

Using Life History Traits of Coregonid Species To Make Inferences about Atlantic Whitefish (*Coregonus huntsmani*) Anadromy, Migratory Struggles and Spawning Behaviour

Introduction

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Discussion

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Figure 1. The Atlantic Whitefish (Scott and Scott 1988)

Distribution

Significance

- Endemic to Nova Scotia, Canada¹
- Restricted to 3 lakes in the Petite Rivière watershed¹
- Previously lived in the Tusket-Annis Watershed²

- Genetically distinct from other all Coregonids^{7,8}
- A basal lineage of the genus²

Anadromy

- Previous population was anadromous⁹
- Restricted to a freshwater habitat due to the construction of dams, which has contributed to the decline of the species^{4,5}

Life History Traits

- Most are completely unknown²
- Provides major knowledge gaps in our conservation efforts

Threats

- Construction and operation of dams²
- Invasive species³
- Poor land-use and water-use practices^{4,5}
- Unregulated fishing practices⁶
- Predation²
- Competition²

Research Question

Can we use genetic proximity of Coregonid species to determine the unknown life history traits of the Atlantic Whitefish?

Methods

- A literature review on 24 closely-related species, based on the published phylogeny of Coregonids (Figure 2)

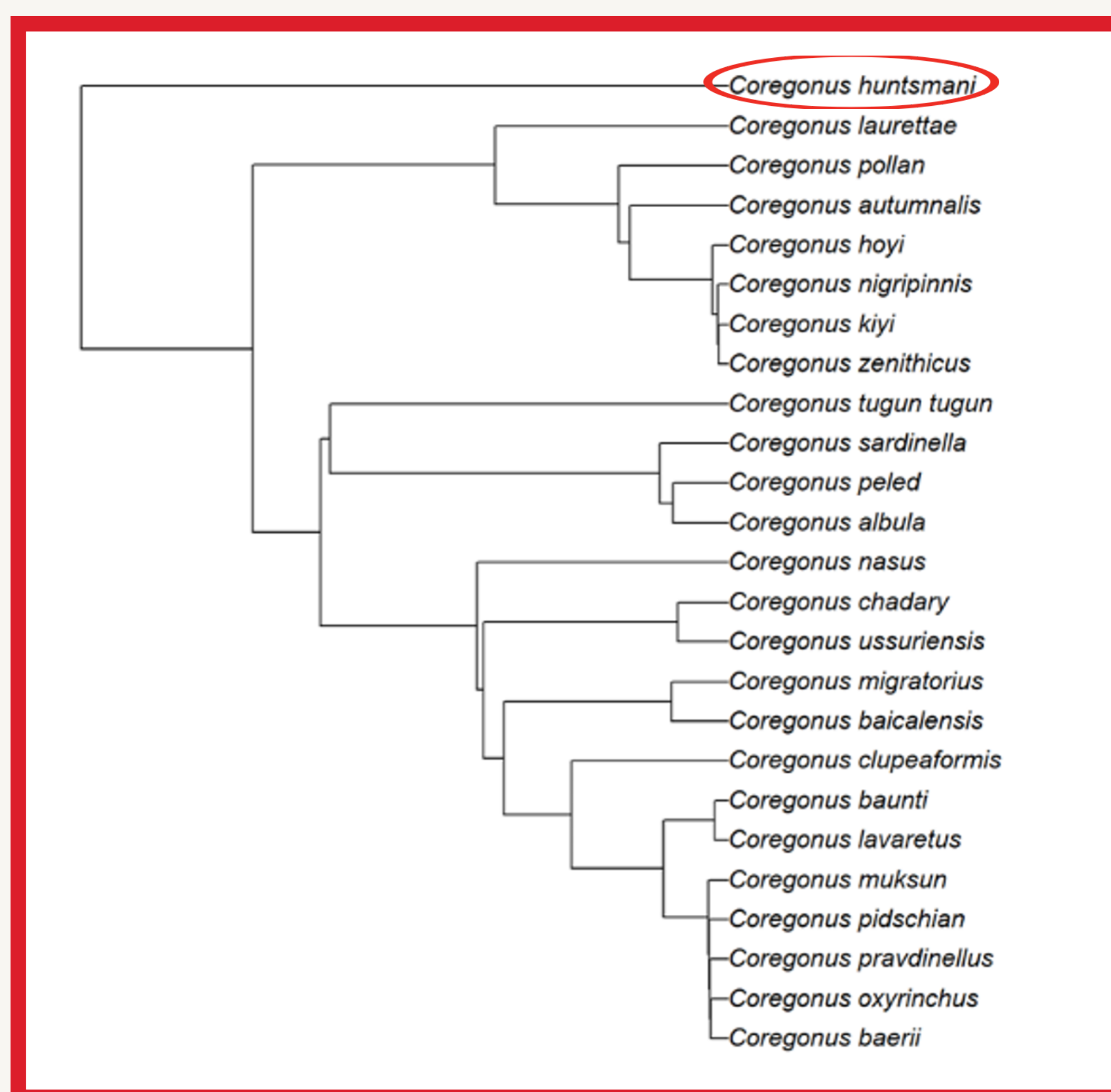


Figure 2. Phylogeny of Coregonids (Chang et al. 2019)

- The information was obtained through FishBase

Information Included:

- Lifespan
- Maximum length
- Common length
- Maximum weight
- Tail aspect ratio
- Length at maturity
- Age at maturity
- Spawning time
- Spawning substrate
- Dietary information
- Seawater tolerance

- A Principal Components Analysis (PCA) will be performed to determine how the traits cluster within the genus

Results

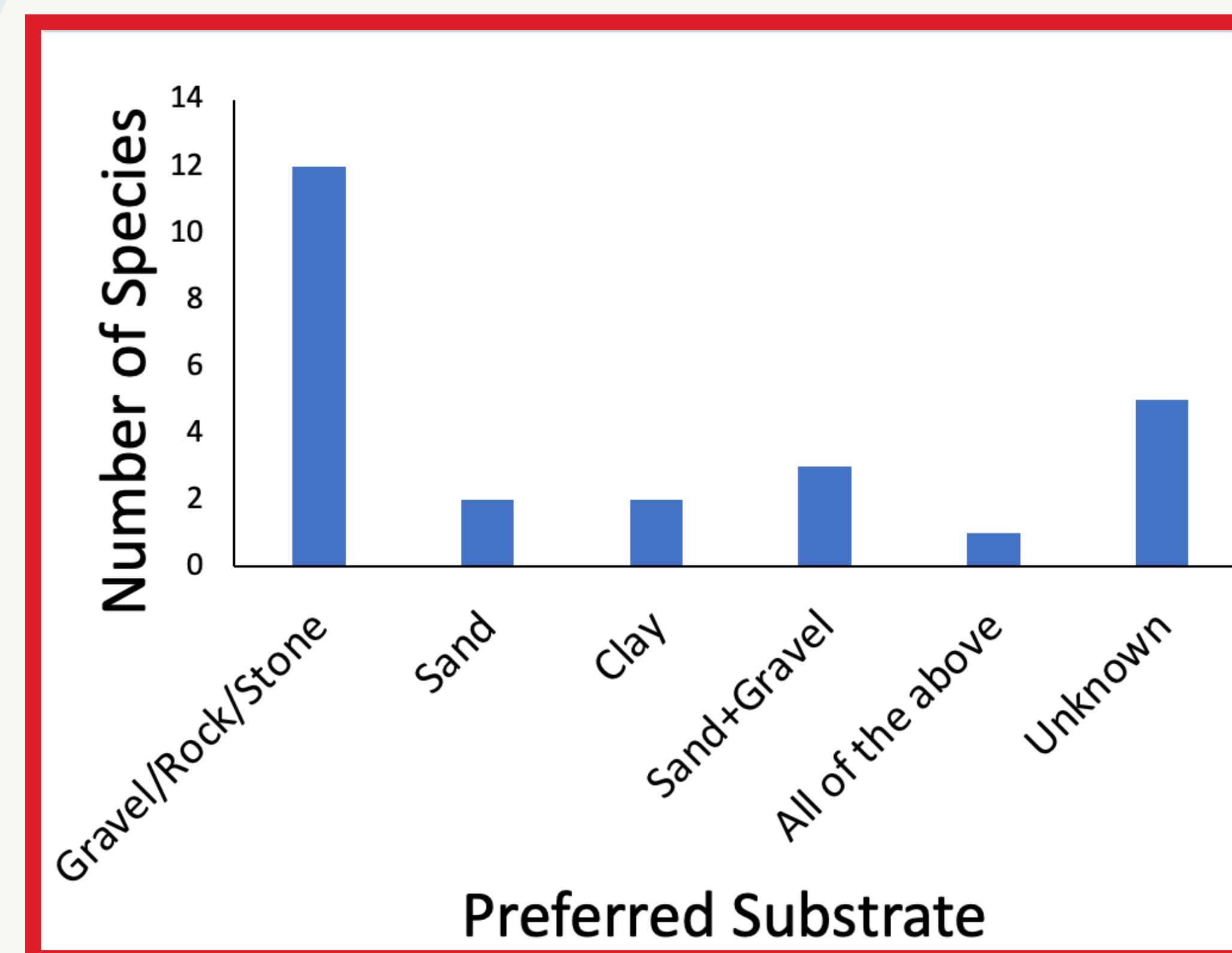


Figure 4. Preferred spawning substrate of 25 Coregonid species

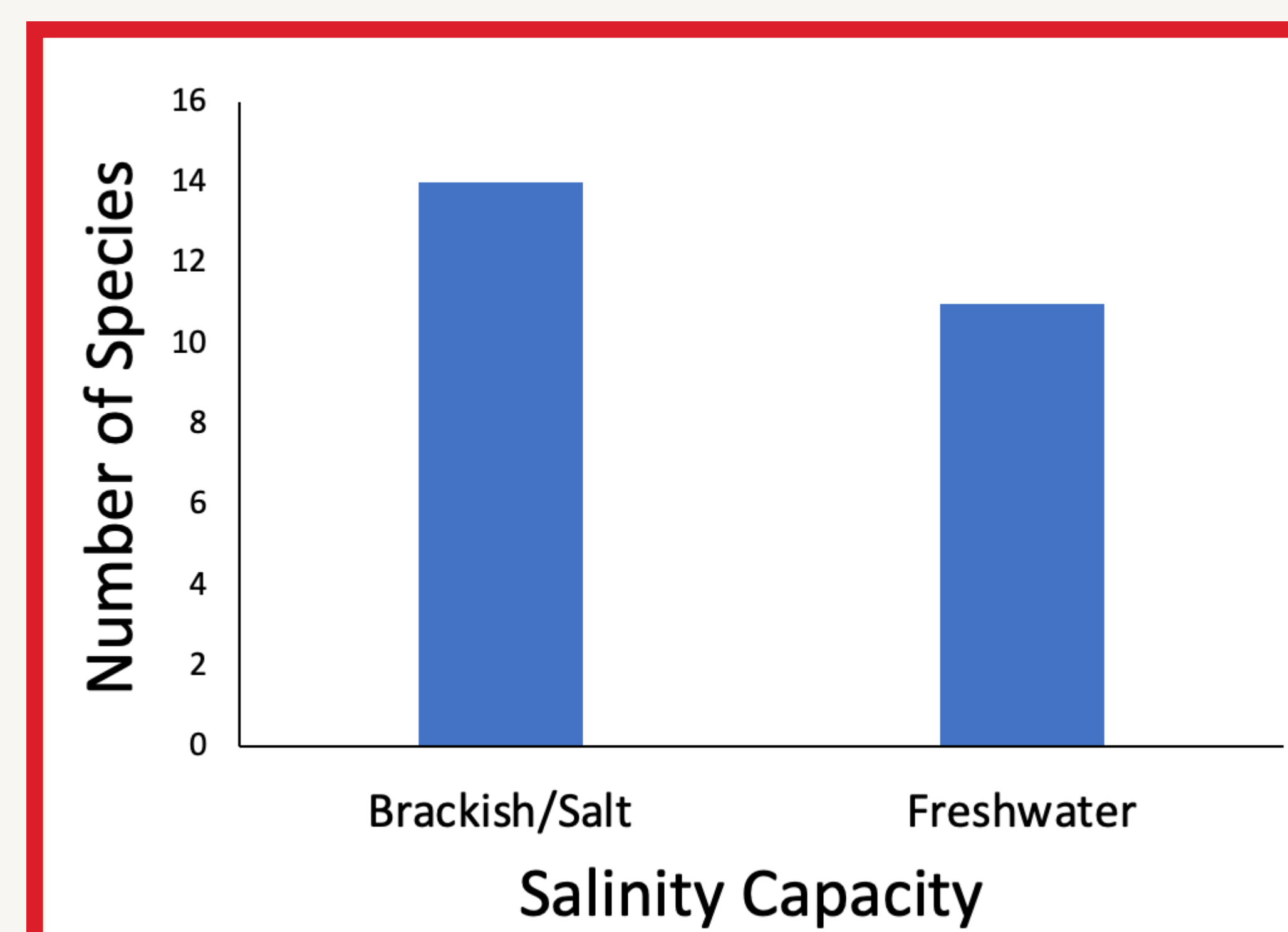


Figure 5. Salinity capabilities among 25 Coregonid species

- Gravel is the prevailing substrate (Figure 4)
- Genus could be considered euryhaline (tolerates a wide range of salinities) (Figure 5)

Next Steps

- Perform PCA analysis
- Experiments to confirm information, such as spawning substrate
- Increase public awareness for the species

Conclusion

- Information can be applied to inform management strategies in the Petite Rivière watershed (Figure 6)

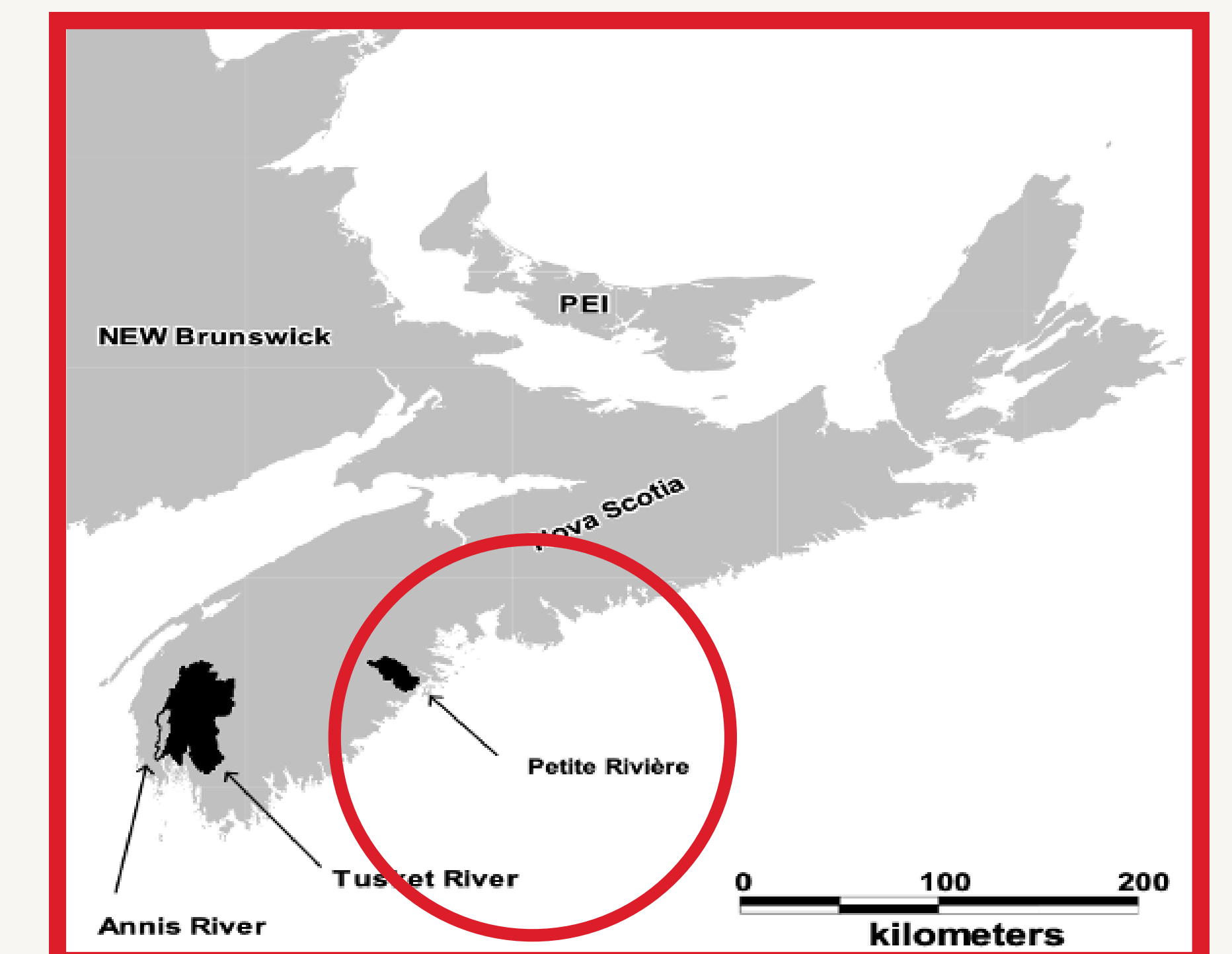


Figure 6. Current Distribution (circled in red) of the Atlantic Whitefish (Bradford et al. 2010)

Acknowledgments

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References

