Commercial Port Sampling of Northern Shrimp *(Pandalus borealis)* Along the Maine Coast

Season Summary for the 2013 Shrimp Season
January 23, 2013 – April 12, 2013

By
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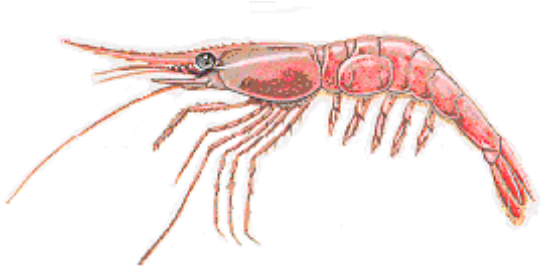

State of Maine
Department of Marine Resources
Biological Monitoring and Assessment Division

Introduction

The commercial shrimp port sampling project is conducted by the Maine Department of Marine Resources Biological Monitoring and Assessment Division headquartered at West Boothbay Harbor. Sampling of the Maine shrimp fleet occurs at roughly 27 dealer locations in approximately 18 ports from Portsmouth, N.H. (where in some years several Maine boats land their catches) to Machias, Maine.

Acknowledgements

The Department of Marine Resources (DMR) shrimp port sampling team for the 2013 season consisted of Marilyn Lash, Lisa Pinkham, Dominique Walk, Craig King, Amy Hamilton-Vailea, Brian Swan, Leticia Monahan, and David Kent.

We appreciate the excellent cooperation we have received from dealers and fishermen in obtaining shrimp samples and catch information. Because of this we have had a great deal of success in our sampling efforts.

Purpose

The purpose of this project is to furnish biological and catch/effort information about the commercial northern shrimp (*Pandalus borealis*) fishery to Department staff and the Atlantic States Marine Fisheries Commission's Northern Shrimp Technical Committee, who advise fishery managers on the status of the stock and the setting of biological and fishery goals. We do this by collecting samples from many individual fishing grounds, gathering catch and effort information through captain interviews at various fishing ports, and by completing laboratory analyses of the shrimp collected.

Sampling and Laboratory Procedures

During our boat captain interviews the following information is recorded, depending on whether the boat is a dragger or a trapper: Date, Dealer, Boat name, Catch location, Depth fished, Total hours of drag time, Number of tows, Number of traps set, Number of traps hauled, Number of days the traps have been set, Total pounds caught, Comments, Number in crew, and Captain's name. Permission is asked of the captain to take a 2 lb (~1 kg) sample from his catch back to Boothbay Harbor for laboratory analysis. Samples are purchased at $5.00 for a 2 lb sample.

For each dragger sampled, information from the interview forms is used to determine the total catch of the vessels sampled at each dealer, the total drag time, the range of catches in pounds, the average catch in pounds per boat, the average catch per unit of effort (CPUE) expressed in lbs/hr drag time for each vessel, the range of CPUE's, and the average CPUE for the vessels sampled.

From the information gathered from trappers, the total catch of the trappers sampled at each dealer, the total number of traps in the water, the total number of traps fished that day, the total soak time, the range of catches in lbs, the average catch/vessel in lbs, the range of catches in lbs/trap, and the average catch/trap/day is calculated.

The boat price for the shrimp landed on that day by both draggers and trappers is also recorded. We also maintain/update discrete lists of fishing grounds from which the samples are harvested, vessels sampled, and dealer sites utilized, so the lists can be reviewed and the sites/vessels readily selected to help lessen repeated sampling of the same body of shrimp, thus spatially broadening the sample base.

Laboratory processing of samples occurs concurrently with field sampling. In this way additional samples can be taken almost immediately if areas need follow-up. In addition, daily contact with dealers and fishermen occurs, thus assuring sampling flexibility. If necessary, different sections of the coast can be sampled at the same time, allowing data collection from different areas during a particular point of time in the season.

Shrimp are processed in the laboratory in order to generate species-, sex-, and stage-specific length frequency distributions, thus providing information on the composition of the catch from different fishing grounds.

Significance of our work

Information from the Maine commercial fishery is combined with similar information from Massachusetts and New Hampshire and with abundance indices from the summer Gulf of Maine shrimp survey for the purpose of managing the fishery. Since Maine fishermen take approximately 90% of the Northeast U.S. catch, information provided by DMR is crucially important to effective management of the species.

Commercial Shrimp Port Sampling Summary for the 54 days allowed for dragging and the 62 days allowed for trapping between January 23, 2013 – April 12, 2013.

During the 54 days allowed for dragging and the 62 days allowed for trapping during the 2013 season, 99 shrimp samples and corresponding captain interviews were obtained from 92 draggers (57 different draggers) sampled at 22 dealers from Portland to Gouldsboro and from 7 trappers (7 different trappers) sampled at 3 dealers from Southport to Friendship. The lengths of the boats sampled ranged from 31' – 71' and the samples came from 15 different fishing grounds. The breakdown for each month can be found in Table 1.

The opening of the 2013 shrimp season on Wednesday, January 23 was marked by low catch rates of nice shrimp. There was less activity than in recent years due to the poor shrimp population and a predicted short season. The price for January was about $0.50 higher than last years. In January, the average daily catch per boat was 891.73 lbs and the average per hour catch rate was 159.53 lbs/hr. At the end of January the catch rates had decreased, the shrimp appeared to be of a nice size, and majorities of the shrimp were still egged.

For February, the overall catch per boat was 722.39 lbs, down 169.34 lbs from January's average catch. The average catch rate was 96.49 lbs/hr, down 63.04 lbs/hr from January's numbers. At the end of the month it appeared that the shrimp in the western part of the state were moving off and were at 40-50 fathom depths and 31% of the catch was still egged. In the eastern part of the state the shrimp were still in 30-40 fathom depths and 85% of the catch was still egged. The draggers and trappers catches in the western part of the state had decreased.

For March, the overall catch per boat was 551.93 lbs, down 170.46 lbs from February's average catch. The average catch rate was 75.75 lbs/hr, down 20.74 lbs/hr from February's numbers. At the end of March it appeared that all of the shrimp had "dropped" their eggs and were out in 45-70 fathoms. The trappers catch had dropped off so much that they had stopped fishing and the draggers catches had not started to increase again by the end of the month.

In April the average catch per boat was 300.00 lbs, down 251.93 lbs from that of March. The average catch rate was 56.25 lbs/hr, down 19.50 lbs/hr from March's numbers.

The average daily catch for draggers by month in 2013 was the lowest in January and the lowest in February when compared to the same months from the 2011 and 2012 seasons (Figure 1). This was most likely due to the limited time the draggers could fish during the day and the poor population of shrimp. The average CPUE's for draggers by month in 2013 showed the same trend as the average daily catches. The 2013 season had the lowest CPUE in January and the lowest in February when compared to the same months from 2011 and 2012. This was most likely due to the poor population of shrimp even with days off in between fishing days allowing the shrimp to bunch up (Figure 2).

The average set over days for trappers by month in 2013 was almost equal for February when compared with the 2012 season and less when compared with the 2011

season. March saw the highest average set over days for trappers, due to the poor catches and bad weather fishermen were letting their traps set longer. (Figure 3).

When compared with the previous 9 years, the average daily catch and the CPUE by the draggers was the lowest for the 2013 season (Figure 5).

In looking at the past 10 years for trappers, the 2013 average pounds per trap were below the 10 year average with the lowest average pounds per trap. The pounds per trap hauled set over day were below the 10 year average with the lowest pounds per trap hauled set over days (Figure 6). The average daily catch for trappers in 2013 was the lowest in the past 10 years and decreased by about 472 pounds a day from the 2012 season (Figure 4). The 2012 season was the 9th highest over the last 10 years.

The average count per pound for draggers in 2013 was the 4th lowest it has been over the last 10 years (Figure 7). The count per pound for trappers in 2013 was the 5th highest it has been over the last 10 years (Figure 8). This was probably due to having the 2011, 2010, and 2009 year classes being poor or missing all together.

The samples taken from trawlers in January show (Figure 9) that the catches were clean containing almost no males. Almost no transitionals and female I (females that have not yet carried eggs) shrimp. Twenty three percent of the catch were female II (females that have carried and hatched their eggs) and seventy-three percent were ovigerous females. February the catches were even less mixy with 52% of the catch still ovigerous females, 45% female II shrimp, and less male shrimp. For March the catches were comprised of 93% female II shrimp and 4% ovigerous females. For April the catches were comprised of 88% female II shrimp and 12% of the catch was made up of males, transitionals and female I shrimp.

The trapper catches for February showed (Figure 9) a majority of female II shrimp (66%) and a minority of ovigerous females (34%). The trapper catches for March showed a majority of female II shrimp (96%) and a minority of ovigerous females (4%).

The price being paid for January ranged from $1.45 to $1.65 per pound with the average being $1.50 per pound. For February the price paid was $1.54 to $2.25 per pound with most going for around $1.88 per pound. For March the price paid was $1.85 to $2.10 per pound with most going for around $1.98 per pound.

January 2013 comments that were expressed:

Comments heard during the opening week: The only comment heard during opening week was that “Scientist’s might have been right; they might have even overestimated how many shrimp there are.”

Comments heard during the second week: The only comment was by a fisherman that stated “Got the net caught in the mud, which is why we don’t have many shrimp”.

February 2013 comments that were expressed:

Comments heard during the fourth week: Many fishermen commented this week on how slow the fishing was.

March 2013 comments that were expressed:

Comments heard during the eighth week: One fisherman this week stated that this was his last day shrimping and he would be switching back to lobster fishing.

Table 1 The following is listed for each month from January, 2013 - April, 2013: *1)* the number of dealers visited and their locations, *2)* number of samples collected, *3)* number of different draggers sampled, *4)* number of different trappers sampled, *5)* length range of the boats sampled, *6)* number of fishing grounds that the samples came from *7)* total catch in lbs for draggers, *8)* total catch in lbs for trappers, *9)* number of dragger boat days, *10)* draggers average catch/day in lbs, *11)* total hours drag time, *12)* lbs/hr drag time, *13)* total number of traps hauled, *14)* total set over days, *15)* average lbs/trap and *16)* average lbs/trap/day. The table also includes totals for each of these indices.

Commercial Shrimp Port Sampling January 23 - April 12 2013 Season

	Dealers Visited & Locations [1]	Samples Collected	Boats: Draggers Sampled [2]	Boats: Trappers Sampled [2]	Boats: Length Range (ft)	Fishing Grounds	Total catch in (lbs): Draggers	Total catch in (lbs): Trappers	Boat Days	Draggers Av. Catch Per Day (lbs)	Total Hrs. Drag Time	lbs./Hr Drag Time	Total Traps Hauled	Total Set Over Days	Average lbs./trap	Average lbs/trap haul set over day
Jan. 2013	9 Portland, ME to Stonington, ME	26	26	0	33'-71'	8	23,185	0	26	891.73	145.33	159.53	0	0	0	0
Feb. 2013	20 Portland, ME to Gouldsboro, ME	53	49	4	31'-63'	11	35,397	1,009	53	722.39	366.84	96.49	395	9.00	2.55	1.15
Mar.[3] 2013	9 Cundys Harbor, ME to Stonington, ME	20	17	3	32'-63'	8	8,627	194	20	658.70	118.00	73.11	118	35.00	1.64	0.13
Season Totals:	24 Portland, ME to Gouldsboro, ME different dealers	99	92 57 different draggers	7 7 different trappers	31'-71'	15 different fishing grounds	67,209	1,203	99	724.55	630.17	106.65	513	44.00	2.35	0.50

1 Dealers visited more than one time in any given month are only counted once.
Sampling is also conducted at the Portsmouth, N.H. Fishermen's Co-op due to the fact that some Maine shrimp boats land their catches at that facility.
2 Some vessels may be sampled more than once in a given month. Hence the number of samples collected may exceed the number of different vessels sampled.
3 March totals include two April trips where three boats were sampled.

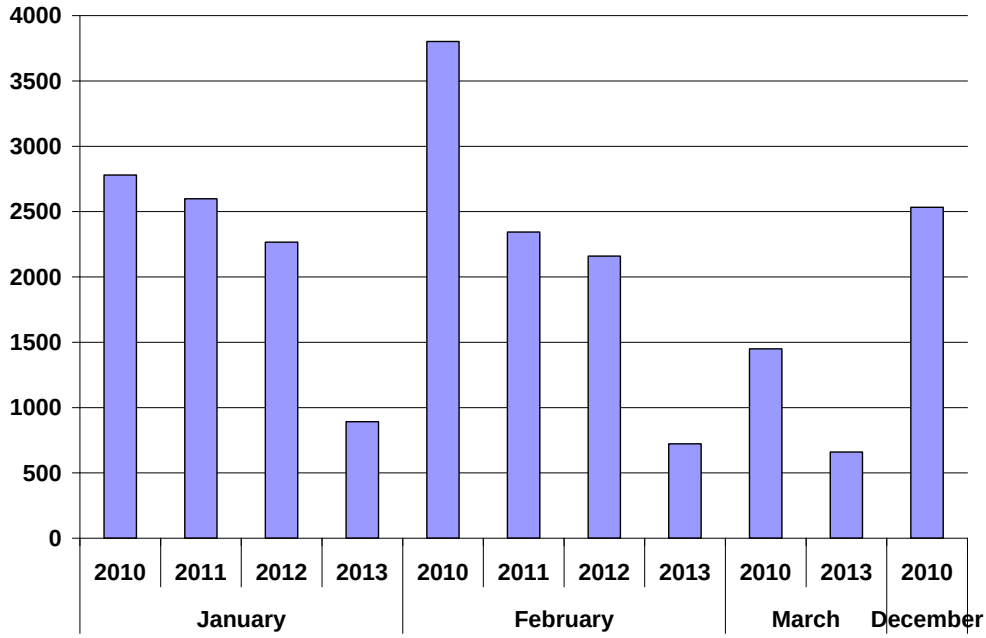

Figure 1 Average daily catches by month for draggers that were sampled during the 2011, 2012, and 2013 seasons.

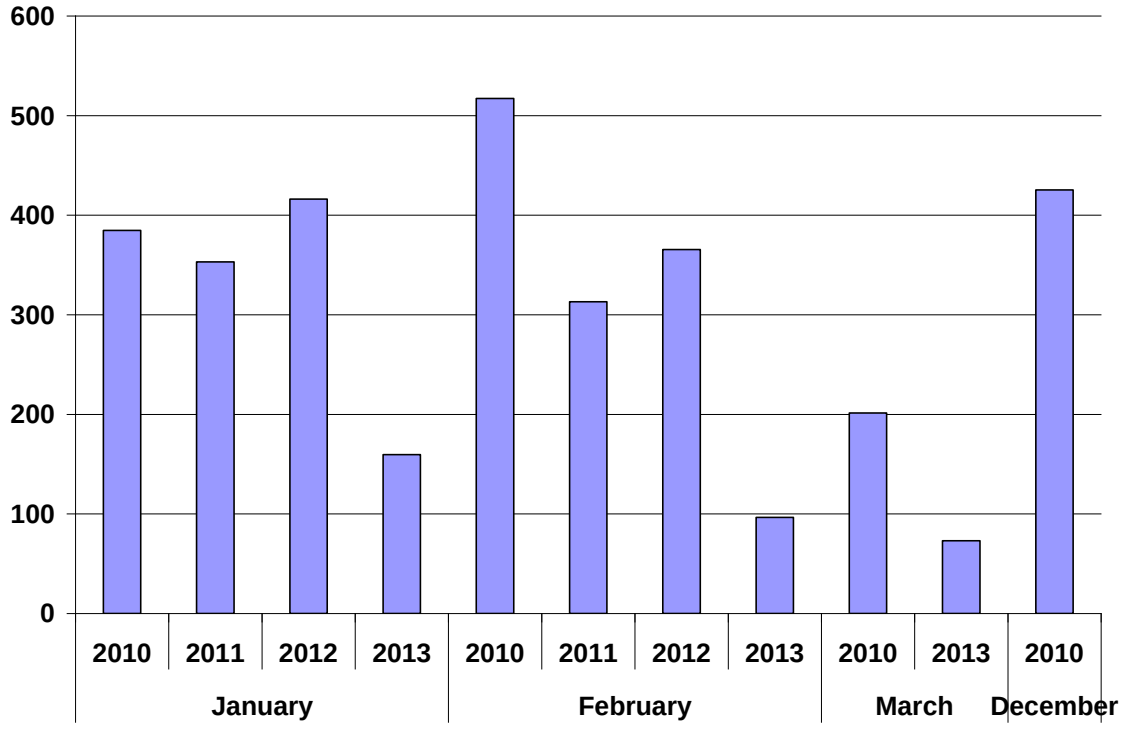

Figure 2 Average lbs/hr (CPUEs) by month for draggers that were sampled during the 2011, 2012, and 2013 seasons.

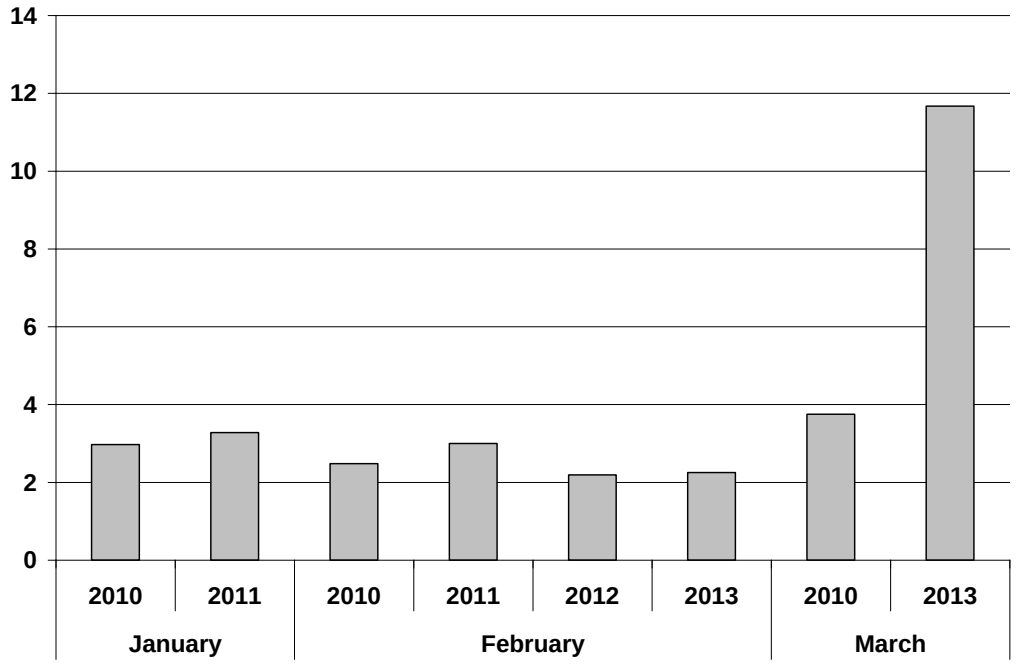

Figure 3 Average set over days by month for trappers sampled during the 2011, 2012, and 2013 seasons.

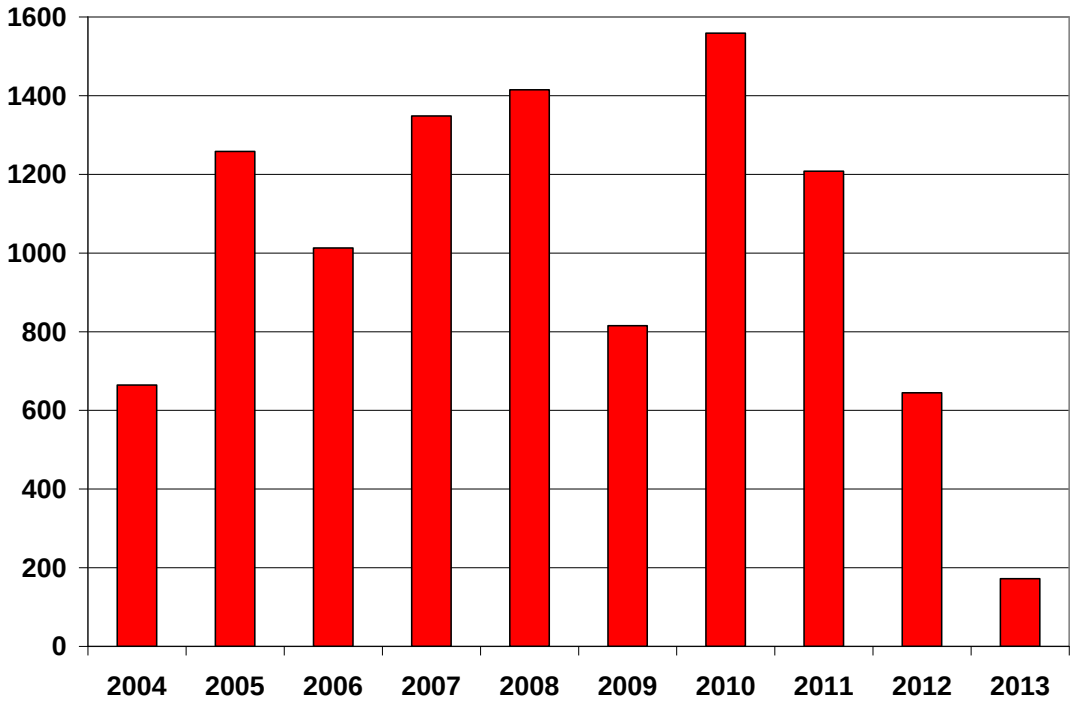

Figure 4 Average daily catch in pounds for trappers for the 2004-2013 seasons.

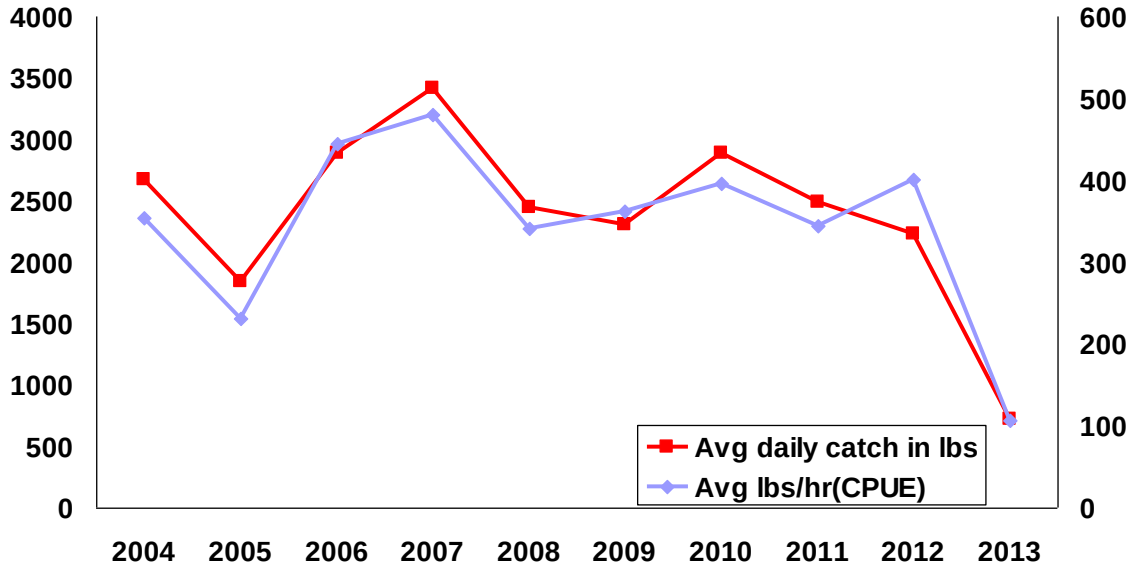

Figure 5 Average daily catch and average lbs/hr drag time (CPUE) for the 2004 -2013 seasons.

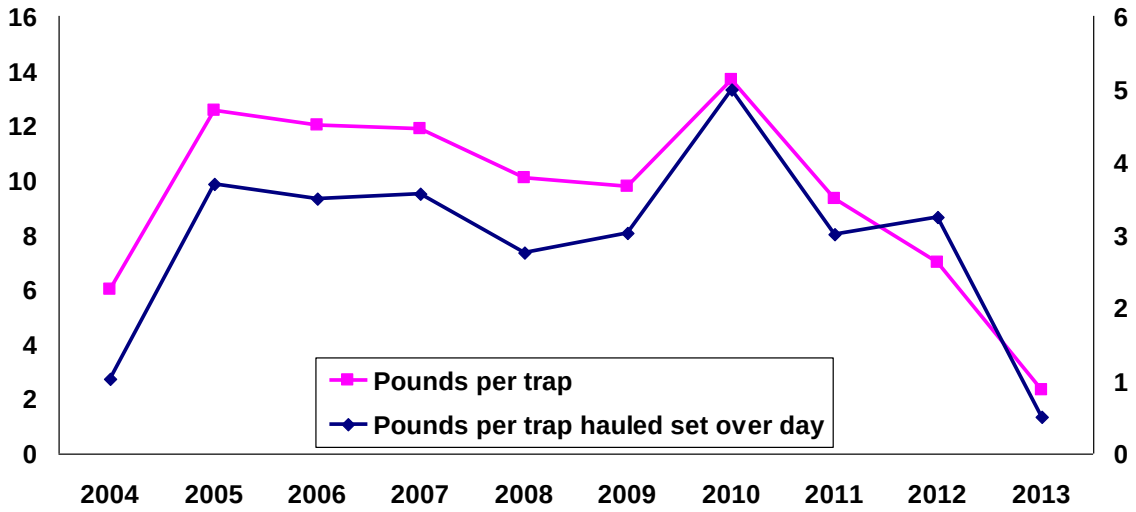

Figure 6 Average lbs/trap and the average lbs/trap/set-over-day for the 2004-2013 seasons.

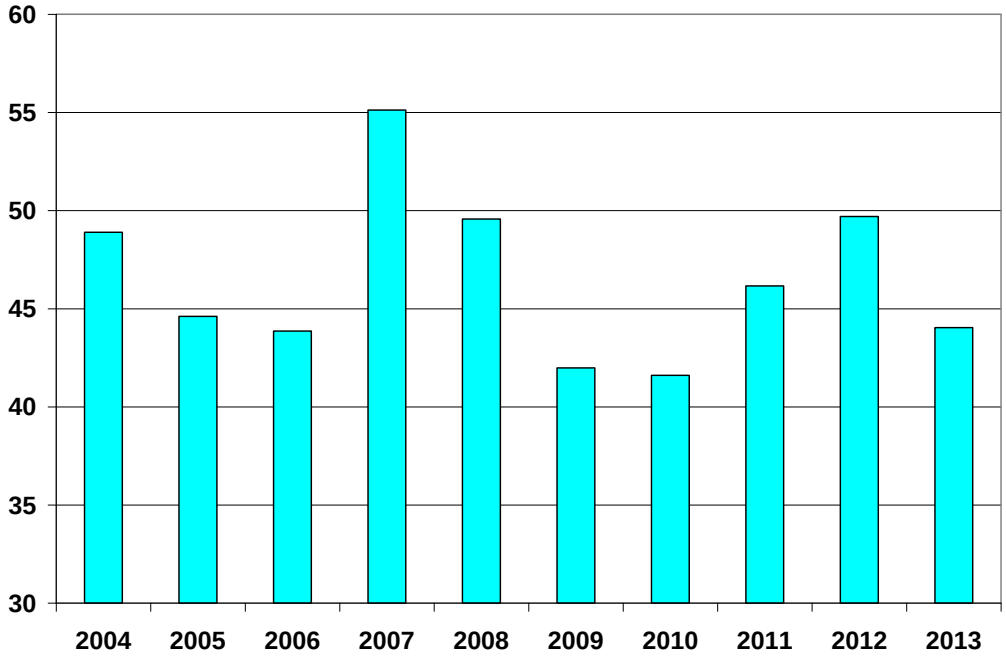

Figure 7 Dragger average count per pound for the 2004 - 2013 seasons. All species of shrimp were included in the counts / pound.

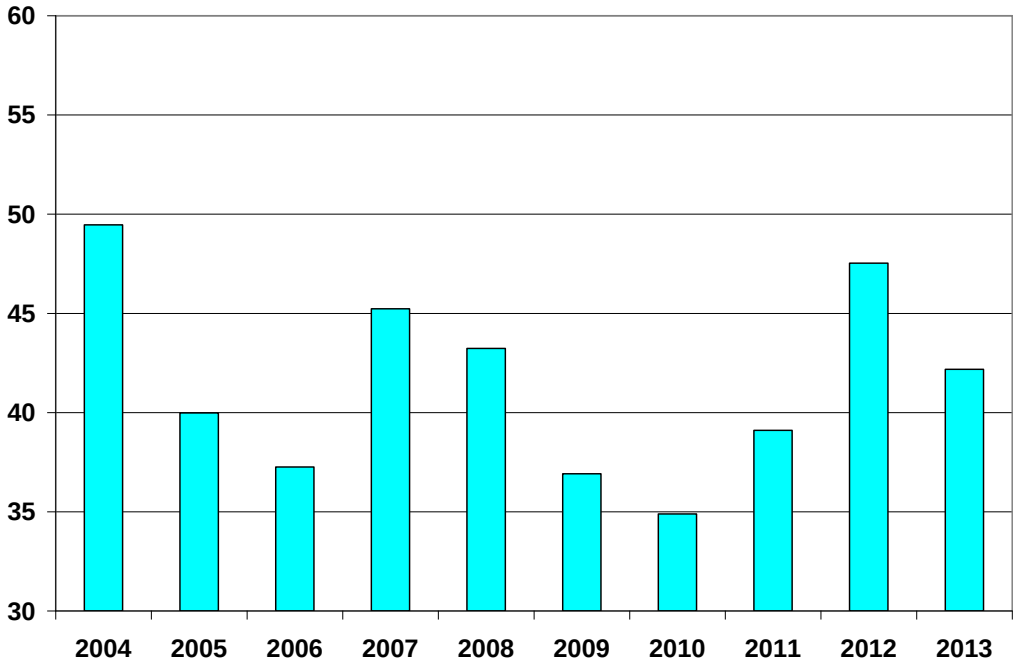

Figure 8 Trapper average count per pound for the 2004 - 2013 seasons. All species of shrimp were included in the counts / pound.

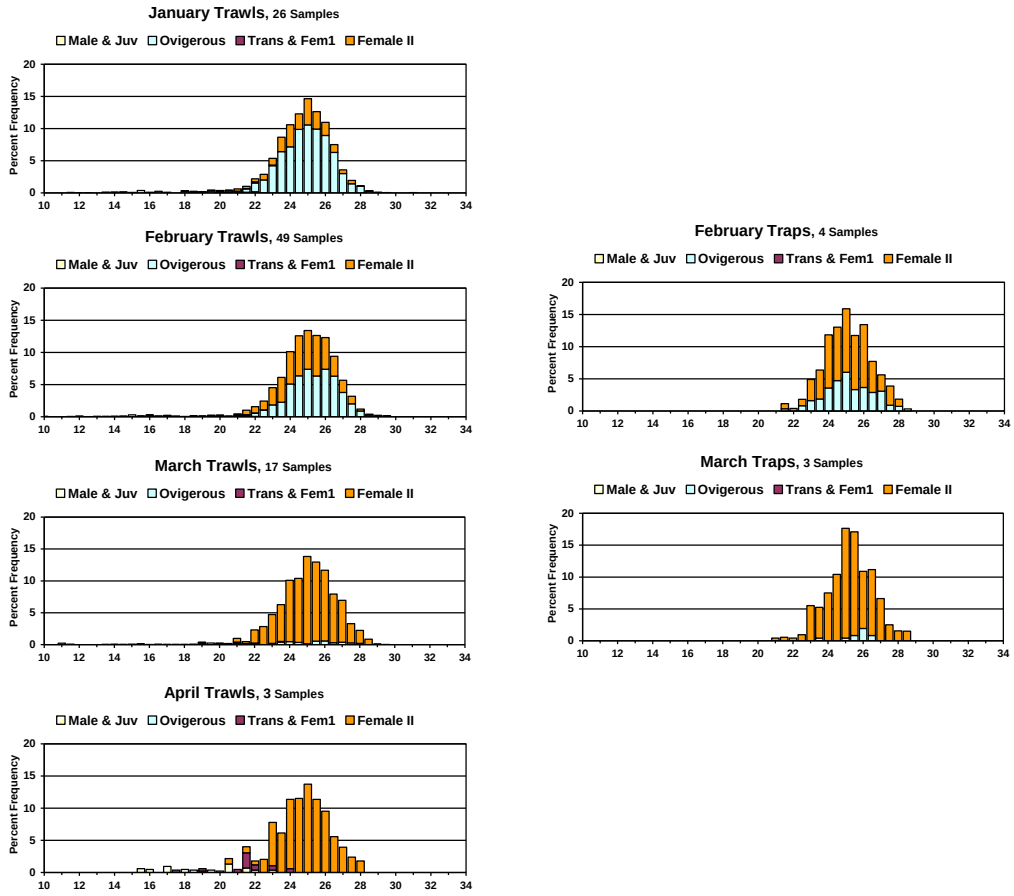

Figure 9 Relative length frequency and sexual stage data from the port samples by month for draggers (left) and trappers (right), *P. borealis* only.