Changes in juvenile American lobster density and habitat use over 30 years in Maces Bay, Bay of Fundy

Introduction

Increased lobster fishery landings over the past few decades¹ suggest an increase in lobster populations, possibly due to a concurrent decline in predatory groundfish². Reduced predation may allow early benthic phase lobsters ("EBPs", < 40 mm CL) to occupy cohesive sedimentary substrate, even though it offers poorer protection against predators³ than the lobsters' preferred⁴ structurally complex, hard bottom habitat. As lobster populations grow and juveniles saturate hard bottom habitat, expansion into less-densely occupied sedimentary habitat could remove constraints to further population growth. We compared historical and contemporary juvenile lobster densities across a gradient of sedimentary substrate cover to look for changes in juvenile density and habitat use.

Methods



In Maces Bay, in the Bay of Fundy, in the 1990s, 2000s, and 2020s, SCUBA divers counted all lobsters and described the seafloor composition (percent coverage by sedimentary substrates such as mud and sand, as opposed to gravel, cobble, boulder, bedrock) along belt transects of 200-300 m².

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1. Juvenile lobster densities decrease with increasing coverage of sedimentary seafloor (mud and mud/sand mixtures). This trend is most pronounced in the 2000s. Juvenile density for any given habitat composition (%cover) was greatest in the 2000s. 2. In 100% sedimentary habitats, juvenile densities have increased over time (from their 3. initial absence in transects in the 1990s).

Conclusions

The increased abundance of juvenile lobsters on sedimentary seafloor over the past three decades suggests more juveniles exploit cohesive sedimentary habitat than historically, possibly due to reduced predation pressure and increased survival in this habitat than in the past. As structurally complex, hard-bottom nursery grounds are often sparsely distributed, increased flexibility in habitat use could help more juvenile lobsters recruit to the population, and eventually to the fishery.

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* Only results for EBP lobsters (< 40 mm CL) are shown in this poster



References

- eng.htm
- Barshaw & Lavalli (1988) Mar Ecol Prog Ser, 48: 119-123
- 4) Wahle R, Steneck R (1992) J Exp Mar Biol Ecol, 157: 91-114





Fisheries & Oceans Canada (2021, Feb. 19) Seafisheries Landings, https://www.dfo-mpo.gc.ca/stats/commercial/sea-maritimes-

Boudreau & Worm (2010) Mar Ecol Prog Ser, 403: 181-191