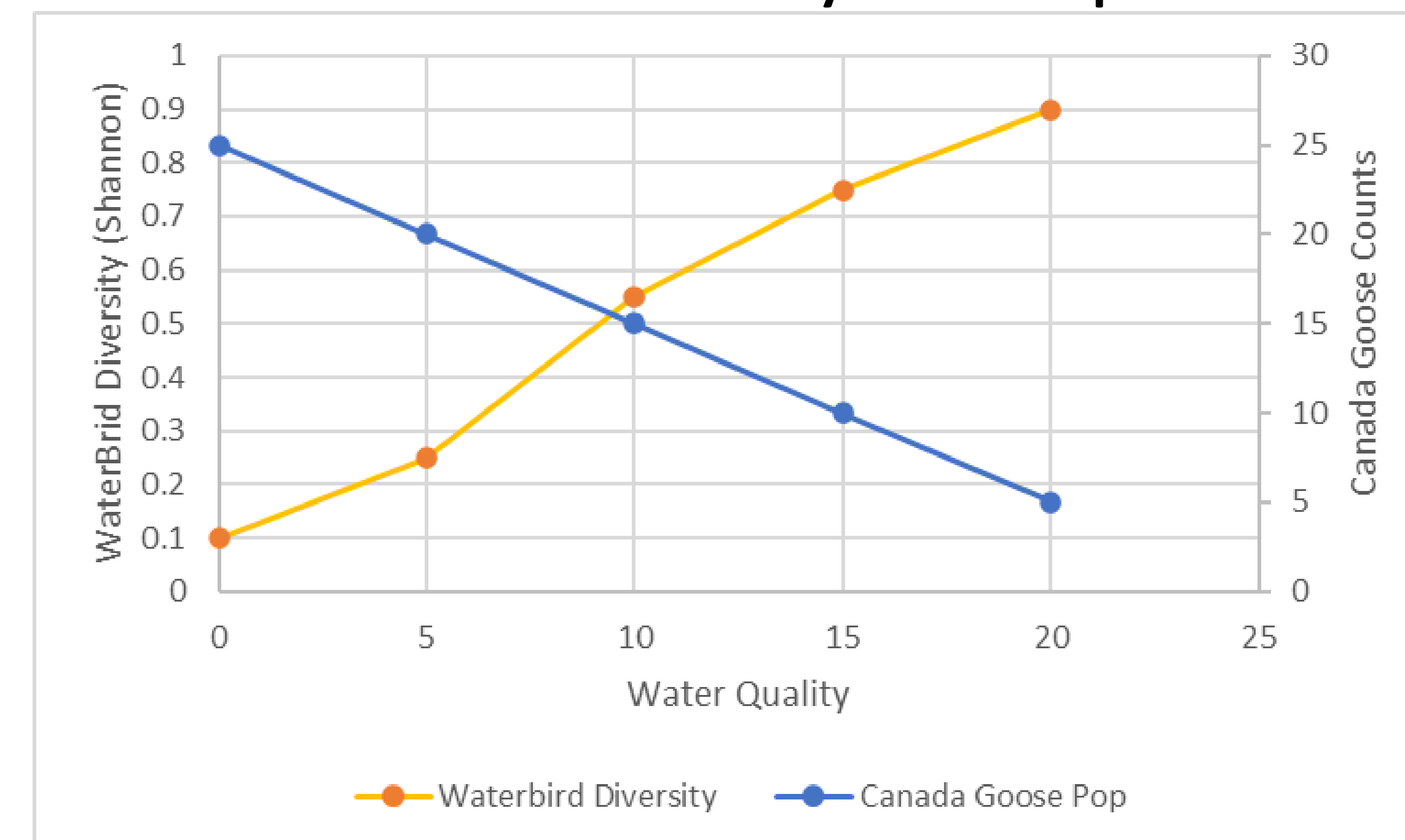
Sampling Locations



Coliform test



Shannon's Diversity Index Graph



Expected Results

Due to waters' considerable influence on biotic organisms, we expect locations with high waterbird diversities to correlate with high quality of water. Lower quality of water is expected to correlate with lower diversity of waterbird in relation to high populations of Canada Geese due to nutrient loading. We expect to see increased eutrophication and higher coliform counts (*E. coli*) with heightened abundance of Canada geese.



Future Work

- Prevent spread of zoonoses like *Giardia* and *Cryptosporidium* in recreational waters
- Manage Canada goose populations
- Find ways to encourage bird species richness and diversity
- Preservation of water quality

References

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