

The Ganaraska River as a Source of Motive and Electric Power: Past, Present, and Future

Purpose

- To explore the possibility of the Ganaraska river as a source of hydroelectric and motive power based on its history and its future prospects in Port Hope, Ontario



Background

- The Ganaraska river has been used to power waterwheels at mills and distilleries throughout history, even before Port Hope's founding in 1819
- In 1885, the Port Hope Electric Light and Power company used the river for hydro electricity generation
- The river has a history of flooding that has washed out many dams over time and the last major flood occurred in 1980
- The fish ladder at Corbett's dam in Port Hope allows for the migration of salmon upstream (image above)

Methods

- We conducted a literature review of the history of the Ganaraska river, small hydroelectric technologies, and the effects of climate change on rivers
- In Port Hope, we visited the river, the Port Hope archives and library to identify resources

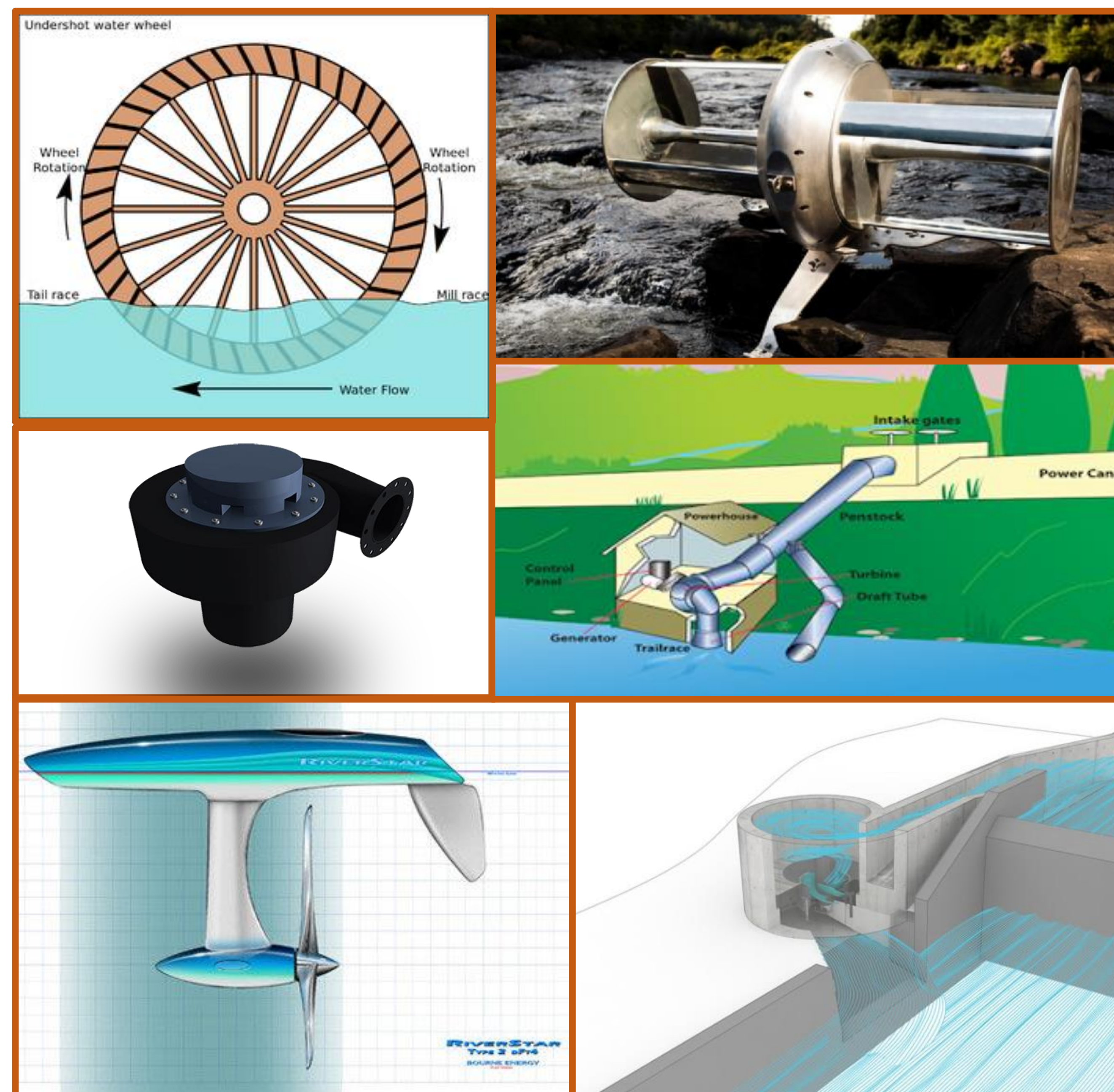


Figure Description: Top left water wheel, top right Idenergy turbine, middle left Blue Freedom vortex, middle right run of river, bottom left Riverstar module, bottom right Turbulent Whirlpool turbine

Preliminary Outcomes

Six Possible Small Hydroelectric Technologies

1. Re-establishing a Water Wheel
 2. Run – of – River small hydropower
 3. Blue Freedom Vortex
 4. Idenergy River Turbine
 5. RiverStar Self Contained Energy Module
 6. Whirlpool Turbine by Turbulent
- Of these technologies, the best options for Port Hope are the Idenergy Turbine or the Whirlpool Turbine because of their minimal infrastructure, simple environmental requirements, and high energy outputs

Impacts of Climate Change

- Increased risk of erratic weathering including heavy rainfall events and freeze-thaw cycles
- Increased risk of flooding, drought, and bank erosion
- Increased stress on infrastructure

Recommendations

- The Ganaraska river has many uses and is an important part of Port Hope
- We recommend that Whirlpool Turbulent and Idenergy turbines be looked into further
- Impacts of climate change on the technologies and fish ladder should be considered in future projects

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