

Supplemental Information

Figure S1: Growth kernel, $G_t(x', x)$ (Equation 6), that describes the probability of transitioning from size x to size x' at time t . Results show the probability of growing from x to x' over a two week period (i.e., t to $t + 1$) when t corresponds to April 1st, July 1st, October 1st, and January 1st. Red dashed line shows the line where $x' = x$.

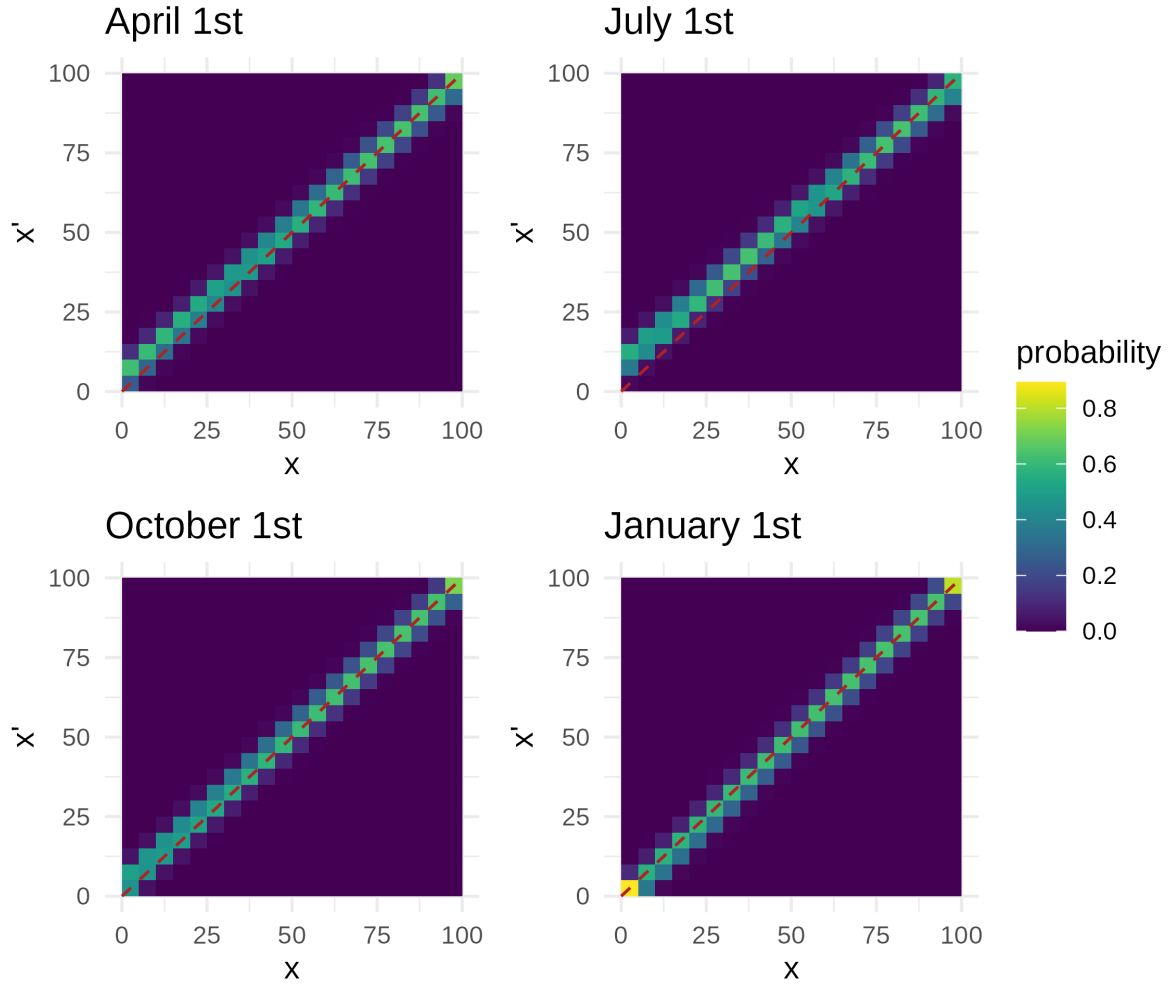


Figure S2: Population forecasts in response to varying removal efforts, relative to no removal. Size distributions show the ratio of the equilibrium crab abundance in each size class, $N^E(x)$, when no removal occurred ($N^E(x)_{\text{effort}=0}$) relative to a removal effort greater than zero ($N^E(x)_{\text{effort}>0}$). Ratios are calculated based on size-structured abundance at the end of the year after overwinter mortality when 112 traps, 560 traps, or 2800 traps were applied evenly over a trapping season of 14 biweeks with either *A.* Fukui traps, *B.* Minnow traps, or *C.* Shrimp traps. A ratio of one means that the size-structured abundance after no removal equals the size-structured abundance after application of Z traps. A ratio less than one means that the application of Z traps removes decreases the size-structured abundance, relative to no removal. A ratio greater than one means that the application of Z traps increases the size-structured abundance, relative to no removal. Solid line indicates the median size-structured abundance across simulation replicates, and the shaded area indicates ± 1 standard deviation across simulation replicates.

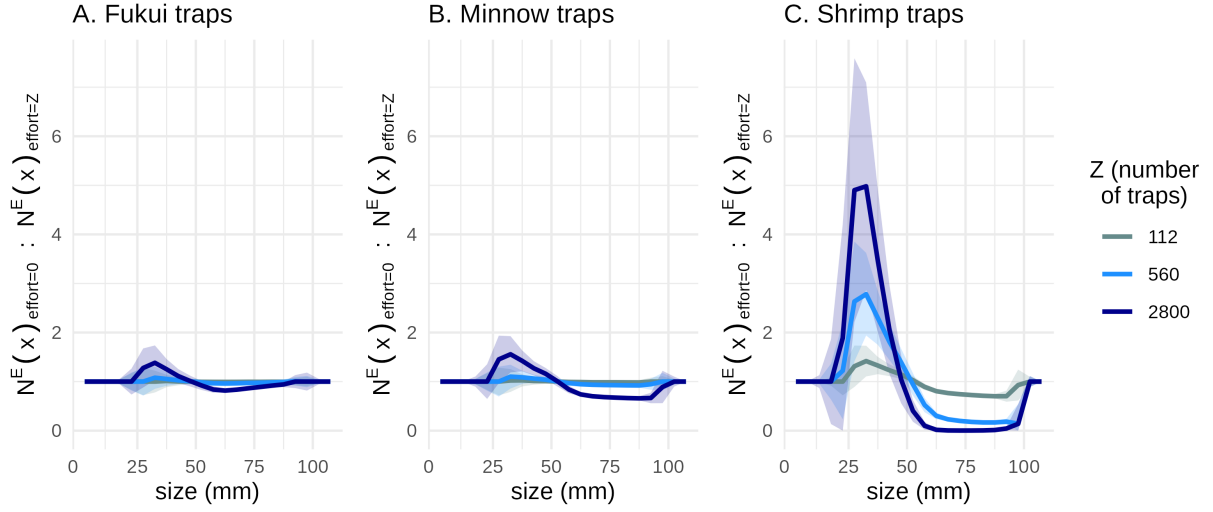


Table S1: Total equilibrium abundance across all size classes, N^E for population forecasts in response to varying removal efforts. Mean refers to the mean N^E across all simulation replicates, and sd refers to the standard deviation of N^E across all simulation replicates.

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| type | effort | N^E (mean) | N^E (sd) |
|--------|--------|--------------|------------|
| NA | 0 | 269.5 | 64.9 |
| Fukui | 28 | 269.2 | 64.8 |
| Fukui | 112 | 268.3 | 64.5 |
| Fukui | 560 | 263.3 | 63.1 |
| Fukui | 840 | 260.1 | 62.2 |
| Fukui | 1400 | 254.1 | 60.6 |
| Fukui | 2800 | 239.4 | 57 |
| Minnow | 28 | 268.9 | 64.7 |
| Minnow | 112 | 267 | 64.2 |
| Minnow | 560 | 256.7 | 61.5 |
| Minnow | 840 | 250.4 | 59.9 |
| Minnow | 1400 | 238.1 | 57 |
| Minnow | 2800 | 210.1 | 51 |
| Shrimp | 28 | 256.8 | 61.6 |
| Shrimp | 112 | 222.3 | 53.7 |
| Shrimp | 560 | 118.2 | 38.5 |
| Shrimp | 840 | 94.1 | 36.4 |
| Shrimp | 1400 | 75.8 | 34.1 |
| Shrimp | 2800 | 63.5 | 30.1 |