

Crab Team Coastal Monitoring Site Summary 2024

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Background

This is an visualized summary of 2024 Washington Sea Grant Crab Team data from monitoring sites in coastal estuaries. Eleven total coastal Crab Team sites were monitored again in 2024, with one pre-season site adjustment made due to site access concerns: monitoring in the Aberdeen area changed from *Aberdeen, 607* to *Newskah, 612* (tinyurl.com/wagreencrab). All sites were surveyed for European green crabs (CAMA) and associated intertidal and shallow subtidal communities using Fukui and minnow (1" opening) traps and via molt surveys from April through September as per standard WSG monitoring protocols.

A notable trend not captured in these figures is that in 2024, hand captures were much more common across the network sites than in previous years. In some cases hand captures comprised the overwhelming majority of crabs captured during monitoring activities.

2024 Hand capture totals, by site:

Makah Bay

- *Wa'atch, site 604*: **54**
- *Tsoo-Yess, site 611*: **4**

Grays Harbor

- *Ocean Shores, Site 603*: **0**
- *Brady's Oyster, site 605*: **1**
- *Grays Harbor National Wildlife Refuge (NWR), site 606*: **0**

Willapa Bay

- *Stackpole, site 600*: **2**
- *Nahcotta, site 601*: **1**
- *Tokeland, site 602*: **4**
- *Cutthroat Creek (Willapa NWR), site 609*: **0**
- *Dohman Creek (Willapa NWR), site 610*: **2**
- *Newskah, site 612*: **0**

Figure 1. Cumulative Number of CAMA Captured

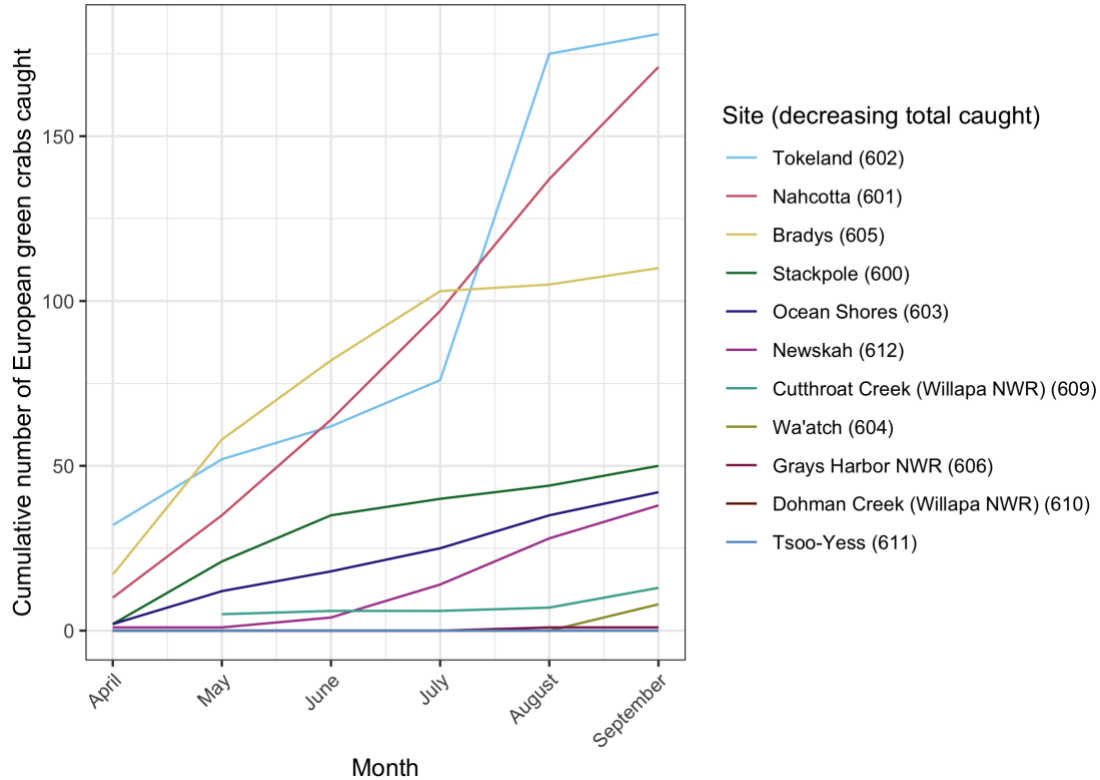


Figure 1 shows the cumulative total number of CAMA captured in traps at each of the sites across the 2024 season. Tokeland captured the most CAMA (181), largely driven by the greatest single month capture on record to date (99 crabs in a single survey in August). Nahcotta (Paul’s Slough) captured the second greatest total of green crabs (168), with highly consistent captures throughout the season (indicated by a very straight line). Brady’s had the third highest capture rate of the season (110), with capture rate increases that outpaced all other sites in the early season giving way to much lower numbers into Fall. Stackpole, Ocean Shores, and Newskah, the latter in its first season of monitoring this year, captured the fourth, fifth, and sixth highest totals, respectively, capturing fewer than 15 CAMA per site total over the entire year. Note that two sites (*Dohman Creek, 610* and *Tsoo-Yess, 611*) did not trap any green crabs, but did report several hand captures (2 and 4, respectively).

Figure 2. CPUE of CAMA Across Sites and Years

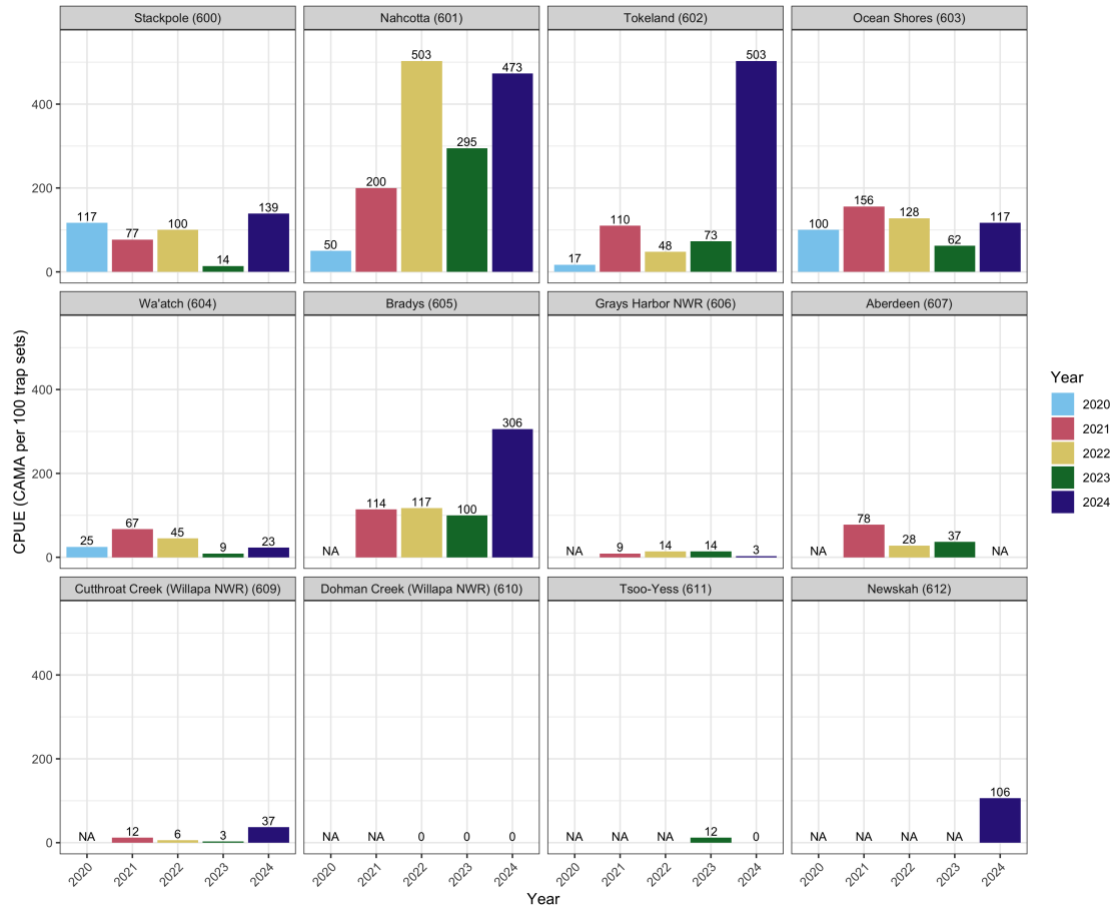


Figure 2 shows catch per unit effort of green crabs (CPUE, per 100 trap sets) across all sites since coastal Crab Team monitoring was piloted in 2020. Note that in 2020, sites were sampled in August and September only. The number above each bar indicates the CPUE value for that site and year, and “NA” indicates the site was not established during that year. Unlike in previous years where Nahcotta consistently saw the highest CPUE of all the coastal sites, in 2024, Tokeland had the highest, driven by a spike in captures in August 2024. The majority of coastal sites saw a substantial increase in CPUE as compared to 2023 numbers, though for many sites including Stackpole, Ocean Shores, and Wa’atch, 2024 was a return to levels more consistent with earlier years of monitoring.

Figure 3. EGC Size Demographics in 2024

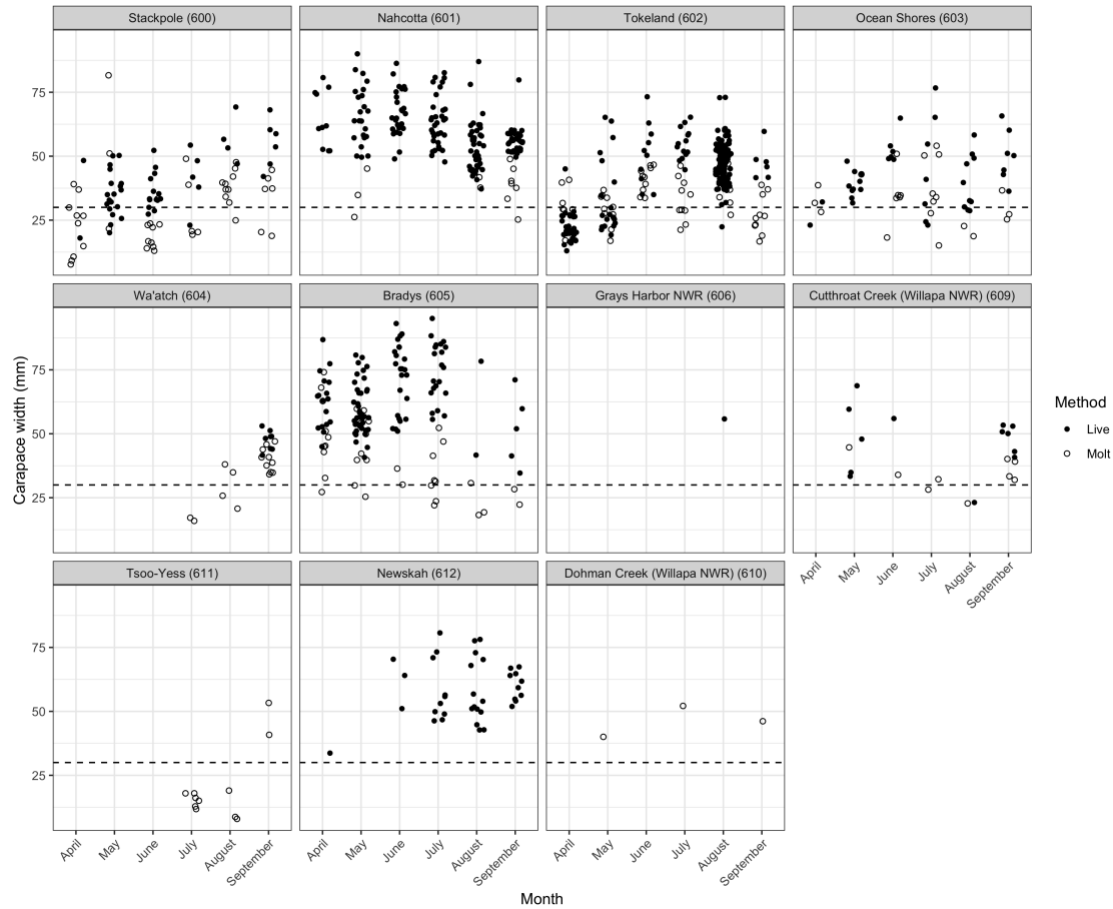


Figure 3 shows the sizes of live CAMA and green crab shells recorded at each site over the 2024 season. Solid points represent live crabs and open points represent molts and dead crabs. The dotted line shows a size below which any crab is considered young of year (YOY, carapace width < 30 mm). Note, however, that the 30mm cutoff used here is a conservative estimate since late in the season (July – September), YOY crabs can reach up to 55mm. Thus, any crab under 30mm at any time of year is confidently considered a young of the year, but by midsummer, a more nuanced cohort analysis is needed to determine which crabs are YOY.

Nahcotta and Brady’s, both sites near shellfish aquaculture operations, captured the largest crabs. Meanwhile, Stackpole, Tokeland, Wa’atch, and Tsoo-Yess, all sites that have been trapped extensively in previous years, recorded smaller crabs on average and fewer crabs in the >70mm size group relative to the overall catch. This could be an indication of “crabbing down” the population size.

For the 4 sites that captured YOY in traps, the early season pulse (April and May) was most pronounced, though a smaller number of YOY could also be found throughout the remainder of the season. Additional captures by hand often included YOY, but without consistent measurements of those retained crabs, we have not included them here. Many of the YOY were detected as molts (found at 8 of 11 sites), showing the importance of both

live trapping and molt searches in better understanding how population structure varies over space and time.

Figure 4. CAMA Size Demographics Across Years

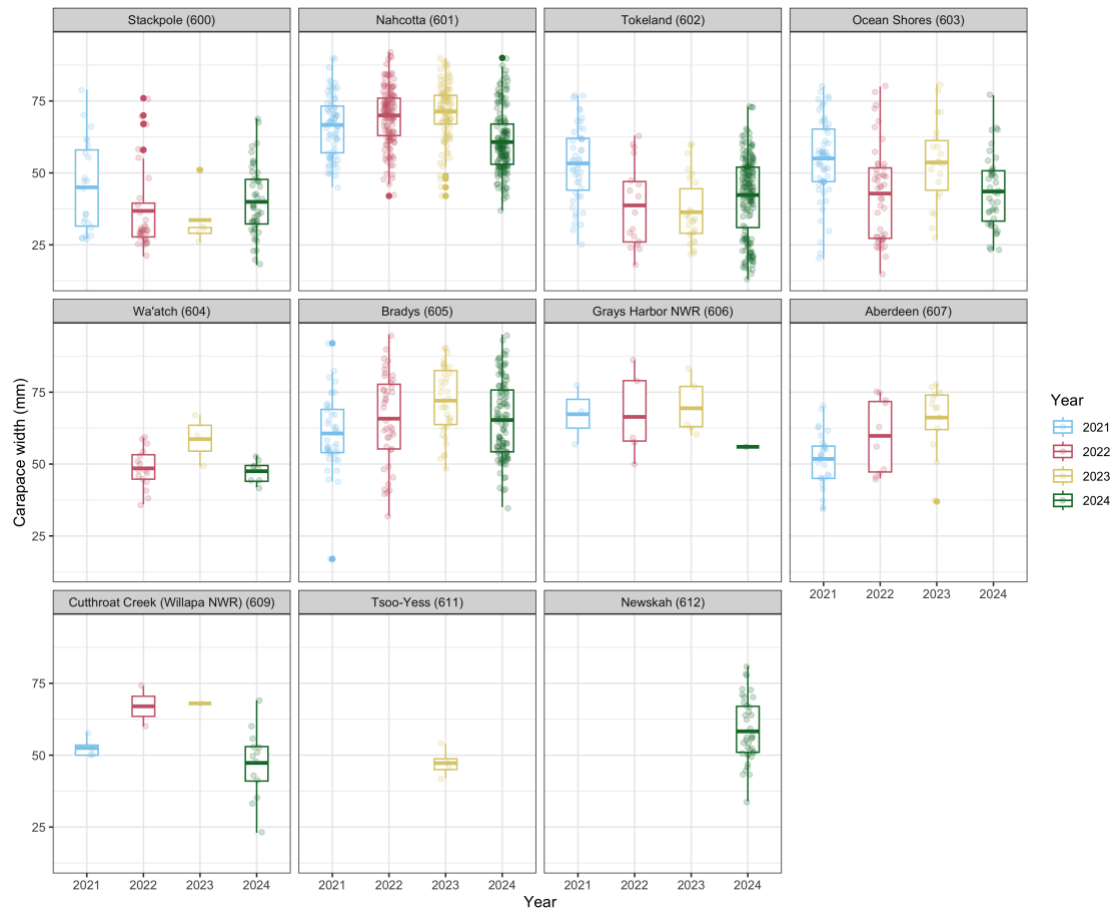


Figure 4 shows box plots of CAMA sizes from 2021 to 2024. The thick line in the middle of each box represents the mean carapace width. In 2021, the Wa'atch was sampled in April only and therefore sizes are not included for that year. This year, CAMA sizes were more varied at Stackpole, Nahcotta, Tokeland, Ocean Shores, Brady's and Cutthroat Creek, indicating a departure from last year's pulse of similarly sized captures. Greater numbers of smaller crabs at Tokeland, Brady's, and Cutthroat Creek reduced the average size for crabs at those sites, while for Stackpole and Nahcotta, the opposite trend was apparent.

Figure 5. Differences in Community Metrics Across Sites in 2024

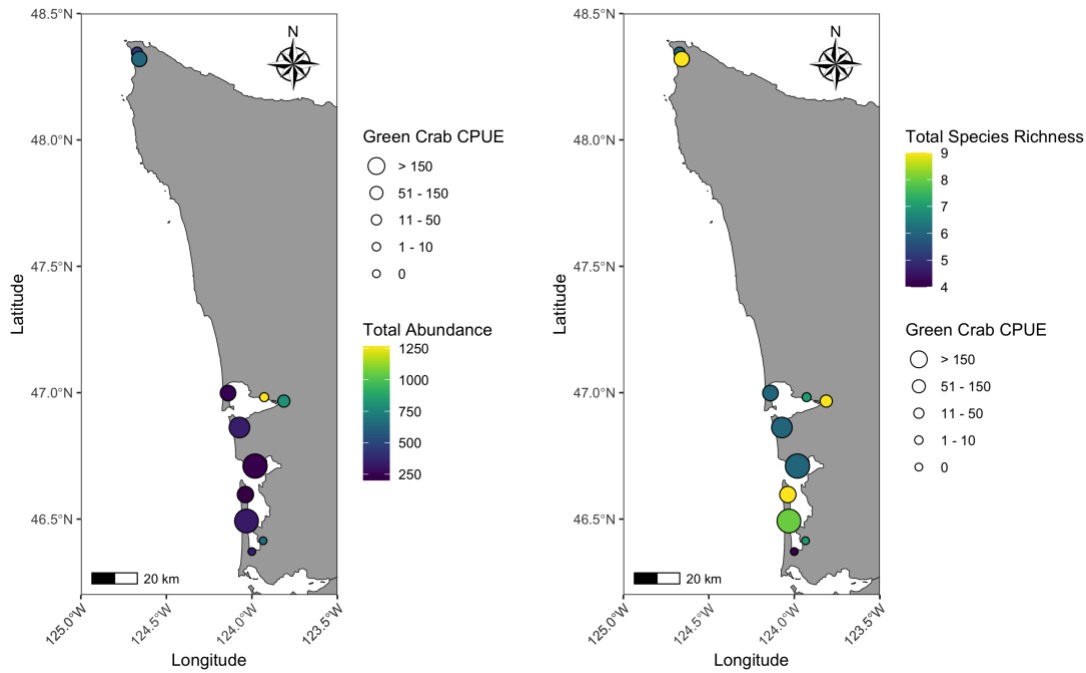


Figure 5 shows the CAMA CPUE as size of circle while the color represents abundance of individuals (left) and total species richness (right, number of all types of organisms including green crabs) captured in traps. There doesn't appear to be a strong correlation between CAMA CPUE and total abundance, though sites with greater CAMA totals tended to be sites with lower total abundance of organisms captured. Additionally, no apparent correlation existed in this year's data between CAMA CPUE and species richness.

Figure 6. Community Composition Across Sites in 2024

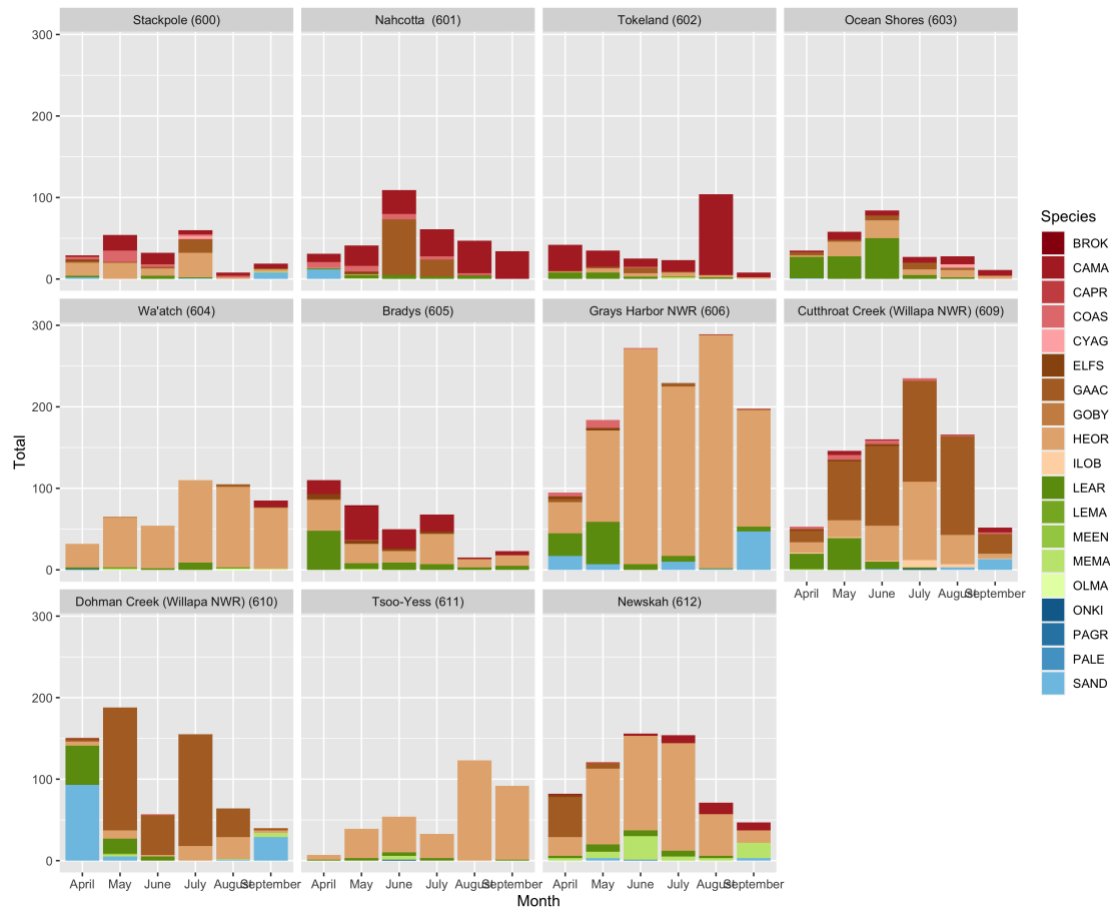


Figure 6 shows community composition through colors and total abundance in the height of each bar by site and month. The most common species found was the hairy shore crab (HEOR), which were common at every site except Nahcotta in 2024. At some sites, seasonal peaks of organismal abundance were clear but the timing of the peak may have been driven by different species. For instance, the mid or late season peaks are often the result of a high relative abundance of HEOR at a site (e.g. Grays Harbor NWR), while early season peaks are sites with a greater number of staghorn sculpin (LEAR, e.g. Brady's). These species are typically drivers of overall abundance and seasonality at their sites, but both CAMA and three spined sticklebacks (GAAC) were important drivers of seasonal abundance at a few sites as well (e.g. Tokeland, Cutthroat, and Dohman).

Figure 7. CAMA Size Across the 2024 Season

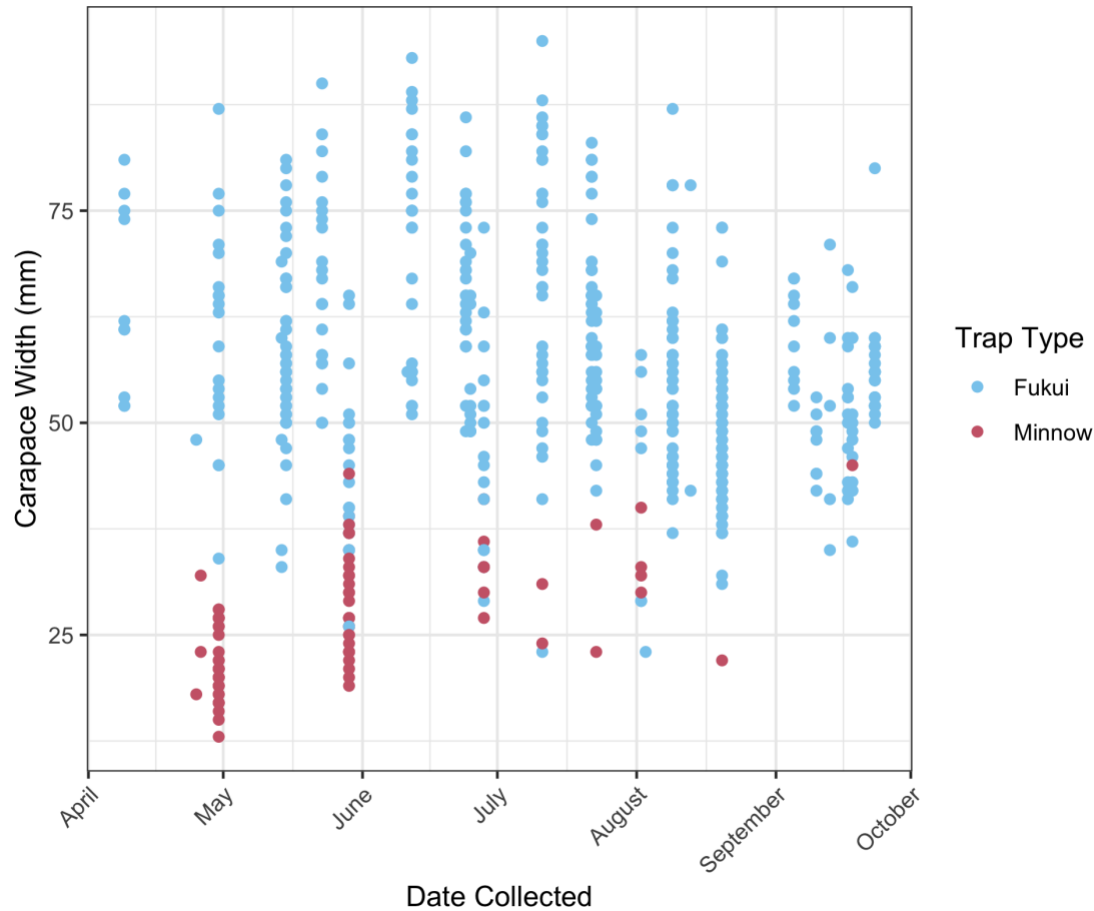


Figure 7 shows CAMA size across the season for all sites, with blue dots representing Fukui trap captures and red dots representing 1” minnow trap captures. In this protocol, the minnow trap outperformed Fukui traps in capturing the smallest segment of the population. These observations underscore the importance of using both trap types to fully characterize the size structure of a CAMA population. These observations also emphasize that, on average, the most concentrated arrival of YOY at the network sites was timed in May (showing some growth into June), with a smattering of later arriving YOY being captured into August and September. It’s also notable that in the later months of trapping, the very largest crabs (>70mm) become less numerous in traps relative to the middle-sized CAMA. One possibility is that these crabs have been “fished out” of the local population, but it is also possible that they have started to spend more time in deeper water, thus out of range of monitoring traps, as the tides begin to shift.