2023 Lobster Monitoring Update

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**Heather Glon: Larval Survey**
Robert Russell: Settlement Survey
Rebecca Peters: MENH Inshore Trawl Survey

GENERAL SEA SAMPLING RESULTS

In 2023, the Lobster Sea Sampling Program completed its 39th season. We completed 160 trips on 142 boats from 52 different ports. We measured 184,150 lobsters from 36,812 commercial lobster traps. These data are essential to the ASMFC Lobster Stock Assessments by providing general biological and discard information to inform management models.

The Sea Sampling Program is designed to cover 3 trips in each lobster management zone each month from May-November. During the winter months, we complete at least one trip per statistical area every month but finding winter trips is challenging due to weather as well as vessel and personnel availability.
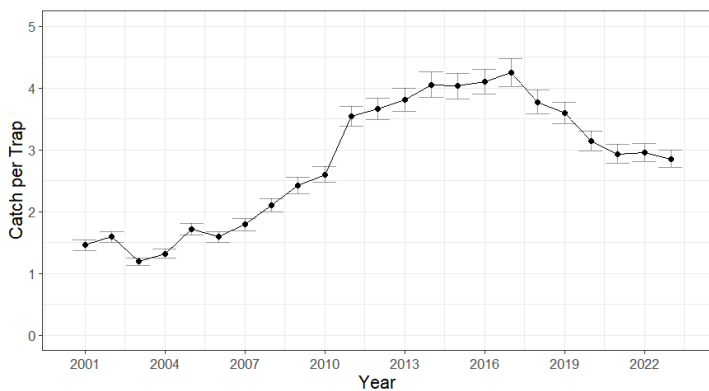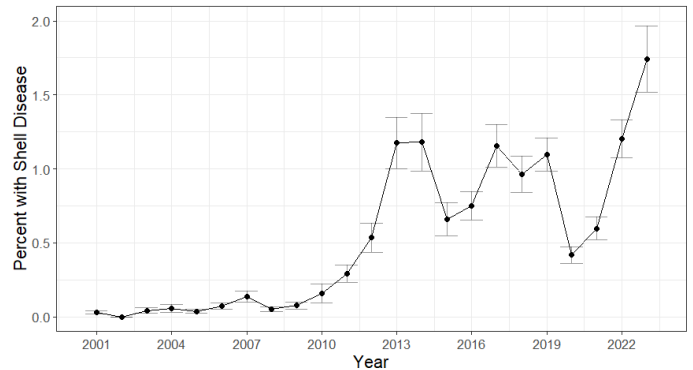

Standard Error represented by thin vertical bars. Figure includes trip data from May to November, 2001-2023.

Figure 1. (above) Sea Sampling sublegal (<83mm CL) catch per trap (total # lobsters/total traps measured by trip) for all zones combined (2001-2023).

- In 2023, sublegal lobsters continued to maintain roughly the same observed catch per trap as 2022. Which is still below the observed peak in 2017. However, sublegal catch per trap remains above pre-2011 levels.

SHELL DISEASE

Standard Error represented by thin vertical bars. Figure includes trip data from May to November, 2001-2023.

Figure 2. Shell disease prevalence (% of all lobsters measured) for all zones combined (2001-2023).

- Overall, proportion of shell disease remains low (<2%) compared with Southern New England rates (20-30%).
- Shell disease continues to be observed primarily on eggbearing females of all sizes and oversized lobsters. This pattern is consistent with the general observation that most diseased lobsters have older shells.
- Historically, the months of May and June observe some of the highest rate of shell disease in Maine. The data presented for year 2020 are not comparable to data from other years, as sampling during this time was limited due to the global COVID-19 pandemic.

Figure 3. (below) Shell disease prevalence (% of all lobsters measured) by lobster management fishing zone (2001-2023).
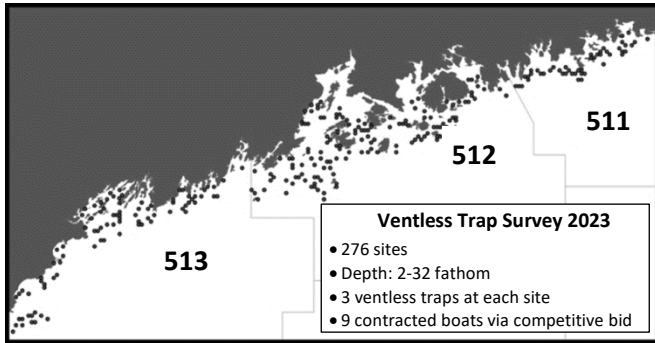
- Shell disease continues to be more common in western zones (E-G), whereas prevalence remained low in eastern ME (zones A-C).

Lobster at-Sea Sampling: Shell Disease by Zone
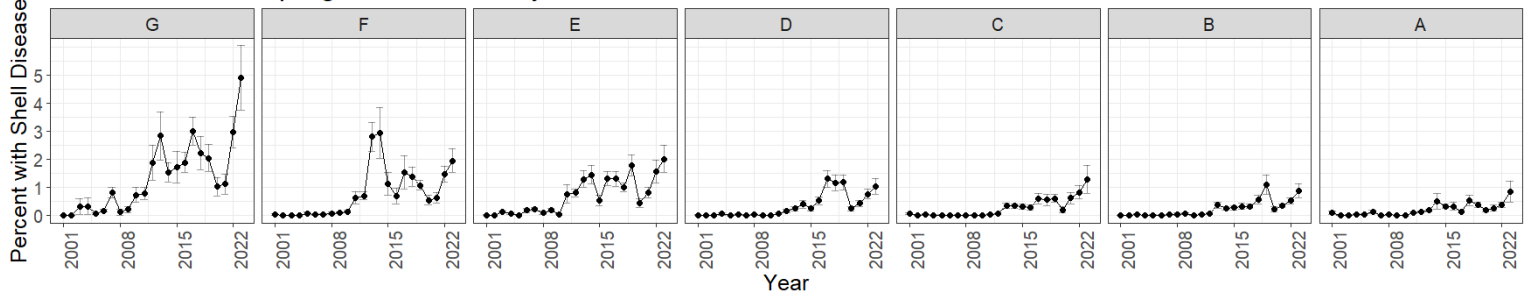
Standard Error represented by thin vertical bars. Figure includes trip data from May to November, 2001-2023.

VENTLESS TRAP SURVEY

The Ventless Trap Survey deploys traps with 1" mesh and no vents in order to monitor sublegal lobsters as an indicator of the future abundance of legal lobsters. Sites are randomly selected and stratified by depth and statistical area.
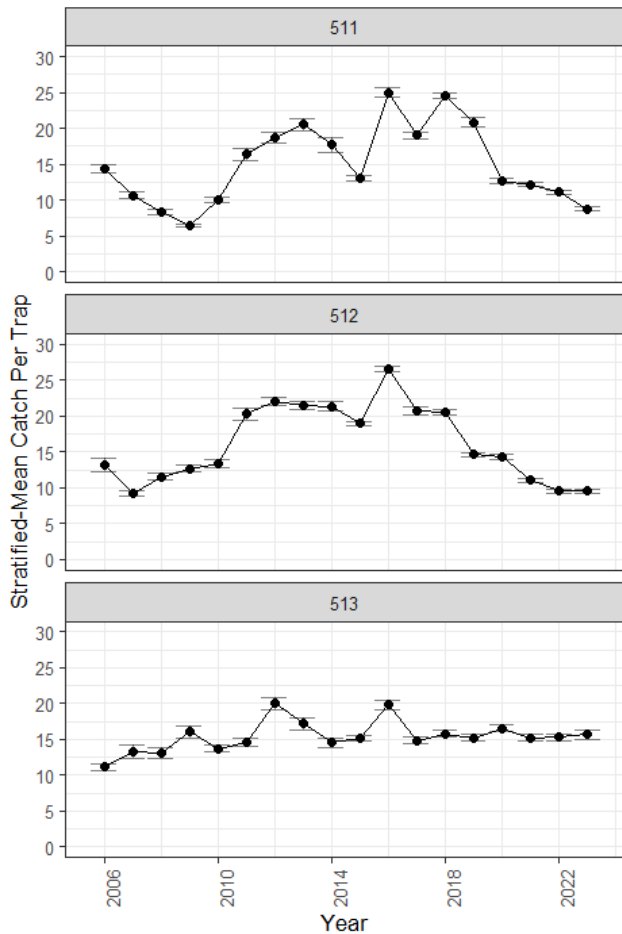

Figure 4. Ventless Trap Survey mean sublegal (<83mm CL) catch per trap stratified by depth by statistical area for 2006-2023.

- In recent years, catch-per-trap of sublegals has been on a declining trend in eastern and midcoast Maine, whereas western Maine appears more stable.
- 2023 Sublegal catch observed a continued decline in eastern Maine; however, levels in central and western Maine observed similar catch to that of 2022.

LARVAL SURVEY
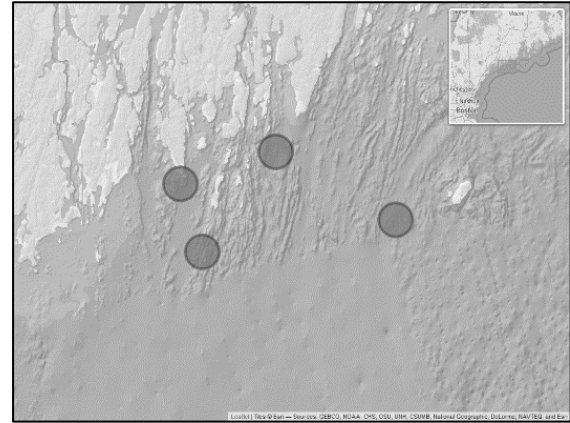
The Larval Lobster Survey is conducted from June – September at four sites in midcoast Maine, seen in the map above. Three neuston net tows are conducted at each site to sample larvae (Stage I, II, III, and IV/Post-larvae).
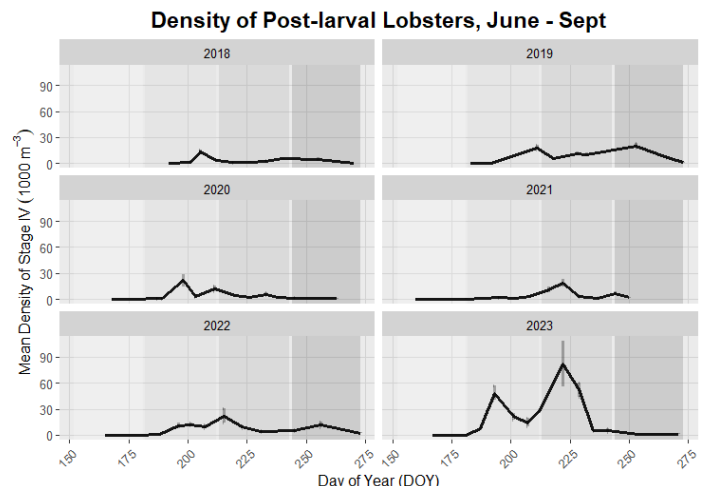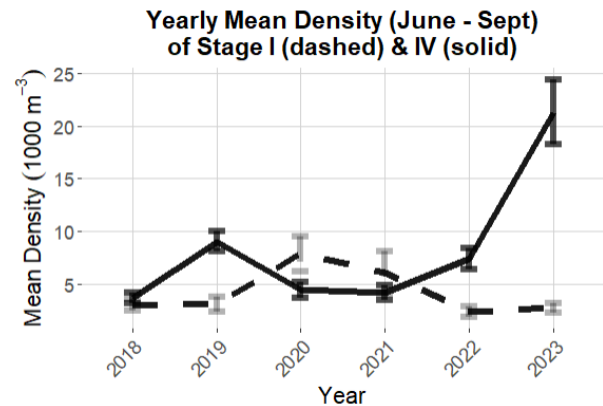

Figure 5. Larval Lobster Survey results: Top, annual trends from 2018 – 2023; Bottom, seasonal trends for post-larval lobsters from 2018 (top left) to 2023 (bottom right).

- We continue to commonly see two 'pulses', or peaks, of post-larval lobsters throughout the sampling season.
- The average post-larval density in 2023 was significantly higher than past years, particularly due to some net tows sampling high density patches.
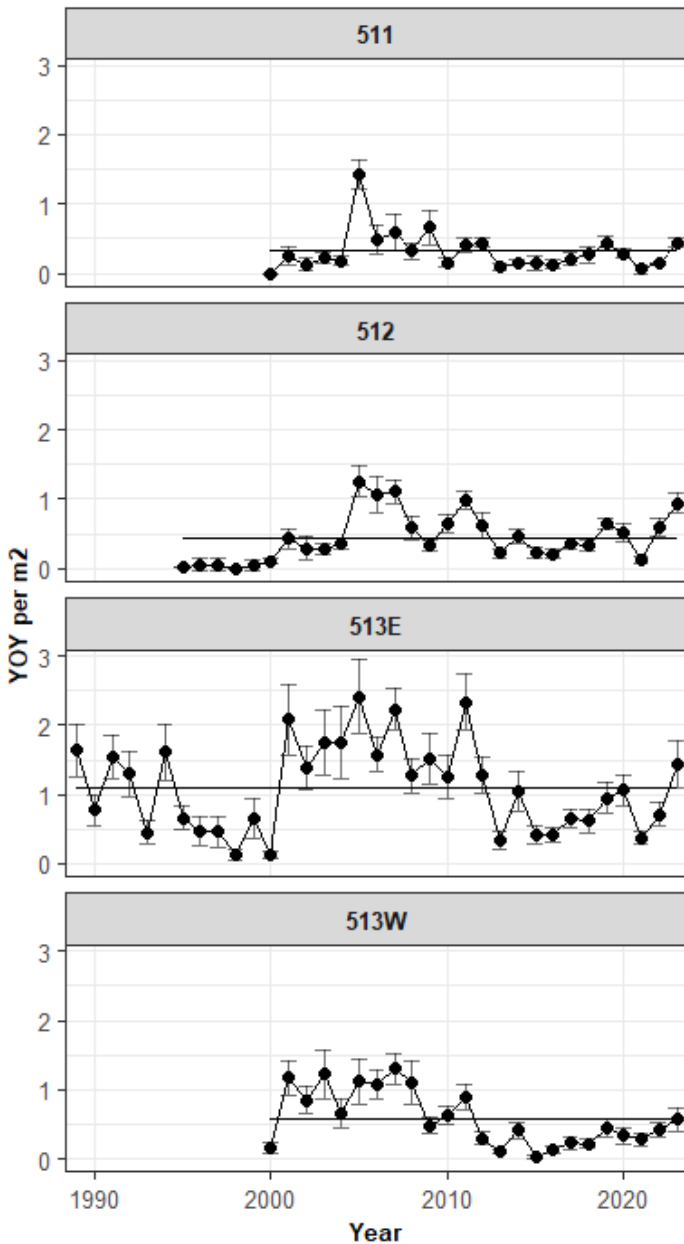
SETTLEMENT SURVEY

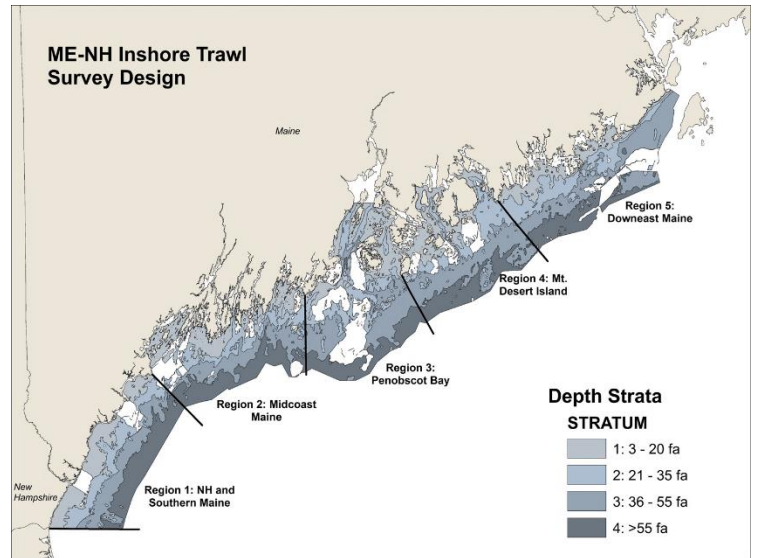

MENH Inshore Trawl Survey

Figure 6. Settlement Survey Indices by statistical area (1989-2023) with time series median.

- The settlement index is derived from a SCUBA diving survey which uses suction sampling methods to collect newly settled young-of-year (YOY) lobsters (average # YOY/m^2) in cobble habitat < 5 fathom depth.
- All regions observed an increase in YOY lobsters from 2022 numbers, but numbers have had sustained low numbers since 2012.
- The Settlement Survey does not account for changes in suitable habitat for lobster settlement, which could be occurring in deeper water.

The Maine-New Hampshire Inshore Trawl Survey is a resource assessment survey performed along the coastal waters of Maine and New Hampshire. Bi-annual surveys, spring and fall, have been conducted since the fall of 2000. This survey is a collaborative research project using a commercial fishing vessel as the platform.

Figure 7. Spring (top) and Fall (bottom) Inshore Trawl Survey
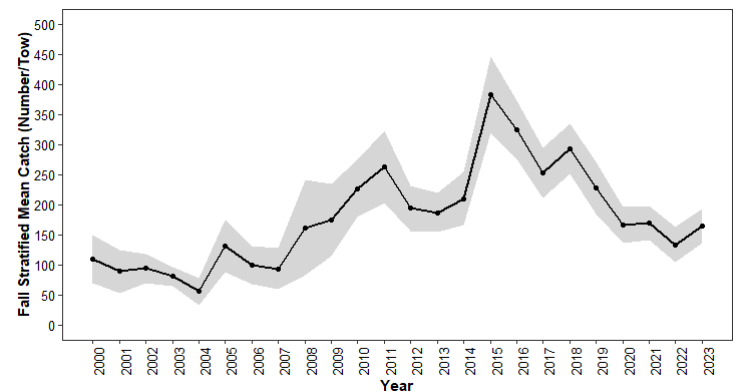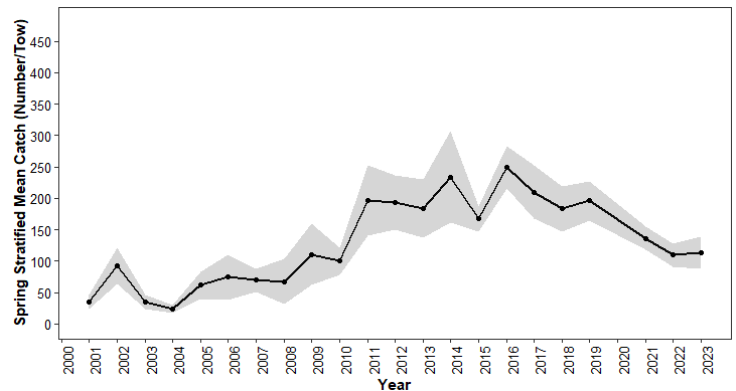
stratified mean catch of lobsters per tow.

- The spring and fall surveys continue to show a general declining trend following 2016.

2023 SURVEYS SUMMARY

➢ The Commercial Sea Sampling Program, Ventless Trap Survey, Lobster Settlement Survey, and both the spring and fall MENH Inshore Trawl Surveys were completed in full in 2023.

➢ Observed trends in numbers of sublegal lobsters have been declining in eastern regions while western areas have been more stable. There is agreement in all three surveys that track sublegal trends including Sea Sampling, Ventless Trap Survey, and Inshore Trawl Survey

➢ The Larval Survey saw a substantial increase over past years, with some extremely high sampling days attributed to uncharacteristic oceanographic conditions in 2023.

➢ The Settlement Survey saw an overall increase from 2022, but settlement levels have been at sustained low numbers since 2012.

➢ From 2023 survey results, lobster abundance appears to be continuing a slow decline across the state. Field work in the coming year will help to form a more complete analysis of the trends observed here.

➢ Some of these surveys do not currently account for changes in suitable habitat for lobster settlement, which could be occurring in deeper water. Future expansion of these surveys may provide insights into potential shifting habitat use by lobsters.