The Influence of Introduced Beaver on Native Stream Ecosystems in the Cape Horn Biosphere Reserve, Chile

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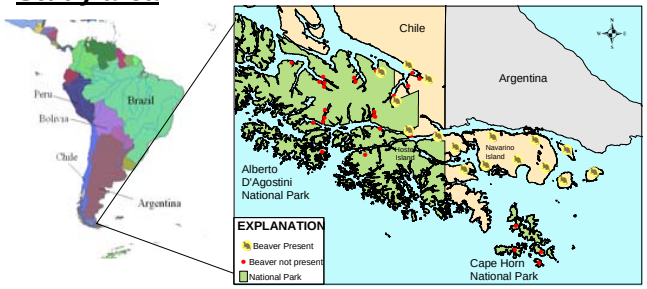
Introduction

The Cape Horn Biosphere Reserve (CHBR) is one of the world's last remaining pristine wilderness areas:

- Seventy percent of the area is national park (Alberto D'Agostini and Cape Horn)
- Beaver have become invasive since being introduced for fur and food during the early 1900's
- This study advances the understanding of the effects of invasive beaver on native stream ecology in the Reserve

Study area



Objective

Assess the impact of introduced beaver on native stream ecosystems in the CHBR

Hypotheses:

1: Beaver ponds and beaver-disturbed reaches will reduce benthic invertebrate richness and biomass

2: Native fish density will be lower in the presence of introduced beaver

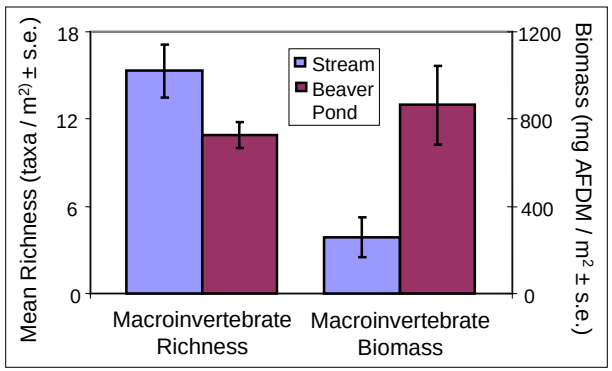
3: Beavers will increase the presence of exotic plant species

Methods

1. Samples of aquatic benthic invertebrates were collected in natural reaches and in beaver ponds
2. Fish were collected using double-pass electro-fishing
3. Watersheds were surveyed for the presence of beaver or exotic plant species

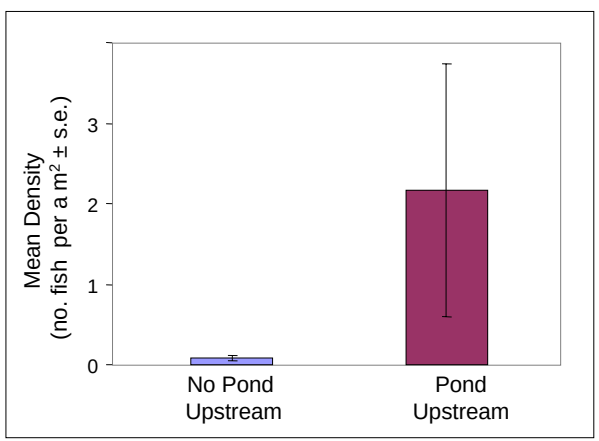
Results

Result 1: Beaver ponds caused a significant reduction ($p<0.05$) in aquatic macroinvertebrate community richness, yet the ponds caused a significant increase in aquatic macroinvertebrate biomass ($p<0.05$)

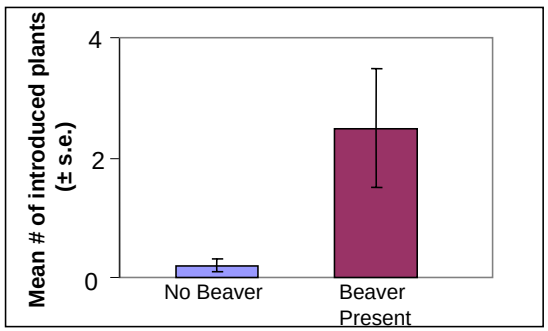


m^2 = meters squared, mg = milligram, AFDM = ash-free dry mass

Result 2: Fish density was significantly higher ($p<0.05$) in reaches located directly below beaver ponds when compared to fish density in reaches with no beaver pond directly upstream



Result 3: The presence of beavers in a watershed significantly ($p<0.05$) increased the number of introduced plant species present in Alberto D'Agostini National Park



Conclusion

- Beaver ponds caused a significant decrease in aquatic macroinvertebrate richness but increased aquatic macroinvertebrate biomass by creating a more homogeneous habitat
- The presence of beaver ponds may increase native fish density by increasing the available food resources or creating favorable aquatic habitats for native fish
- The presence of beaver in the watershed increased the number of exotic plant species by creating disturbed patches in the riparian forest

Significance

Our findings suggest introduced species, especially beaver, are on the fringes of the Cape Horn Biosphere Reserve and are altering the pristine nature of its aquatic ecosystems - Control and scientific investigation of these introduced species should be a high priority

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