

**Ventless Trap Survey
2008 Report to Maine Department of Marine Resources
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Overview

The Gulf of Maine Lobster Foundation (GOMLF) continued the Ventless Trap Survey for its ninth successful year in 2008, with funding from Maine's Lobster Advisory Council (LAC). The Ventless Trap Survey (VenTS) is a trap-based, fishery-independent sampling program conducted by lobstermen to monitor the abundance and size structure of juvenile lobsters year-round in the Gulf of Maine. Continued participation by lobstermen is important in order to determine if the abundance of sublegal lobsters in various locations are increasing or decreasing over time.

Data collected through a Canadian counterpart of VenTS has been used to derive fishing exploitation rates in Canada and in Canadian lobster stock assessments. We believe VenTS could be used to assist in developing indices of recruitment for use in predicting fishery landings, and as a data input into US lobster assessment models to improve stock assessment.

2008 Update

In 2008, only 14 fishermen participated in the project, of whom 13 are from Maine. These fishermen are spread throughout Maine in all seven lobster management zones, with 1 in Zone A, 3 in Zone B, 2 in Zone C, 3 in Zone D, 1 in Zone E, 6 in Zone F, and 5 in Zone G. In addition, groups of students have been participating under the guidance of an instructor/lobsterman at the Southern Maine Community College.

The main reason for the reduction in Maine participants from 20 to 13, is the recent requirement for participants to obtain a Coast Guard certification. This was considered by some as too onerous a requirement, and we lost seven Maine volunteers, three of whom had been long-term participants.

We have 1 active participant in Massachusetts who fishes in Cape Cod Bay. Massachusetts participants use the same survey protocol as in Maine, so that all data will be comparable. The GOMLF is committed to working with industry to increase participation in the project.

All the 2008 data have been entered into a relational database. Just under 6,000 lobsters were caught in 2008. We plan to send out reports to each participant before summer 2009.

US/Canada Collaboration

The GOMLF and Fishermen and Scientists Research Society (FSRS) continue to collaborate on this bi-national US-Canada lobster recruitment project. The GOMLF and FSRS communicate through conference calls to set the protocol for data collection, trap design and data management. The GOMLF remains on the FSRS' data management committee to assist with this endeavor.

In February 2009, GOMLF brought 8 ventless trap participants and three scientists to the FSRS/GOMLF Lobster Science Workshop and FSRS Annual Meeting in Nova Scotia. This was an opportunity for lobstermen from both sides of the border to compare notes and to build camaraderie among the VenTS participants. GOMLF Data Specialist, Sara Ellis, presented an update on VenTS and showed the first direct comparison of results of the two studies.

Communications

In addition to the joint meeting noted above, GOMLF has been sharing information about this project in several other venues. In Sept 2007, we gave a presentation at the *8th International Conference and Workshop on Lobster Biology & Management* which was held in Charlottetown, PEI Canada. We give annual updates via dispalys at the *Maine Fishermen's Forum*. We also participated in the February 2009 external review of Maine DMR's lobster monitoring programs.

Results

To date, 66 lobstermen and multiple students from a community college have participated directly in VenTS contributing more than 8,600 trap hauls. Nearly 76,000 lobsters have been captured and measured, of which more than 68,082 were sublegal and 32 were oversized lobsters. Over the study period, most lobsters (46,134) have been caught in the lobstermen's ventless traps, compared with 21,233 caught in the standardized ventless traps, as the latter were not introduced until 2004. Only 8,364 lobsters were caught in control traps.

Table 1. Level of participation, effort and catch in VenTS, 2000-2008.

Year	# Participants	# Trap Hauls	# Lobsters
2000	34	1,760	19,398
2001	11	739	6,062
2002	7	196	1,845
2003	7	283	2,635
2004	25	1,361	11,534
2005	18	1,113	8,624
2006	20	1,239	10,634
2007	22	1,213	9,064
2008	15	740	5,935
Total	67 individuals	8,644	75,731

Both the standardized ventless traps and individual's ventless traps are effective at capturing and retaining juvenile lobsters. The mean sub-legal component of the catch in control traps was 1.5 lobsters/trap compared with 10.2 in standardized ventless traps and 13.1 in ventless traps. Catch per trap haul (CPTH) of legal size lobsters shows the inverse relationship, with control traps catching on average 0.96 lobsters/trap and standardized traps only 0.56 legal lobsters/trap.

The two 10-mm size classes most highly represented in the both types of ventless traps are sizes 7 and 8/9, which correspond to lobsters with a maximum carapace length of 70 and 80 mm respectively. These are considered pre-recruits because within 1-3 molts these lobsters are expected to reach minimum legal size (82.5 mm CL).

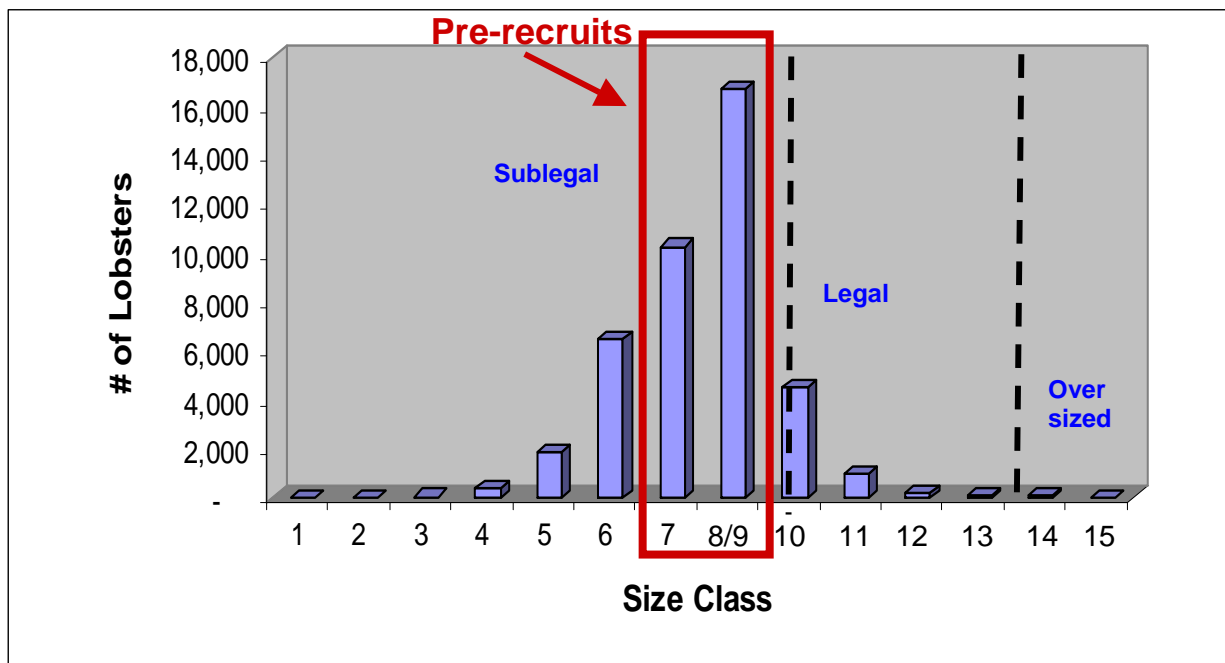


Figure 1. Relative numbers of lobsters caught in Ventless and Standardized Ventless traps by 10-mm size classes, as measured with the new gauge introduced in 2004 (n = 41,734 lobsters).

Inter-annual trends in sublegal catch, All Maine

Data from both types of ventless traps were used to look at the catch rates of sublegal lobsters by year. Exploratory analyses revealed that one particular lobsterman, who uses a larger ventless trap than other participants and consistently catches a higher number of sublegal lobsters than others, was biasing the Maine data. Between 2000 and 2006, trends in sublegal CPTH including, and excluding, this individual follow the same pattern (Figure 2). However he did not participate in 2007, and his return to the program in 2008 skewed the 2008 annual CPTH upward in both Ventless and

Standardized Ventless traps (Figure 2). Thus this individual's data were excluded from all further analyses.

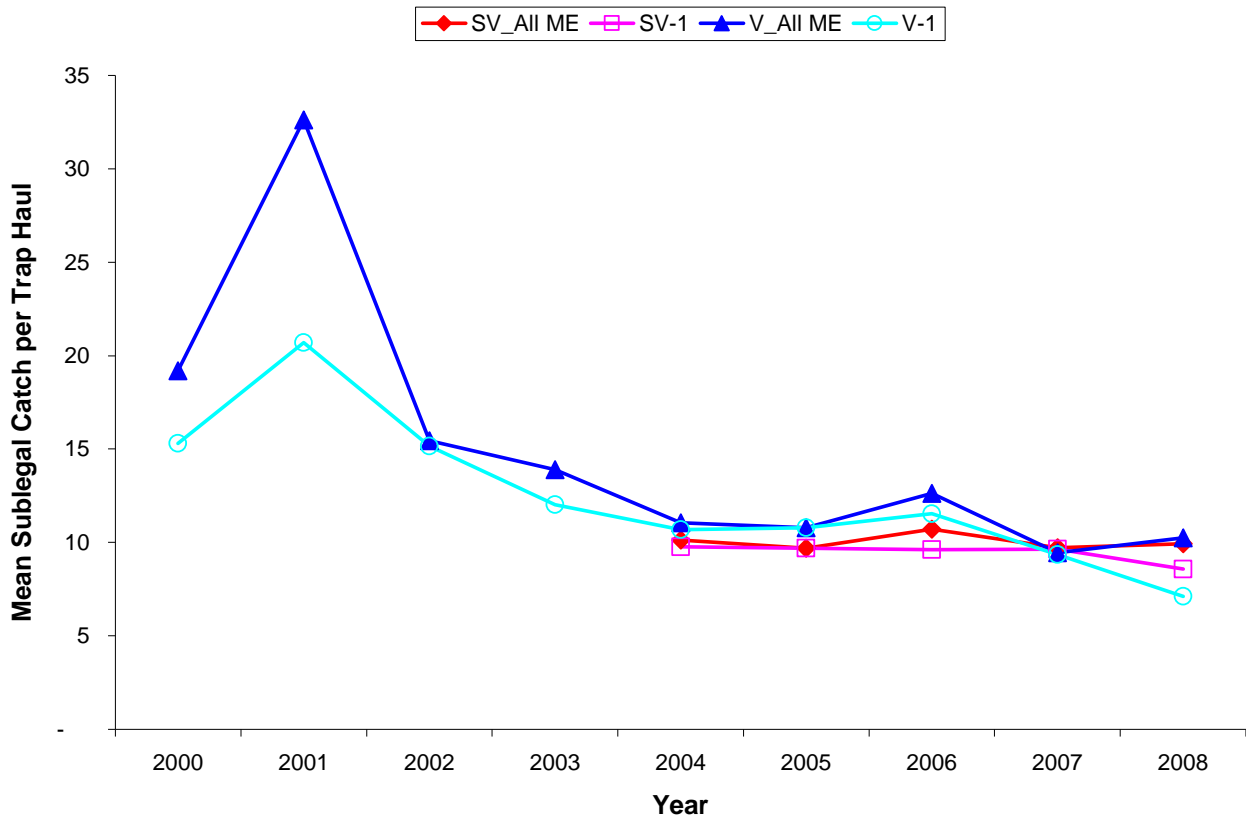


Figure 2. Mean annual sublegal catch per trap haul in Maine, in Ventless (V) and Standardized Ventless (SV) traps, averaged for all Maine participants (All_ME) and all Maine participants except for one (-1).

This was the third year in which we had sufficient data to compare inter-annual trends sublegal catch rates in Ventless and Standardized Ventless traps. The 5-year time series from 2004-2008 shows that the two types of traps track the same trends quite well in terms of sublegal lobsters (Figure 3). On average throughout Maine there has been a fairly steady decline in sublegal CPTH since 2001. The slight upswing noted in 2006 has not continued.

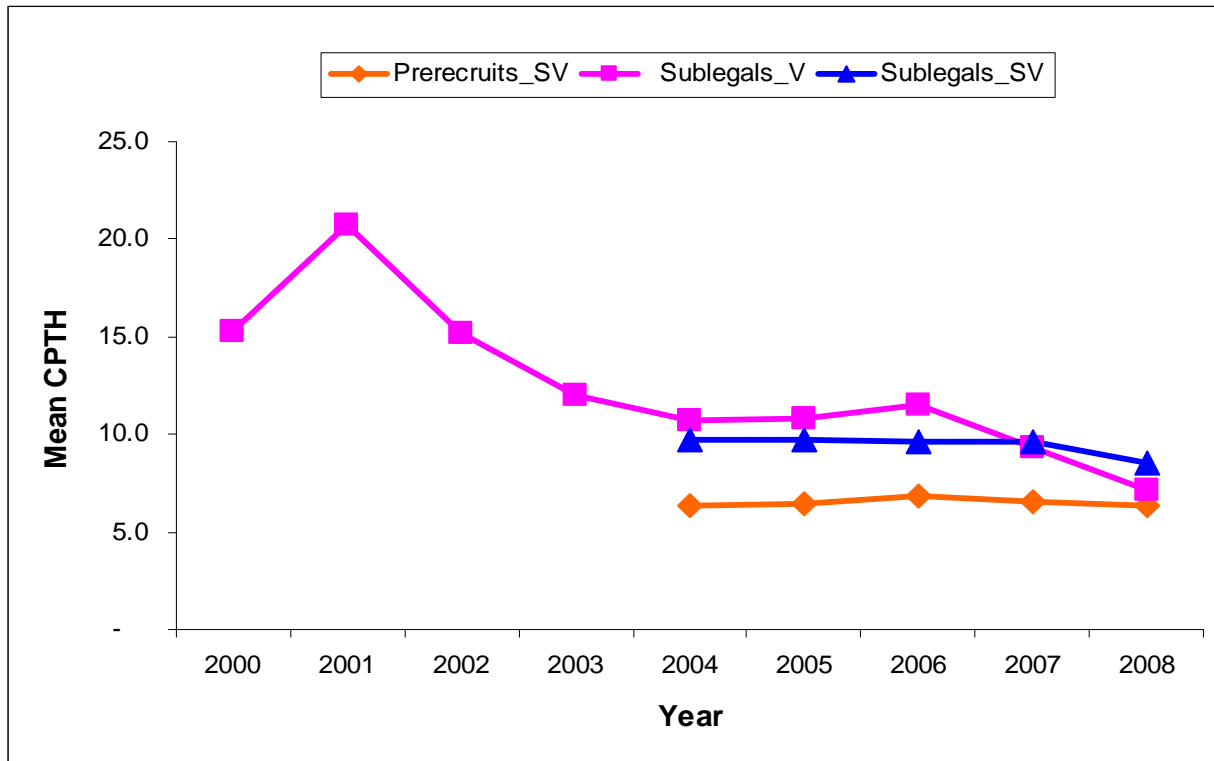


Figure 3. Inter-annual trend in catch per trap haul of sublegal and pre-recruit lobsters in Ventless (V) and Standardized Ventless (SV) traps, 2000-2008, Maine only (n = 59,729 lobsters and 7,262 trap hauls).

This is the first year we looked specifically at the time series of catch rates for pre-recruits (61-80mm CL) in standardized ventless traps. Currently, this group can only be analyzed back to 2004, after the introduction of the new gauge. As expected the average pre-recruit CPTH is lower than that of sublegals, since pre-recruits are a subset of the larger group. However both groups show similar inter-annual trends in CPTH. This indicates that analyzing longer-term trends in sublegal lobster catch is a good proxy for trends in pre-recruits.

Trends by lobster management zone and fisheries statistical areas

We recognize that participation was not consistent between Maine lobster management zones over the study period, however it is still possible to examine trends in juvenile abundance within and between zones, as long as we keep this caveat in mind. All zones exhibit lower catch rates of sublegal lobsters in 2008 than most previous years, except for zones B and C (Figure 4).

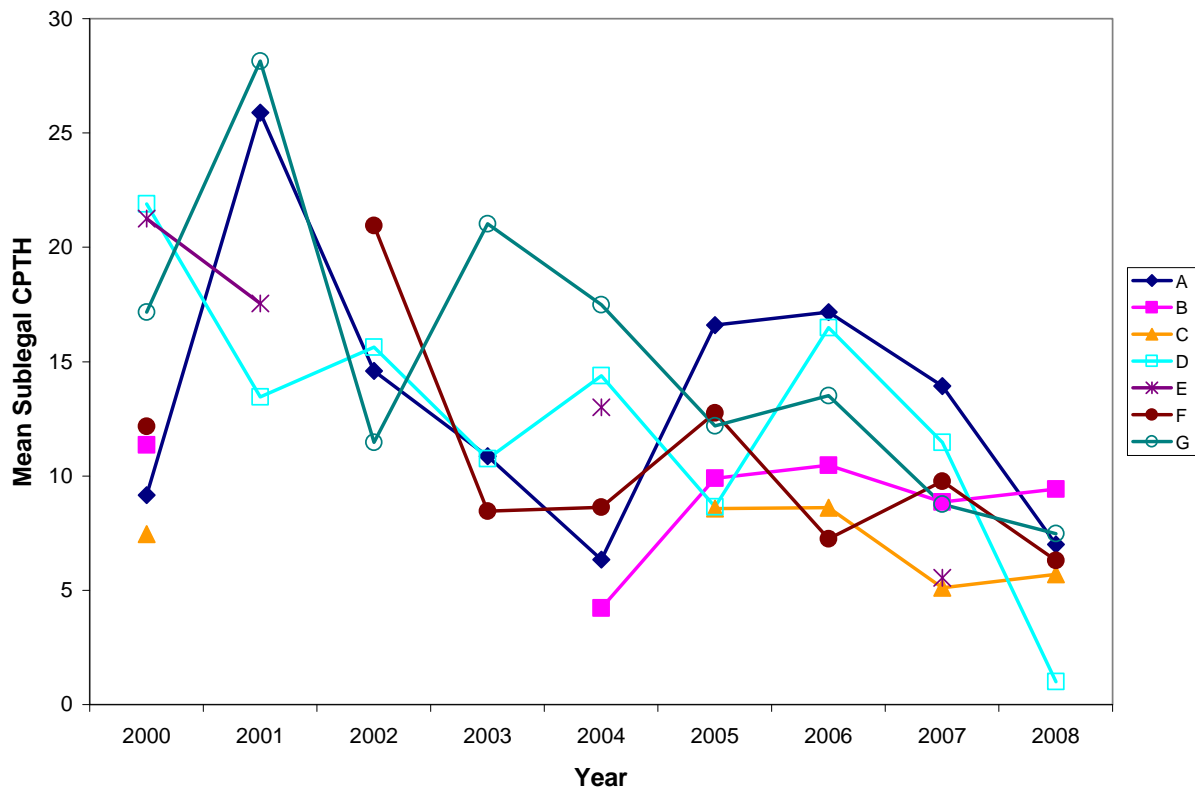


Figure 4. Mean annual CPTH of sublegal lobsters in Ventless traps, in Maine, by lobster management zone (n = 32,029 lobsters).

By grouping Maine data together according to statistical fisheries management areas (where statistical area 511 includes Zone A, 512 includes zones B, C, & D, and 513 includes zones E, F, and G; Figure 5), we were able to look for regional trends on a larger scale that is less affected by uneven participation. In previous reports to DMR, we noted the increase over time of catch of sublegal lobsters Down East from 2004 - 2006, along with a concurrent decline in southern Maine (Figure 6). We are now seeing a decline in sublegal catch in all 3 statistical areas since 2006 (Figure 6).

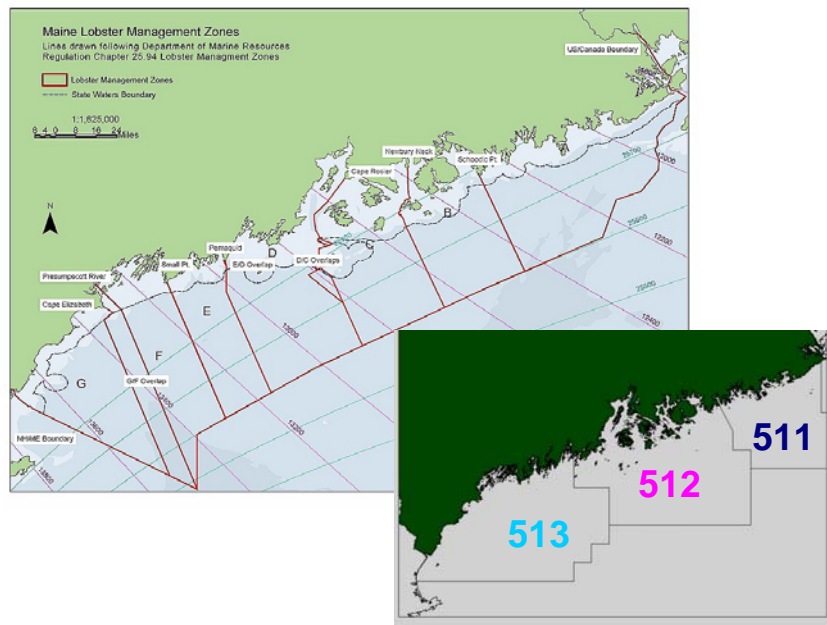


Figure 5. Maine Lobster Management zones and federal fisheries statistical areas.

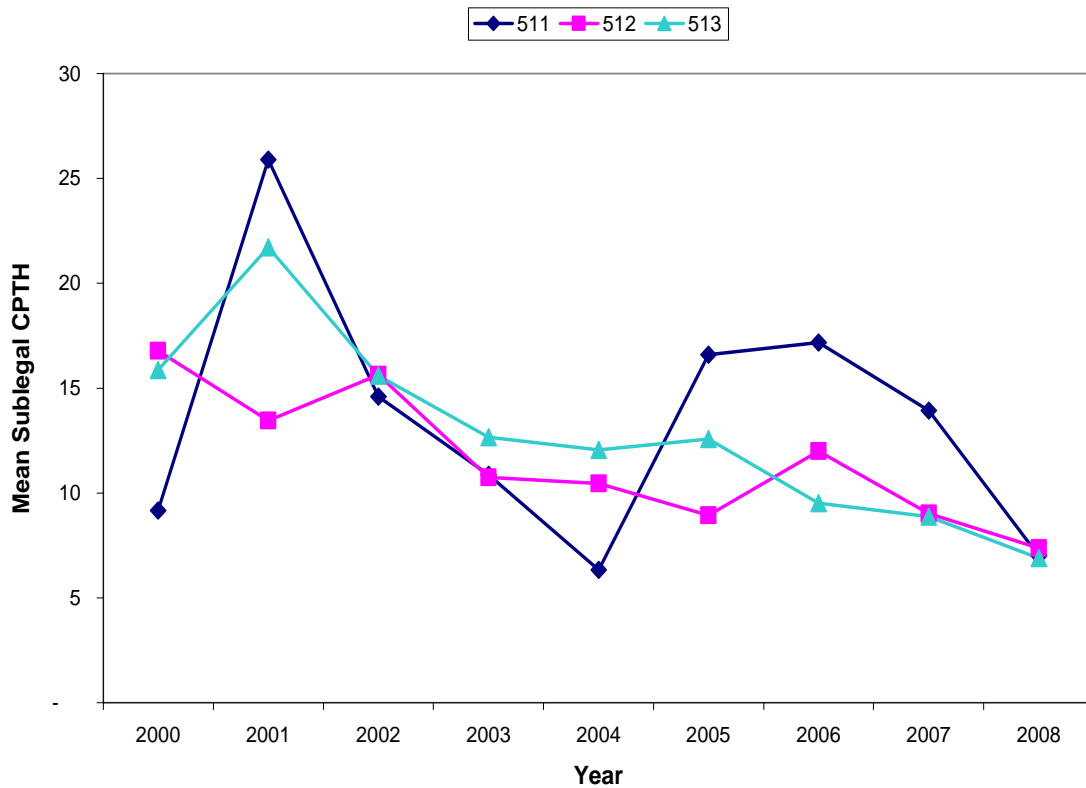


Figure 6. Inter-annual trend in catch of Sublegal lobsters in Ventless traps, in Maine, by federal fisheries statistical area (n = 40,291 lobsters). Area 511 is Down East (Zone A), 512 Midcoast (zones B-D), and 513 is southern Maine (zones E-G).

Bi-national program comparison

One of our goals this year was to begin comparing data from VentTS with other ventless trap programs, starting with the FSRS lobster recruitment project. In the Canadian Maritimes there are many Lobster Fishing Areas (LFA) (Figure 6). We chose to compare our data with data from LFA 34, at the tip of southwest Nova Scotia, since this area is within the Gulf of Maine and FSRS has many ventless participants there.

The lobster season in LFA 34 is closed from June through October, in contrast with Maine where, although there is no closed season, effort and catch increases in late summer after the main molt (Figure 7).

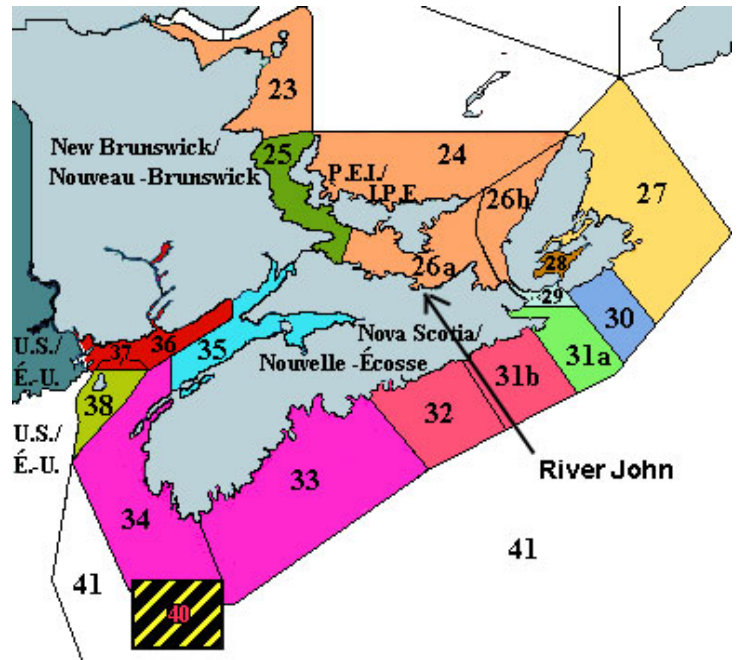
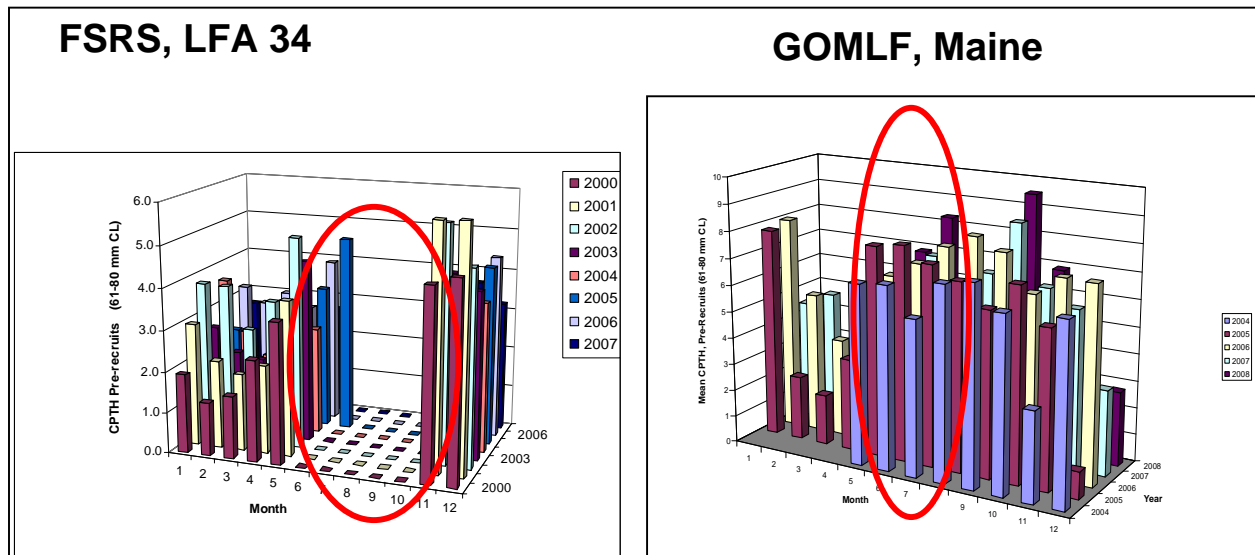


Figure 6. Lobster Fishing Areas in the Canadian Maritimes.



Closed season
Opens November
High catch Nov, Dec

No Closed season
Catch ramps up June,

Figure 7. Comparison of monthly sublegal catch by year in Canadian and US lobster recruitment studies in LFA 34 and Maine

In order to make a meaningful comparison between the two studies, we calculated mean monthly average CPTH of pre-recruits for the first two months of the fishing season in LFA 34 (Nov and Dec) and for June and July in Maine. Although mean CPTH was higher in Maine than in LFA 34, the two studies showed remarkably similar trends from 2004 to 2007. The 2008 data is not yet available for LFA 34, but based on the comparison of Dec in LFA 34 and July in Maine, we predict that in LFA 34, pre-recruit catch rate will be lower in Dec 2008 than in Dec 2007.

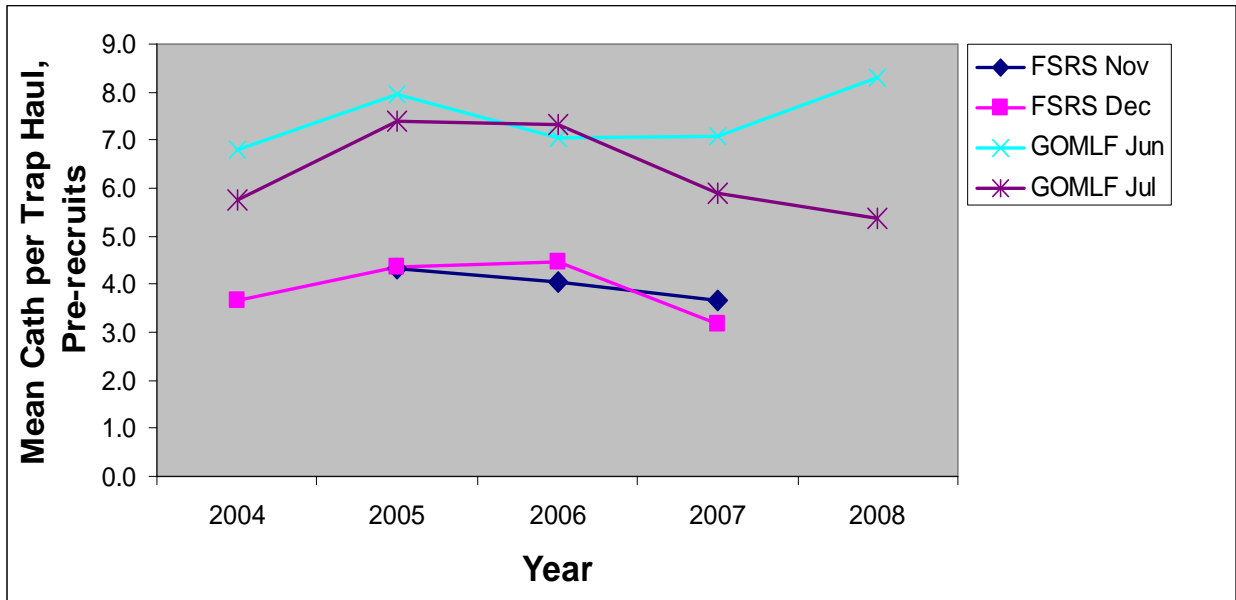


Figure 8. Comparison of FSRS and GOMLF interannual trends in pre-recruit catch. Mean monthly CPTH of pre-recruits for the first two months of the fishing season in LFA 34 versus that for June and July in Maine, by year.

To make a longer-term comparison, we focused in further on the months of Dec and July for FSRS and GOMLF, respectively, and compared these with the GOMLF July sublegal catch in Maine, which goes back to 2000. Again, although the pre-recruit catch in LFA 34 was lower than the sublegal and pre-recruit catch in Maine, the patterns were quite similar (Figure 9). Most notably, in LFA 34 and in Maine, 2001, 2005 and 2006 were all high years for pre-recruit and sublegal catches in the months that we focused on for each study (Figure 9).

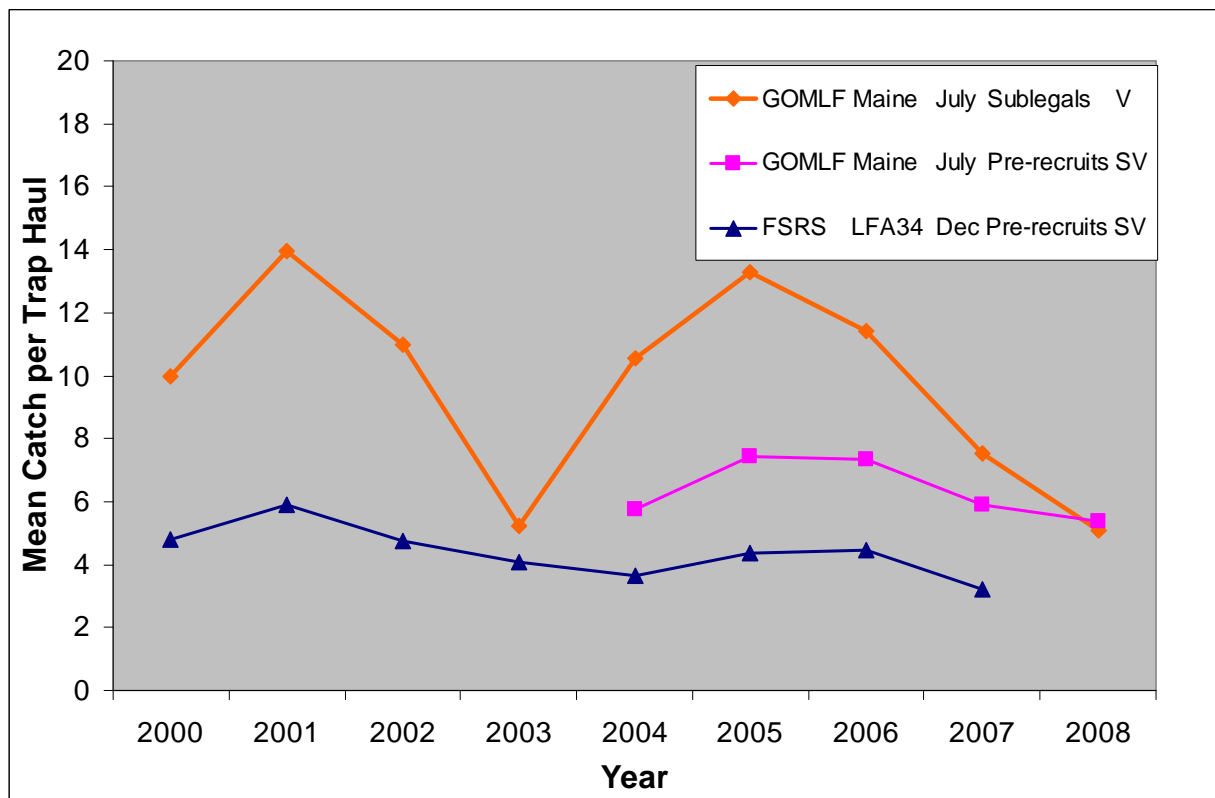


Figure 9. Comparison of FSRS and GOMLF interannual trends in monthly pre-recruit and/or sublegal catch by year (December in LFA 34 versus July in Maine).

Conclusions

In order to monitor trends in abundance, VenTS is designed as a long-term program. Our data are generally showing a decline in catch rates of sublegal and pre-recruit lobsters in most zones and statistical areas since 2001, and all zones and areas since 2006.

Our 9-year time series shows similar trends in sublegal catch as observed in our sister lobster recruitment project in Canada. This indicates that VenTS can serve well as one of several indicators to track trends in populations of pre-recruit lobsters. The use of multiple indicators has been recommended by the Atlantic States Marine Fisheries Commission for improving lobster stock assessments. We hope to expand our comparison to other studies, including Maine DMR's regional ventless trap study.

Acknowledgments

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