

Evaluating Quahog (*Mercenaria mercenaria*) Seed Grow-out Methods and Production Costs to Diversify Maine's Fisheries

Hannah Wolf¹, Marissa McMahan², Caitlin Cleaver¹, Kanae Tokunaga³, Ben Cotton³, Jessie Batchelder², Emily Farr², Diego Trevino¹



Colby College¹, Manomet Conservation Sciences², Gulf of Maine Research Institute³



Introduction

- Maine's second most valuable fishery, the soft-shell clam industry, has declined by 75% since 1980 while wild quahog populations in Maine have expanded due to warming waters and potential resistance to green crab predation ¹
- Farming quahog seed could diversify Maine's aquaculture industry by supporting municipal stock enhancement and shellfish farming, yet little is known about the commercial viability of producing seed to 12-15 mm for wild enhancement
- Our study evaluates the feasibility of quahog cultivation on oyster farms by comparing grow-out methods, abiotic factors, and production costs to create a decision-support tool for stakeholders

Mercenaria mercenaria

- a.k.a Northern Quahog, a hard shell clam ³
- Native to the Atlantic Coast and are found in sediment in the intertidal and sub-tidal zones ³
- Provides ecosystem services, can thrive in warmer waters, and prefers saline water ^{5,6,7}



Methods

- Started with 1.0 or 1.5 mm hatchery-raised seed
- Measured shell length to the nearest millimeter
- Documented equipment usage, supply costs, and labor throughout growing season
- Continuously monitored water temperature with a YSI EXO2 data sonde ⁸

Grow-out Systems

FLUPSY (FLoating UPweller SYstem)

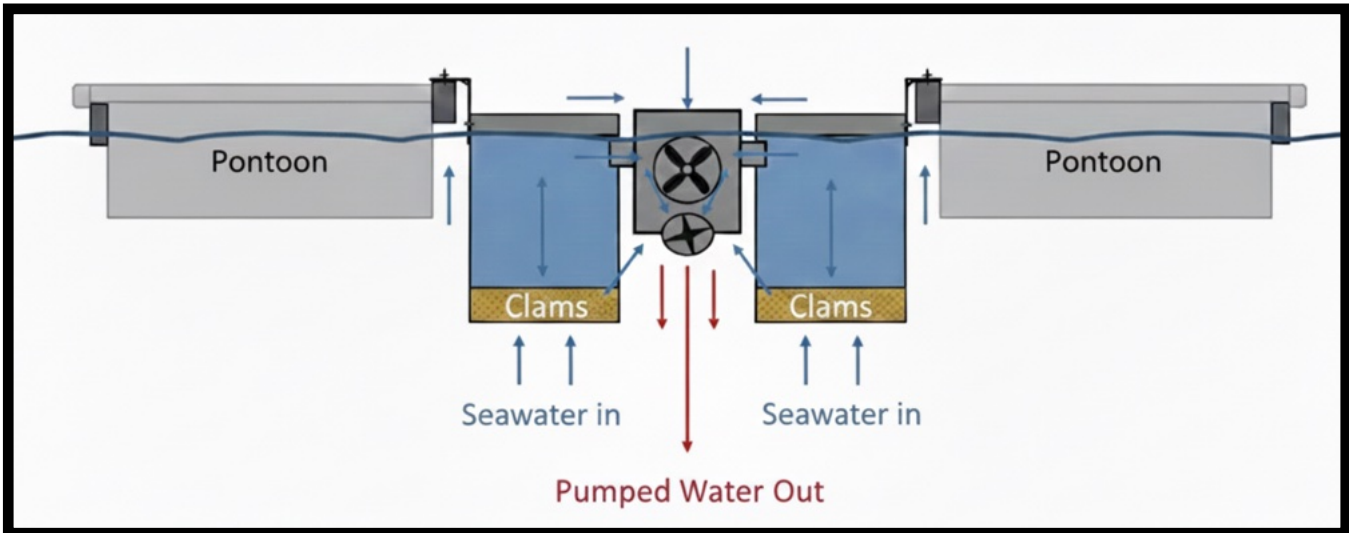


Figure 1. Diagram of a FLUPSY

Pros: Potentially faster growth and steady nutrient flow
Cons: Expensive and labor intensive

Lantern Nets

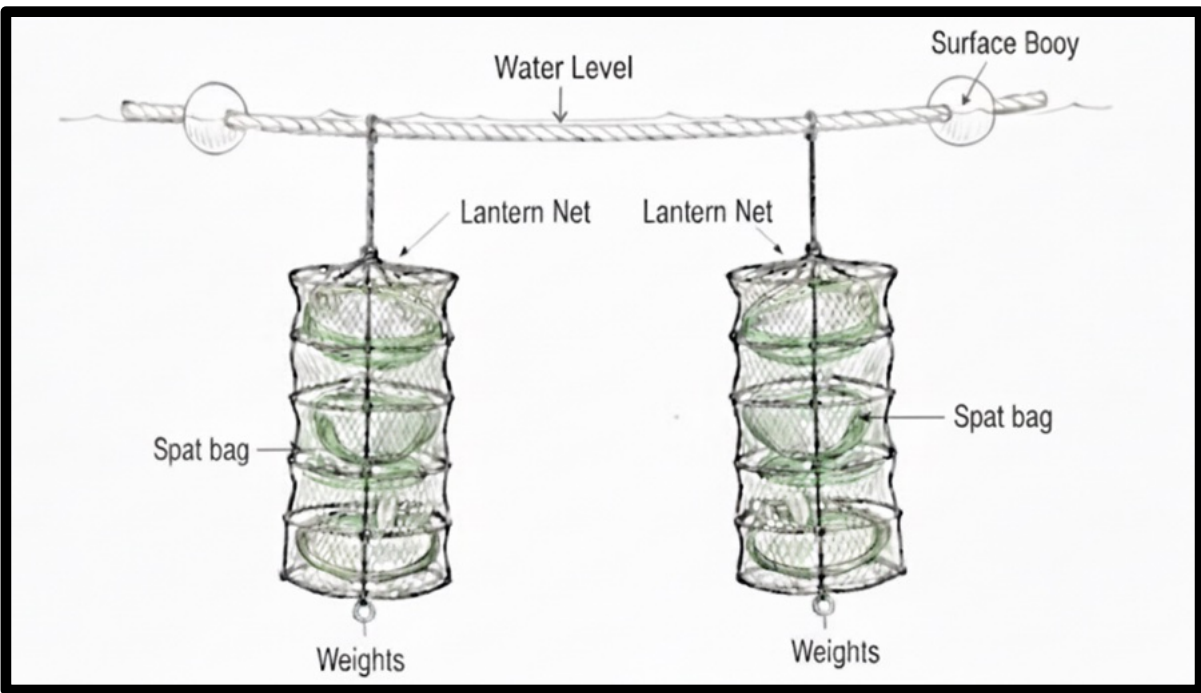


Figure 2. Diagram of Lantern Nets

Pros: Simple and cost-effective
Cons: Limited volume and potentially slower growth

Location

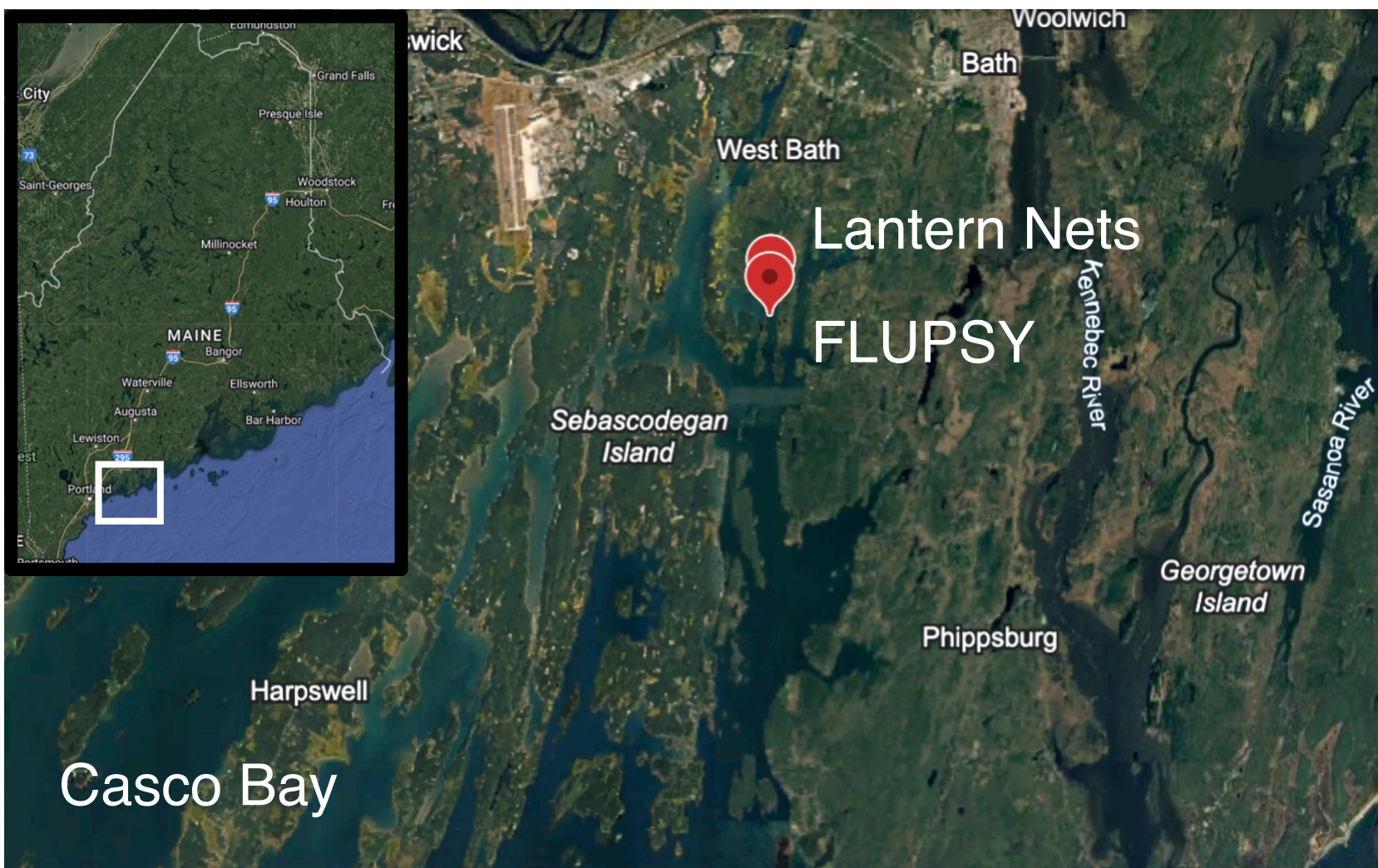


Figure 3. Map of Casco Bay, ME depicting the location of the Lantern Nets and FLUPSY

Results

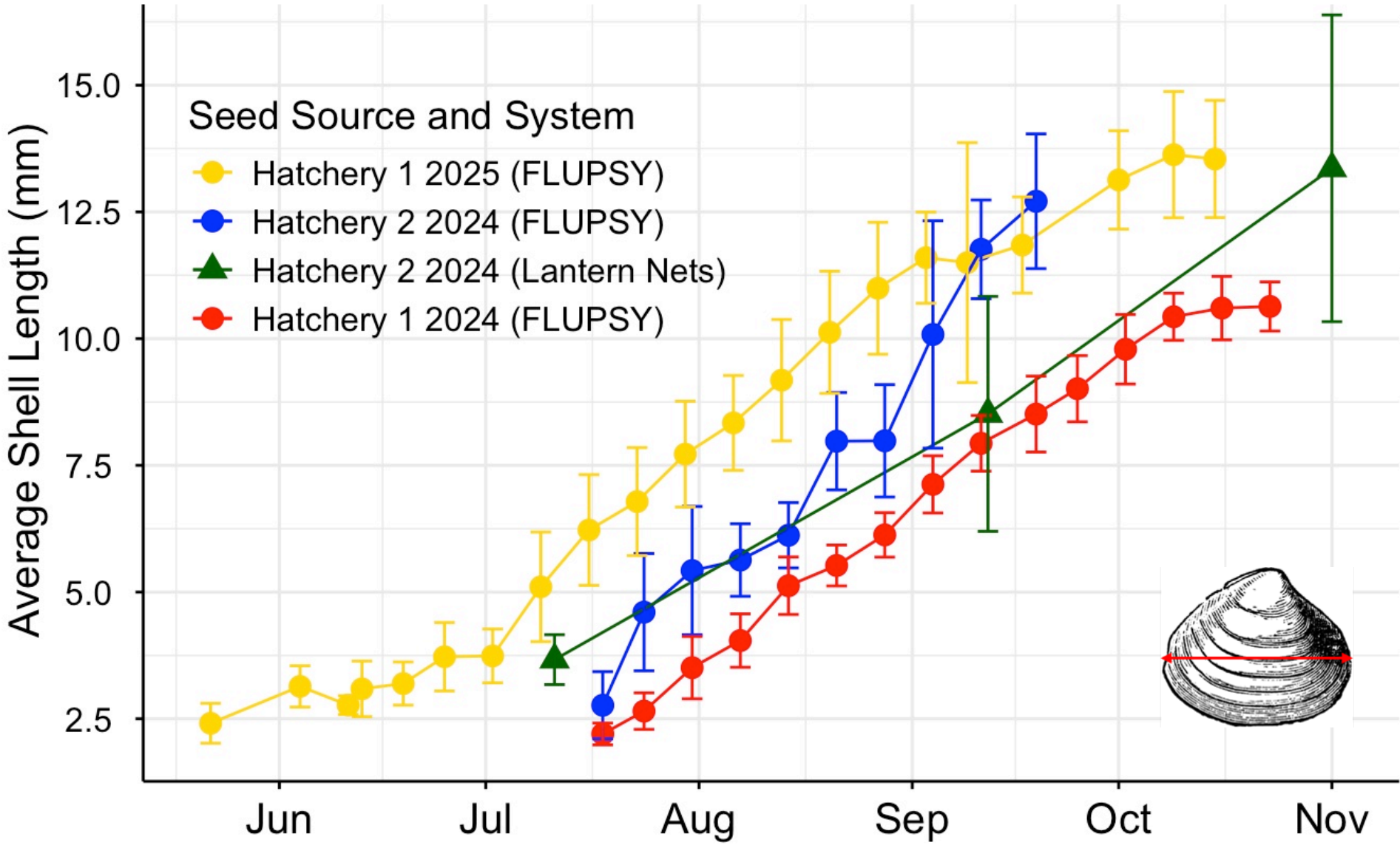


Figure 4. Average quahog shell length in 2024 and 2025 comparing FLUPSY and Lantern Nets cultivation methods and hatchery source. Error bars represent standard deviation

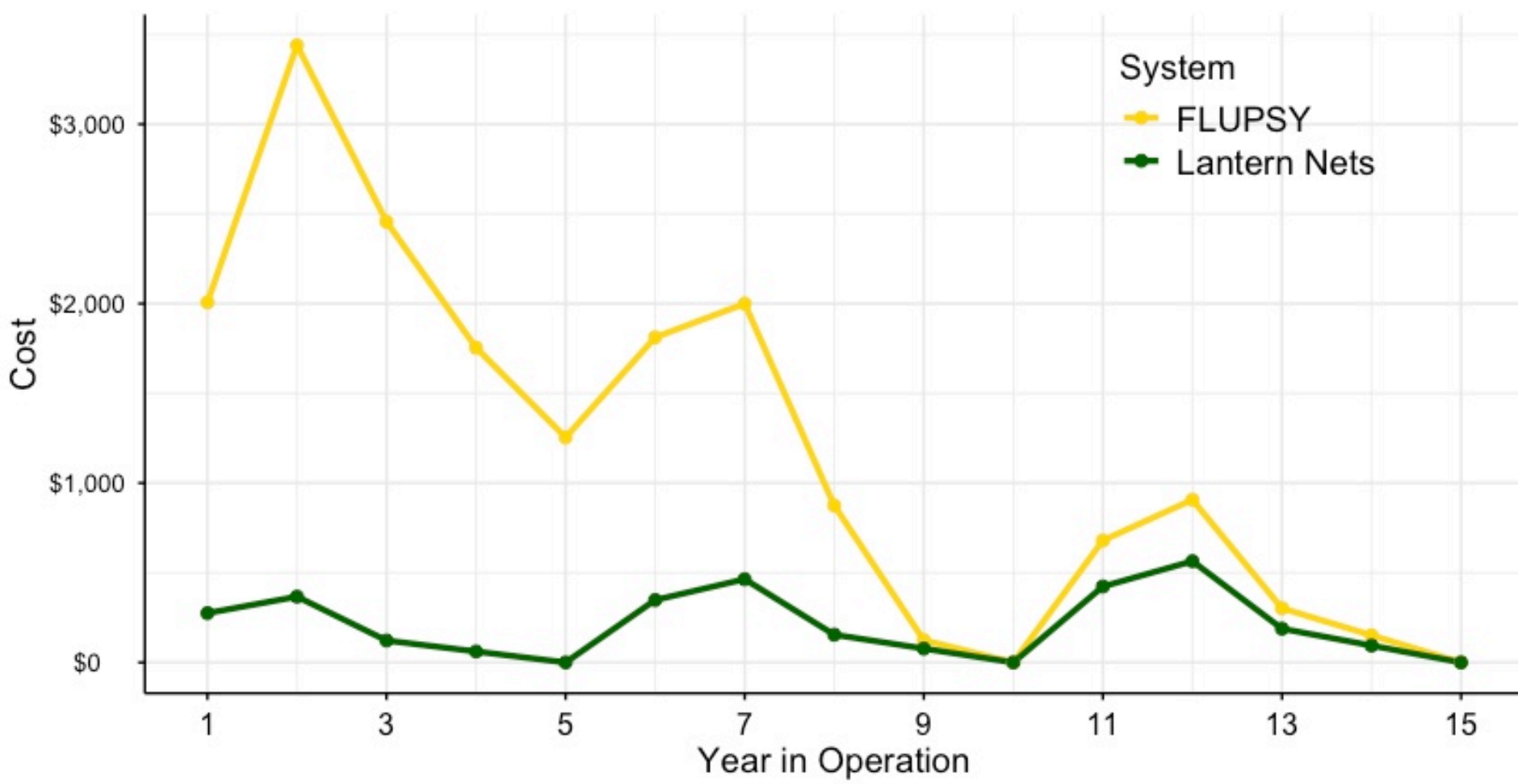


Figure 5. Preliminary total fixed cost (depreciated) analysis of FLUPSY vs Lantern Net systems over 15 years

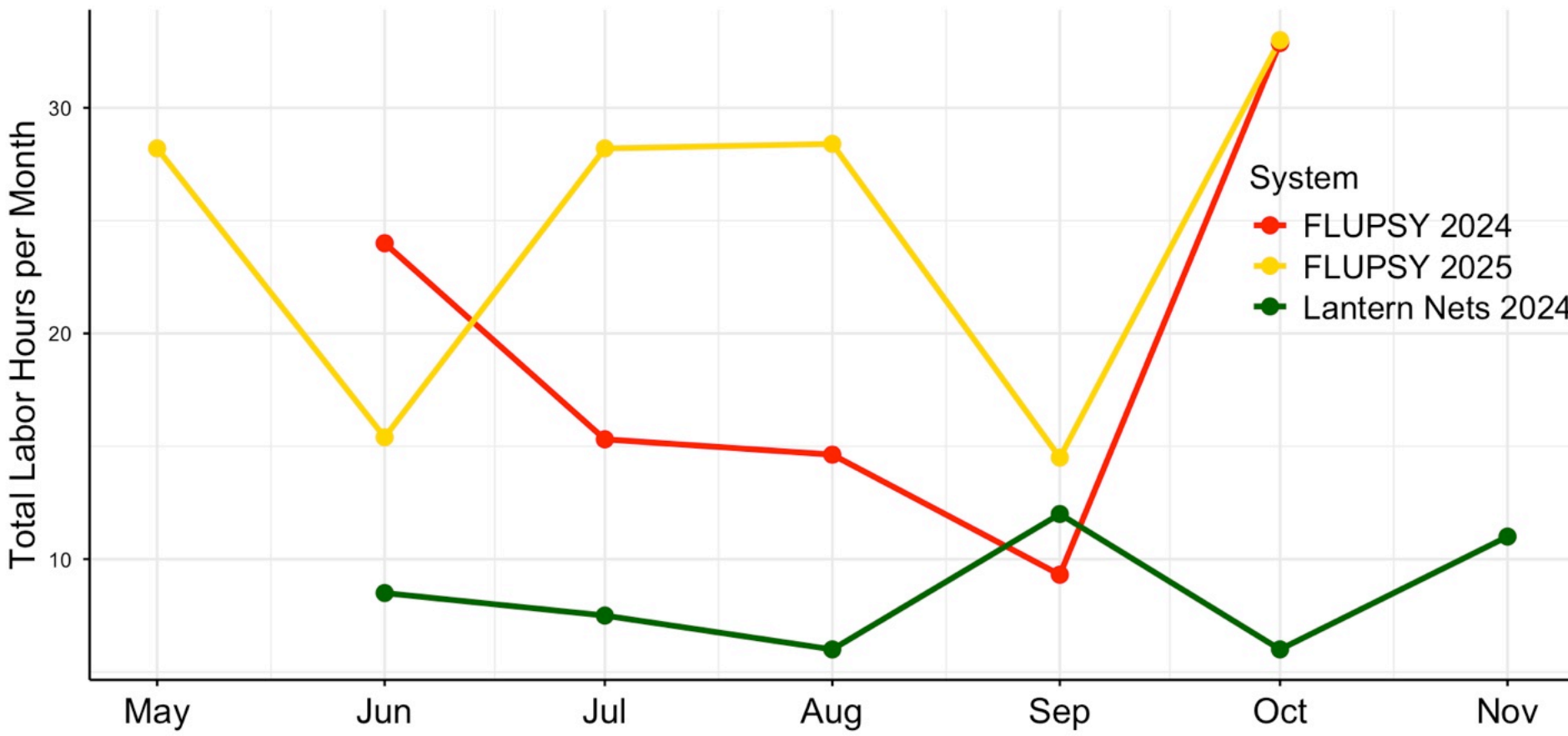


Figure 6. Total monthly operational labor hours for FLUPSY (2024-2025) and Lantern Nets (2024)

Conclusions

- Quahogs reached ~ 13mm in both systems; FLUPSY seed was out-planted to flats earlier than Lantern Net seed
- Differences in growth may be driven by varying initial seed densities and/or seed source. Overall, seed in silos at lower densities grew faster compared to seed in silos at higher densities
- Lantern Nets have lower fixed costs over time, but equipment must be replaced every 5 years
- The FLUPSY requires more setup, removal, and husbandry effort, while Lantern Nets require relatively constant but less labor throughout the season

Acknowledgments

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Please scan to see references:

