Claws for Concern: Selectivity in Green Crab Monitoring

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Background

- **European green crab (EGC; *Carcinus maenas)*** are invasive and a growing threat to the Pacific Northwest, including Yaquina Bay[1].
- Its population has exponentially increased in Oregon since 1997, disrupting native habitats (e.g., eelgrass, oyster beds) and increasing competition with native species like Dungeness (*Metacarcinus magister*) and Red Rock crabs (*Cancer productus)* [2,3].
- Effective management of EGC relies on effective population monitoring. Environmental conditions, trap type, and bait all affect catch, making it difficult to get a clear, consistent picture of the EGC population[4].
- We compared two commonly used trap types -- **Fukui** and **Gee minnow** — in Yaquina Bay, Oregon to answer:

Do catch, size, sex, and species compositions of European green crab differ by gear type in Yaquina Bay?

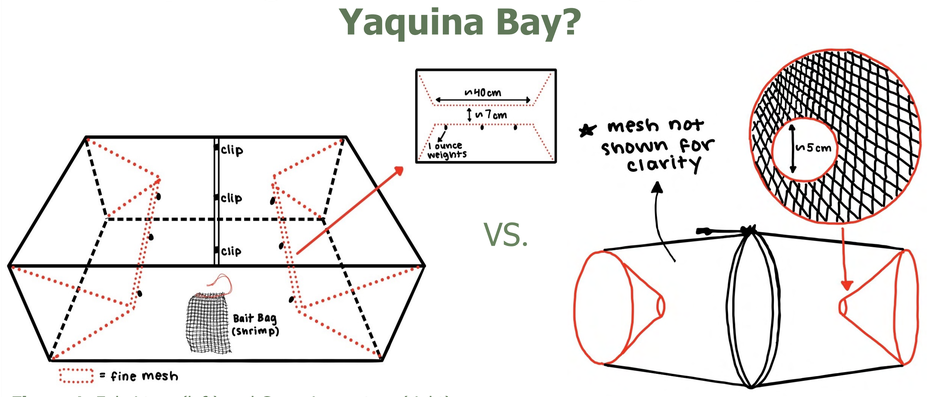

Figure 1. Fukui trap (left) and Gee minnow trap (right)

Methods

Study Area

Yaquina Bay, Oregon is an area of ecological, economic, and cultural importance to central Oregon[5]. Yaquina Bay supports considerable biodiversity and is home to many important and threatened species. Therefore, the protection of Yaquina Bay and its inhabitants is vital[5].

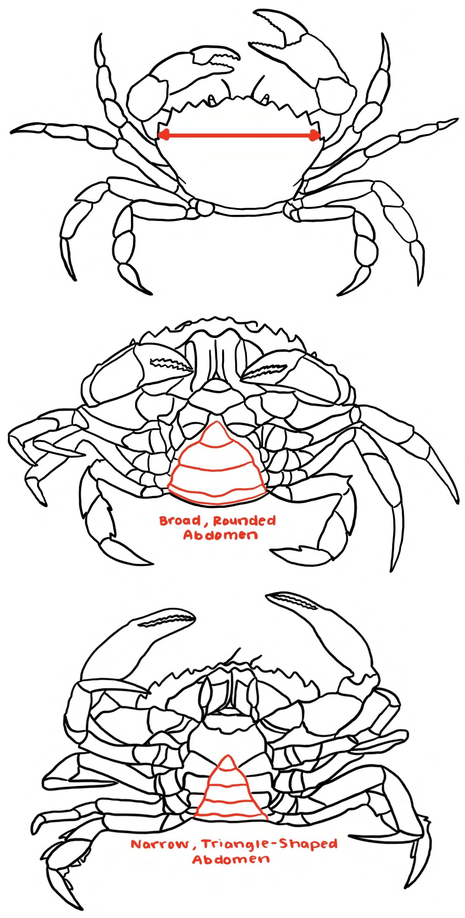

Figure 2. Carapace width measurement (mm; top) and sexing guide, female (middle) and male (bottom) for EGC.

Sampling Design

- Placed each trap type at five intertidal sites near HMSC:
  - Marina Bed (MB)
  - Pump House (PH)
  - Tree Swamp (TS)
  - Bridge Pool (BP)
  - Marsh Edge (ME)
- Baited with pink shrimp and set at low tide[6]
- Retrieved after two tidal cycles
- Sampled 3 days per week from 7/7/25 to 8/9/25

Data Collection

- EGC data:
  - sex
  - color
  - carapace width (mm)
  - missing limbs
  - presence of barnacles
- Other Data:
  - set and pull times
  - bycatch species

Results

All Sites Combined

- **Catches:** Fukui caught more crabs but with greater variability.
- **Sizes:** Fukui caught a wider range of sizes, including larger crabs.
- **Sex Ratios:** Both traps caught slightly more males.
- **Species Compositions:** Fukui caught more species but fewer individuals.

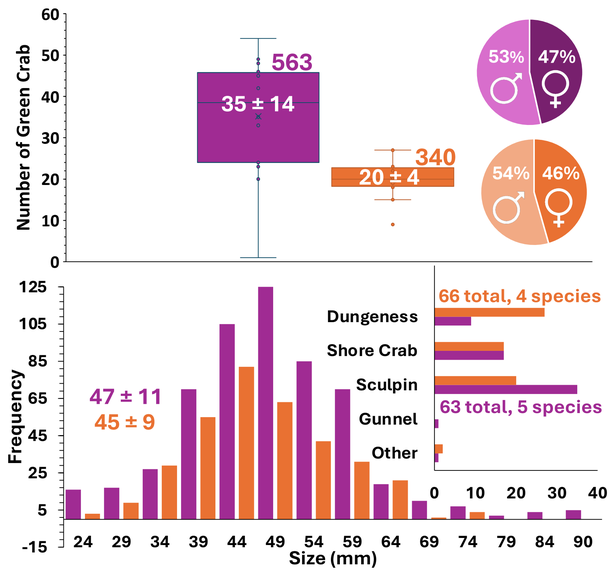

Figure 3. Species compositions (horizontal bar), sex ratios (pie), carapace widths (mm; vertical bar), and catches (whisker) by trap type (all sites)

Site-specific

- **Catches:** Differences between trap types were greatest at PH and ME.
- **Sizes:** Minnow caught a wider ranges of sizes and larger crabs at TS only.
- **Sex Ratios:** The greatest differences between trap type were at MB and TS, where sex ratios were highly skewed.
- **Species Composition:** Fukui caught more bycatch at PH, BP, and ME but a wider range of species in PH only. At ME, minnow caught >3x more Dungeness than Fukui.

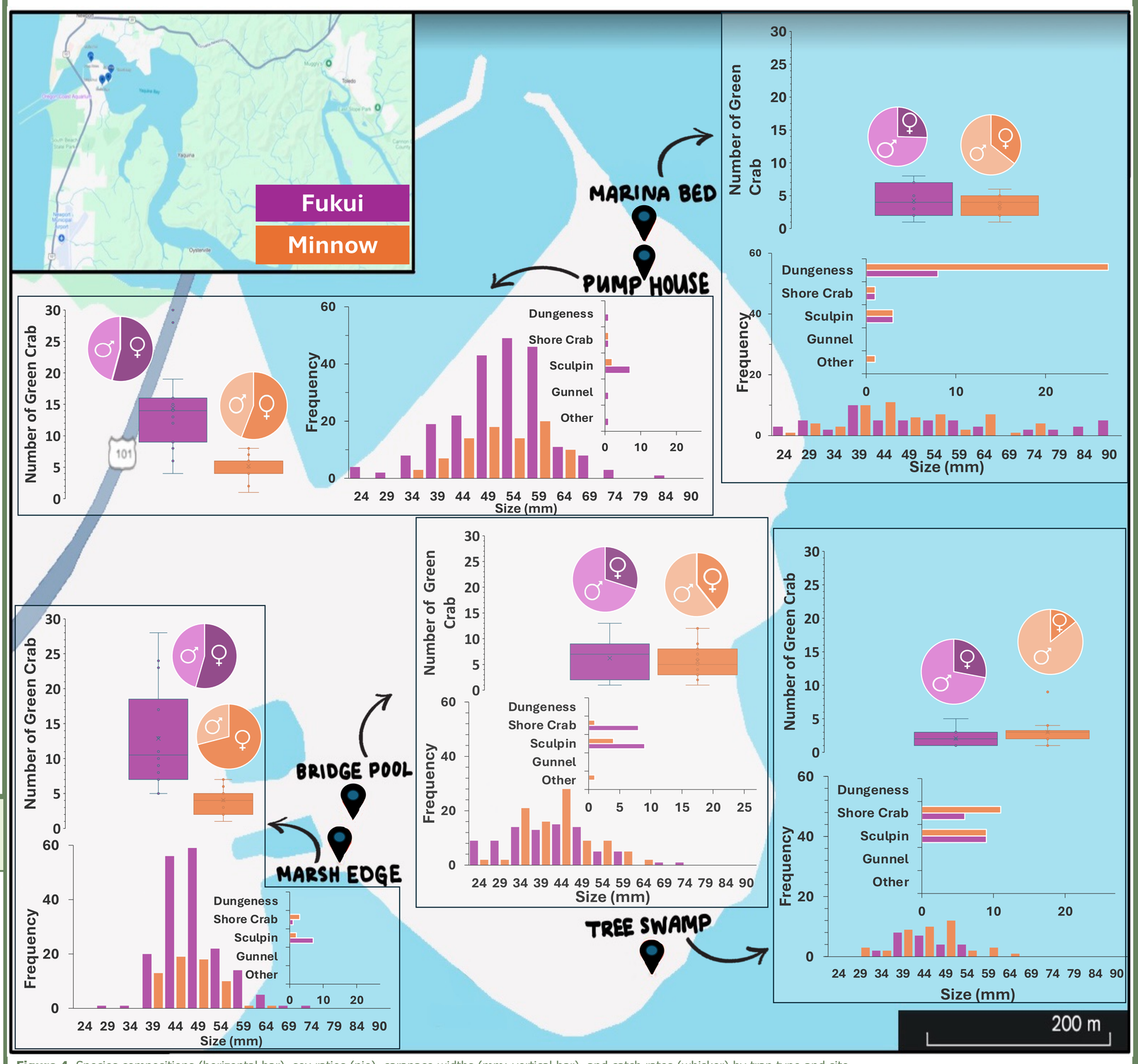

Figure 4. Species compositions (horizontal bar), sex ratios (pie), carapace widths (mm; vertical bar), and catch rates (whisker) by trap type and site.

Conclusions

- Current ODFW monitoring efforts in Yaquina Bay rely on:
  - Gee minnow traps in intertidal sites[7]
    - designed to track recruitment (smaller crabs)
  - Fukui traps in subtidal sites[7]
    - designed to sample adults (larger crabs)
- Given higher catches and wider size ranges of EGC, Fukui traps may be better suited for sampling the entire population of EGC in Yaquina Bay (small and large crabs).
- Using Fukui traps for all sites would improve comparisons across space and with other sampling programs throughout the PNW.
- **Next Steps:** Future studies on other confounding factors, such as bait and site selection, could allow for a better understanding of biases between trapping efforts.

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References

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