



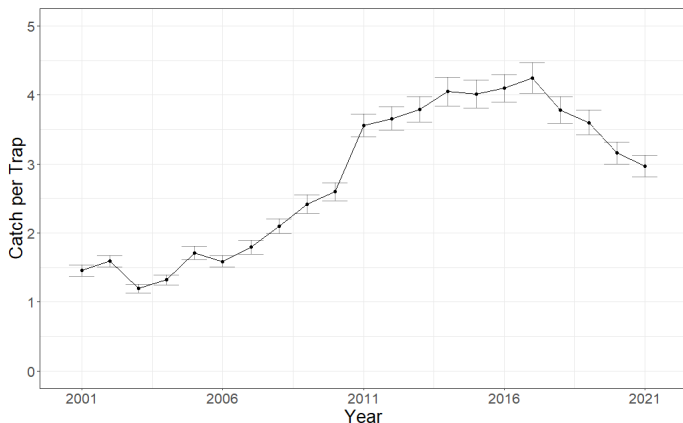
2021 Lobster Monitoring Update

Kathleen Reardon: Lead Lobster Biologist
 Matthew Davis: Sea Sampling & Ventless Trap Survey
 Robert Russell: Settlement Survey
 Rebecca Peters: MENH Inshore Trawl Survey

GENERAL SEA SAMPLING RESULTS

In 2021, the Sea Sampling Program completed its 37th season. The Sea Sampling program completed 149 trips on 140 boats from 49 different ports. We measured 183,154 lobsters from 35,813 commercial lobster traps. These data provide biological information that inform management models for the ASMFC Lobster Stock Assessment.

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.

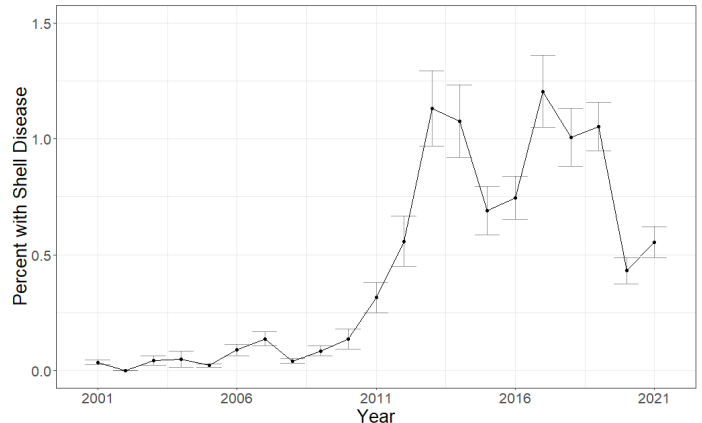


Standard Error represented by thin vertical bars. Figure includes trip data from May to November, 2001-2021.

Figure 1 (above). Sea Sampling sublegal (<83mm CL) catch per trap (total # lobsters/total traps measured) for all zones combined (2001-2021).

- In 2021, sublegal lobsters continued to decline from an observed peak in 2017. However, sublegal catch per trap remains above pre-2011 levels.

SHELL DISEASE



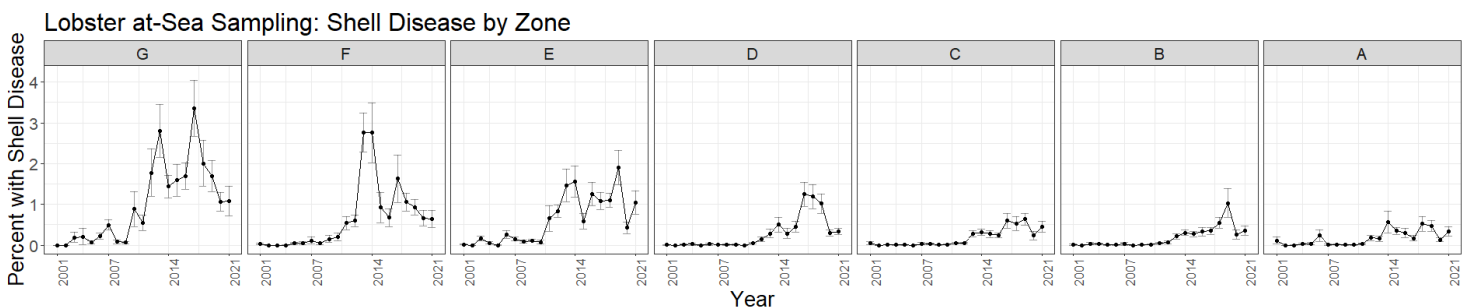
Standard Error represented by thin vertical bars. Figure includes trip data from May to November, 2001-2021.

Figure 2. Shell disease prevalence (% of all lobsters measured) for all zones combined (2001-2021).

- 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.

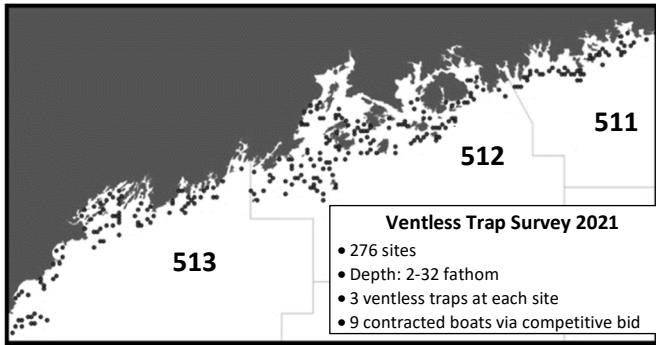
Figure 3 (below). Shell disease prevalence (% of all lobsters measured) by lobster management fishing zone (2001-2021).

- Shell disease continues to be more common in western zones (E-G), whereas prevalence remained low in eastern ME (zones A-C).

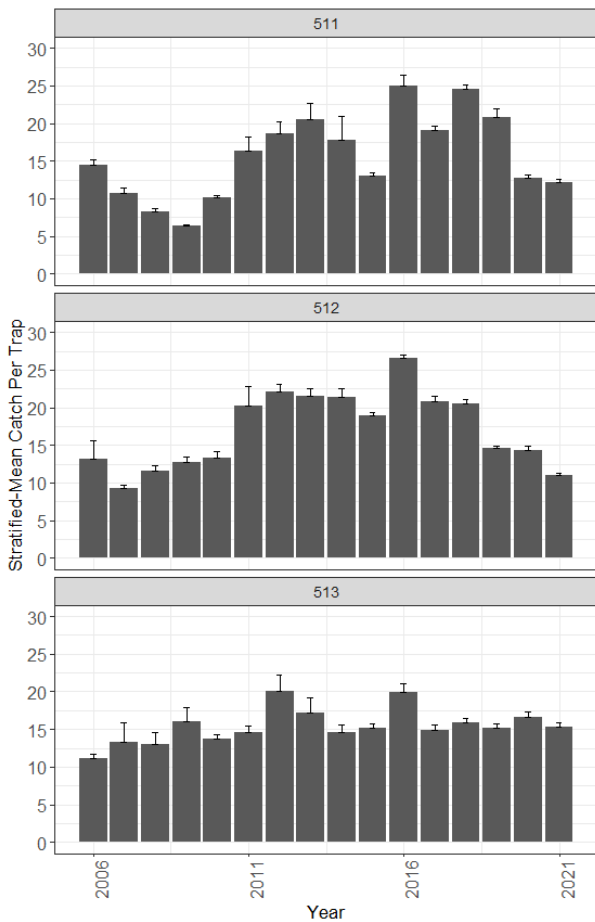


Standard Error represented by thin vertical bars. Figure includes trip data from May to November, 2001-2021.

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.

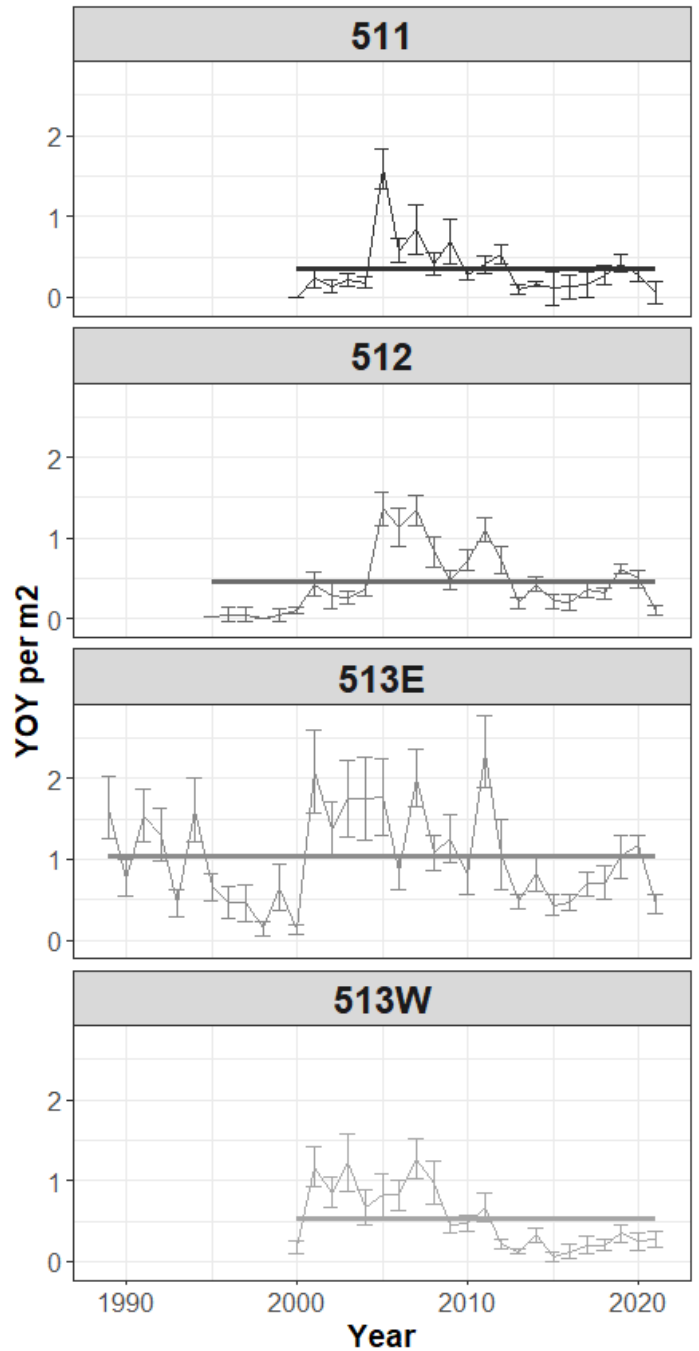


Variance represented by thin vertical bars. Traps standardized to 40 x 21 x 16 inches.

Figure 4. Ventless Trap Survey mean sublegal (<83mm CL) catch per trap stratified by depth by statistical area for 2006-2021.

- In recent years, catch-per-trap of sublegals has been on a declining trend in eastern and midcoast Maine, whereas the western region appears more stable.
- 2021 Sublegal catch observed a decline in midcoast Maine; however, levels in eastern and western areas observed similar catch to that of 2020.

SETTLEMENT SURVEY

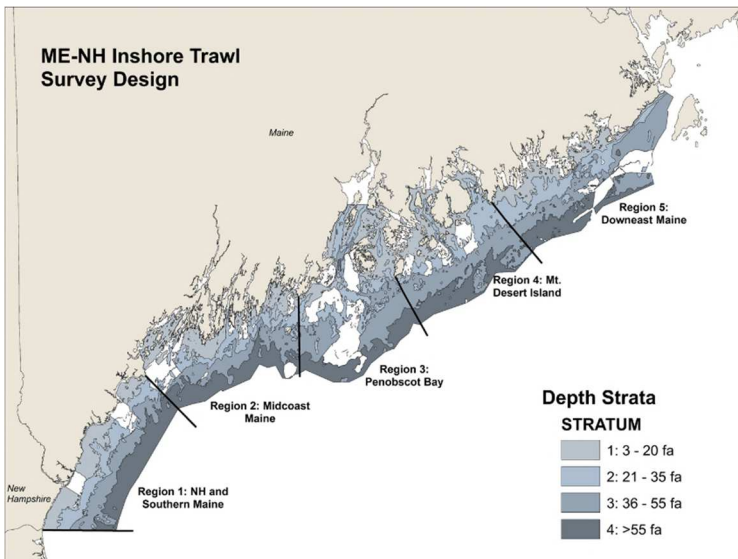


Standard Error represented by thin vertical bars.

Figure 5. Settlement Survey Indices by statistical area (1989-2021) with time series medians (solid horizontal line).

- 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/m²) in cobble habitat < 5 fathom depth.
- All regions observed decrease in YOY lobsters except for 513 West, which remained steady.
- The Settlement Survey does not account for changes in suitable habitat for lobster settlement, which could be occurring in deeper water.

MENH Inshore Trawl Survey



The Maine-New Hampshire Inshore Trawl Survey is a multi species 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.

Spring sampling was performed between May 3rd and June 4th. The fall survey took place from September 27th to October 29th in 2021.

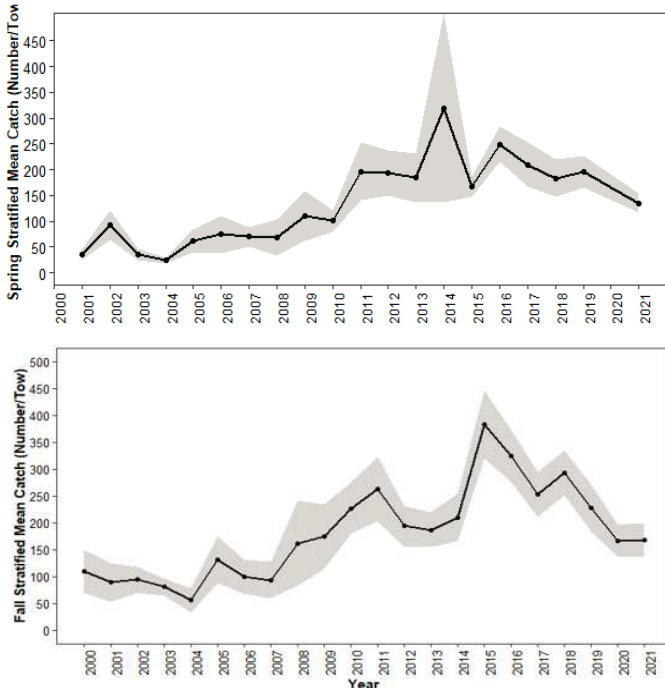


Figure 6. Maine-New Hampshire Inshore Trawl Survey Spring (top) and Fall (bottom) stratified mean catch of lobsters per tow (Fall 2000-2021).

- The spring survey peaked in 2014 and has continued to show a general declining trend since 2016.

- Since the inception of the survey, analysis of fall trawl survey data shows peaks in in 2011, 2015 and 2018. Results from 2021 were similar to 2020.

2021 MONITORING SUMMARY

- Complications surrounding the global pandemic limited the Lobster Sea Sampling program to May-December in 2021. However, Ventless Trap Survey, Lobster Settlement Survey, and both the spring and fall MENH Inshore Trawl Surveys were completed in full.
- Despite the observed declines in Sea Sampling lobsters-per-trap, overall sublegal catch remains above 2010 numbers.
- Results from the 2021 Ventless Trap Survey displayed an overall declining trend in sublegal catch over the last number of years, especially in eastern and midcoast areas.
- The Settlement Survey continued observing low levels in 2021, with some of the lowest settlement numbers in the time series in eastern and midcoast areas.
- The MENH Inshore Trawl Survey has observed declining trends in total lobster-per-tow in both the spring and fall surveys for at least five years.
- From 2021 survey results, sublegal lobster abundance appears to be continuing a slow decline across the state. Despite differences in depth covered by surveys, there is agreement between Ventless Trap Survey, Inshore Trawl Survey, and Sea Sampling. Field operations in the coming year will help to form a more complete analysis of the trends observed here.
- These survey results may be observing changes in the lobster abundance partially due to shifts in distribution of lobsters across habitats and depth. Future expansion of our current surveys may provide expanded insights into potential shifting habitat use by lobsters.