

The Population Ecology Impacts of the Invasive *Littorina littorea* on Mobile Organisms in the Gulf of Maine Rocky Intertidal
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Littorina littorea is an invasive grazing snail that was transported in ship ballast water from Europe to New England in the 1800s. The herbivorous nature of *L. littorea* has a significant effect on the algal communities along the Northwest Atlantic rocky intertidal, shaping the community composition within the New England intertidal ecosystem. This organism grazes preferentially on ephemeral algae, such as *Ulva spp.*, but can consume most algae found within its rocky intertidal habitat. The selective herbivorous pressure from *L. littorea* causes some primary producers, *Chondrus crispus* and *Mastocarpus stellatus*, to populate much of the emergent substrata in the lower rocky intertidal, while ephemeral algae, *Ulva spp.*, that *L. littorea* favor are hard to find (Lubchenco, 1978). The clear change in the algae present with and without *L. littorea* likely causes a cascading effect on the populations of the mobile organisms present as well. *L. littorea* has also been known to impact sedimentation in rocky intertidal habitats, impacting the organisms capable of surviving in an ecosystem as well (Bertness, 1984).

To record the effects of *L. littorea*'s presence on the New England Rocky Intertidal ecosystem, we built fences primarily made out of PVC coated stainless steel and very fine stainless steel mesh with a thin piece of copper covering the top border of the fence. The copper portion is crucial, as *L. littorea* have an adverse reaction to moving across it, therefore keeping individuals inside or outside of the fence where they were placed. This summer, we were able to construct all 75 fences needed for this project as well as deploy fences at three sites in Harpswell and three sites in Coastal New Hampshire. Fences are still in the process of being deployed at three locations, Kent Island (New Brunswick), Schoodic Point (Maine), and Massachusetts Bay with three sites at each location. At each site experimental treatments include: one plot with natural conditions (control), one fenced plot with openings, one fenced plot with natural snail densities, and three with varying levels of manipulated snail densities (0 snails/m², 2x natural density, 200 snails/m²).

At sites where fences have been deployed, initial data regarding sedentary and mobile organisms was collected. A quadrat with 100 points was used to record the percent cover of the plot. The mobile organisms were also removed from the plot and counted for later analysis of how the diversity of the plots changed in response to their experimental treatment. This work is ongoing, so as of right now there are no explicit findings, however, the fences will remain in the intertidal for two years with data being collected regularly to see the impact of *L. littorea* on macroalgae, microalgae, and mobile organisms.



Images:

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References:

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