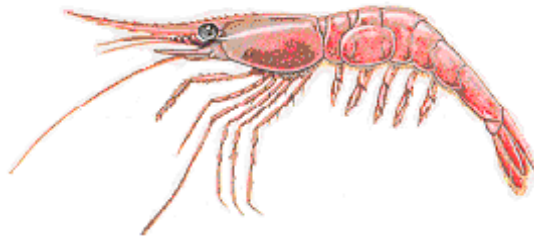


**Commercial Port Sampling of
Northern Shrimp (*Pandalus borealis*)
Along the Maine Coast**
Season Summary for the 2011 Shrimp Season
December 1, 2010 – February 28, 2011

**By
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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 2011 season consisted of Lessie White Jr., Marilyn Lash, Robert Russell and Lisa Pinkham.

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 \$3.00 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 89% 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 90 days allowed for shrimping between December 1, 2010 – February 28, 2011.

During the 90 days allowed for shrimping for the 2011 season, 262 shrimp samples and corresponding captain interviews were obtained from 176 draggers (94 different draggers) sampled at 24 dealers from Kennebunkport to Winter Harbor and from 86 trappers (50 different trappers) sampled at 8 dealers from Southport to Tentants Harbor. The lengths of the boats sampled ranged from 24' – 82' and the samples came from 26 different fishing grounds. The breakdown for each month can be found in Table 1.

The opening of the 2011 shrimp season on Wednesday, December 1 was marked by high catch rates of nice shrimp. The shrimp were also in close to shore (40-50 fathom) earlier than normal. There was more activity than in recent years due to market demand. The price for December was higher than last year's. In December, the average daily catch per boat was 2,532.46 lbs and the average per hour catch rate was 425.30 lbs/hr. At the end of December the catch rates had decreased, the shrimp appeared to be mixed sizes, and majorities of the shrimp were still egged.

Overall, for January the average catch per boat was 2,597.96 lbs, up 65.5 lbs from December's average catch. The average catch rate was 352.98 lbs/hr which was down about 72 lbs/hr from December's numbers. At the end of January it appeared that most boats were fishing in 40-50 fathoms of water but there was a wide range from 25 to 60 fathoms being fished. There appeared to be mixy catches of shrimp this month along the whole coast and majorities of the shrimp were still egged.

For February, the overall catch per boat was 2,343.34 lbs, down 254.62 lbs from January's average catch. The average catch rate was 312.93 lbs/hr, down about 40 lbs/hr from January's numbers. At the end of February it appeared that the shrimp in the western part of the state were moving off and were at 40-50 fathom depths and well over 50% had "dropped" their eggs. In the eastern part of the state the shrimp were still in 30-40 fathom depths and around 50% had "dropped" their eggs. The dragger and trapper catches in the western part of the state had decreased and the dragger and trapper catches in the eastern part of the state had started to dip by the end of the month.

The average daily catch for draggers by month in 2011 was the highest in December, was the second highest in January and the lowest in February when compared to the same months from the 2009 and 2010 seasons (Figure 1). This was most likely due to the shrimp being bunched up inshore at the beginning of December, and as the season wore on and more boats joined the abundance decreased. The average CPUE's for draggers by month in 2011 showed the same trend as the average daily catches. The 2011 season had the highest CPUE in December, decreasing in January and decreasing again in February. This was the first time in at least 15 years that December has had the highest CPUE (Figure 2).

The average numbers of set-over-days per catch for trappers by month in 2011 were similar to the 2009 and 2010 seasons (Figure 3).

When compared with the previous 9 years, the average daily catch by the draggers, and their CPUEs, for the 2011 season, were within recent ranges (Figure 5).

In looking at the past 10 years for trappers, the 2011 average pounds per trap were within recent ranges (Figure 6). The average daily catch for trappers in 2011 decreased by about 351 pounds a day from the 2010 season (Figure 4). The 2010 season is the peak season over the last 10 years.

The average counts per pound for draggers and trappers in 2011 were within recent ranges from the last 10 years (Figure 7-8), but higher than 2009 and 2010. This was probably due to the lack of the presumed 2006 year class and mixy catches throughout the season.

The samples taken from trawlers in December show (Figure 9) that the catches were "mixy", containing some males, transitionals, female I (females that have not yet carried eggs), and female II (females that have carried and hatched their eggs). The majority of the catch was ovigerous females. In January the catches by trawlers didn't change a lot; transitionals and female I shrimp size range widened. There were a few more small males, a few less large males and more female II shrimp. In February the catches were less mixy with a majority of the catch still ovigerous females; there were a lot more female II shrimp, and a lot fewer male shrimp.

The trapper catches for January showed (Figure 9) mostly ovigerous females with a few female II shrimp. February the trappers were catching a slight majority of ovigerous females but there were a lot of female II shrimp in the catch.

The price being paid for December ranged from \$.69 to \$.80 per pound with the average being \$.76 per pound. The price paid for January ranged from \$.67 to \$.95 per pound with the average being \$.76 per pound. For February the price paid was \$.62 to \$.85 per pound with most going for around \$.71 per pound.

December 2010 comments that were expressed:

Comments heard during the opening week: There were no comments for the opening week. The weather was not very good but there were more guys rigged up for shrimp fishing than there had been in the recent past.

Comments heard during the second week: The only comments were by a fisherman that said "The shrimp seem to be closer to shore earlier this year". "We have been fishing just outside of the three mile line."

Comments heard during the fifth week: One of the fishermen stated "Catches and catch rates have decreased since the beginning of December. Might be due to the storms, the shrimp may have been broken up or they may have been blown inshore."

January 2011 comments that were expressed:

Comments heard during the sixth week: The comment heard this week was in response to a rumor of six or seven trays of small haddock being caught per tow around Mile Rock. The fisherman said "I have been fishing all season at Mile Rock and we are seeing some small haddock there. We are getting about half a bucket a day. The most we have had this year for a whole day was around ¼ to ½ a tote." It was later determined that the rumor concerned by-catch of small whiting not small haddock.

Comments heard during the seventh week: The only comment for this week was from a trapper that said "It hasn't been too good yet. It is still too early."

February 2011 comments that were expressed:

Comments heard during the twelfth week: A trapper commented that "The start of the season should be in January so that there is not as much gear conflict and also so that we can at least fish into March."

Table 1 The following is listed for each month from December, 2010 - February, 2011: 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 December 1 - February 28 2011 Season

	Dealers Visited & Locations ¹	Samples Collected	Boats			Fishing Grounds	Total catch in (lbs)		Boat Days	Draggers	Total Hrs.	lbs./Hr Drag Time	Total	Total	Average lbs./trap	Average lbs/trap haul set over day
			Draggers Sampled ²	Trappers Sampled ²	Length Range (ft)		Drillers	Drag		Traps Hauled	Set Over Days					
Dec. 2010	9 Portland, ME to Port Clyde, ME	23	23	0	36'-82'	10	60,779	0	24	2,532.46	142.91	425.30	0	0	0	0
Jan. 2011	19 Saco, ME to Winter Harbor, ME	112	82	30	31'-81'	17	212,933	29,428	112	2,597.96	603.25	352.98	3,652	98.5	8.06	2.30
Feb. 2011	23 Kennebunkport, ME to Sorrento, ME	127	71	56	24'-66'	19	166,377	74,427	127	2,343.34	531.67	312.93	7,508	168.03	9.91	3.42
<u>Season Totals:</u>	27 Kennebunkport, ME to Winter Harbor, ME different dealers	262	176	86	24'-82'	26	440,089	103,855	263	2,486.39	1,277.83	344.40	11,160	266.53	9.31	3.01
			94	50		different fishing grounds										

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.

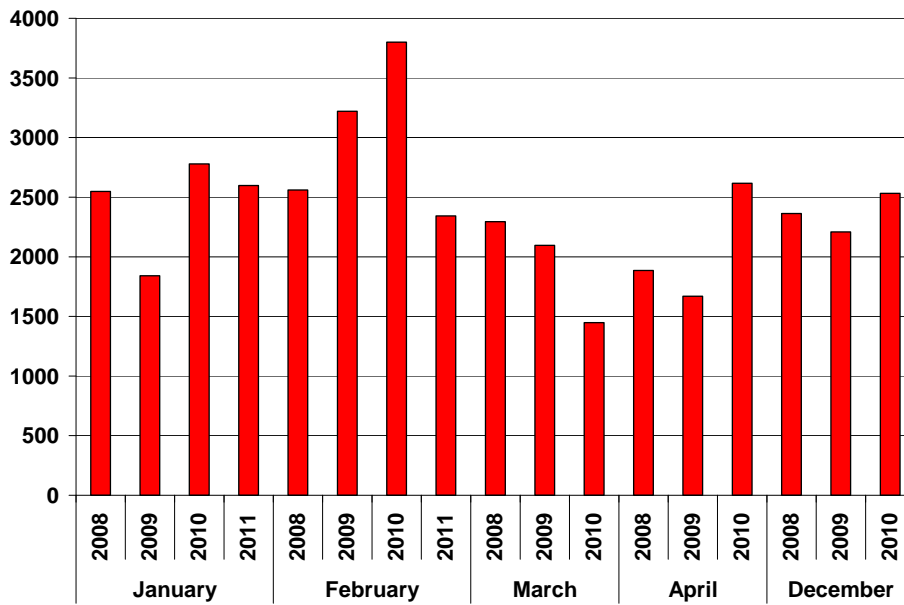


Figure 1 Average daily catches by month for draggers that were sampled during the 2009, 2010, and 2011 seasons.

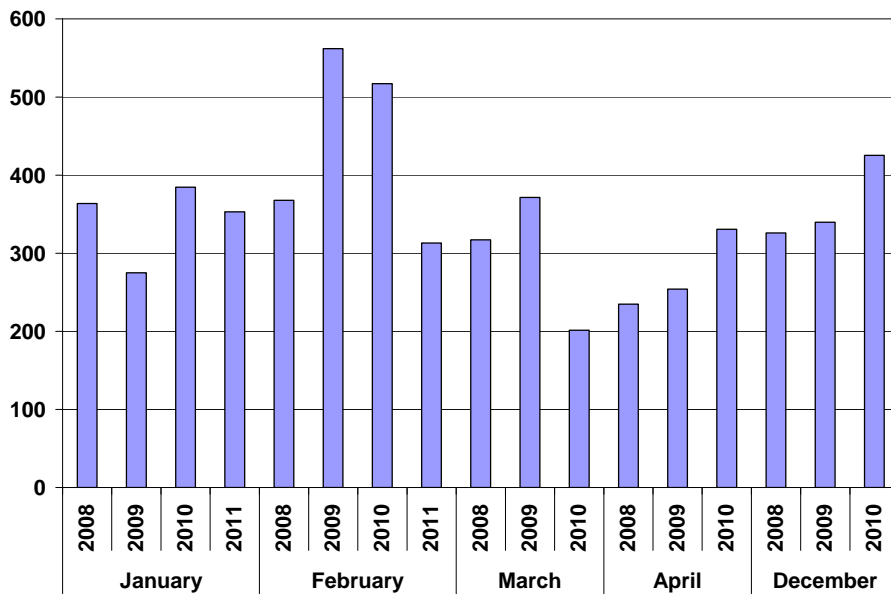


Figure 2 Average lbs/hr (CPUEs) by month for draggers that were sampled during the 2009, 2010, and 2011 seasons.

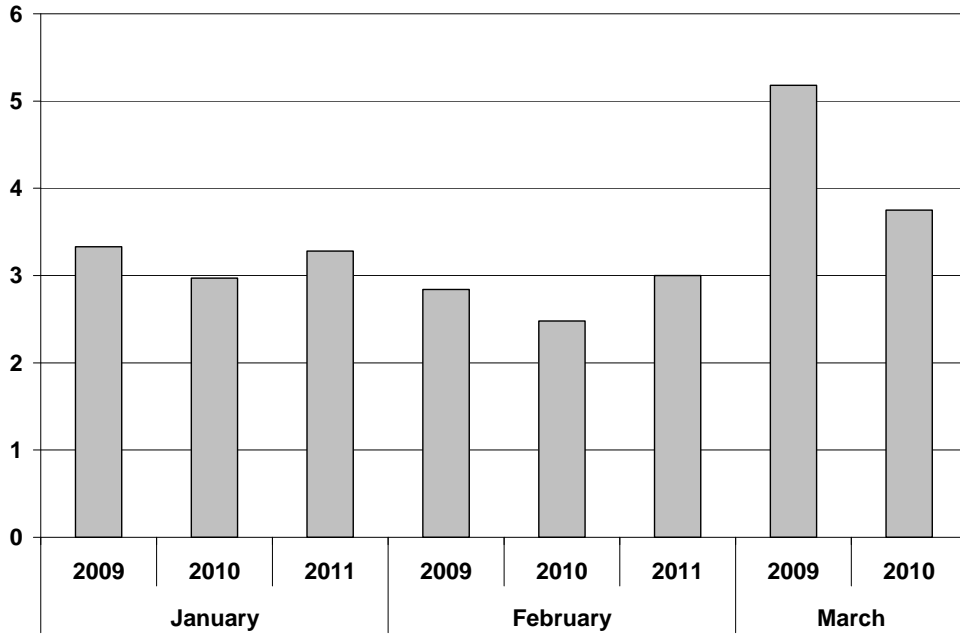


Figure 3 Average set over days by month for trappers sampled during the 2009, 2010, and 2011 seasons.

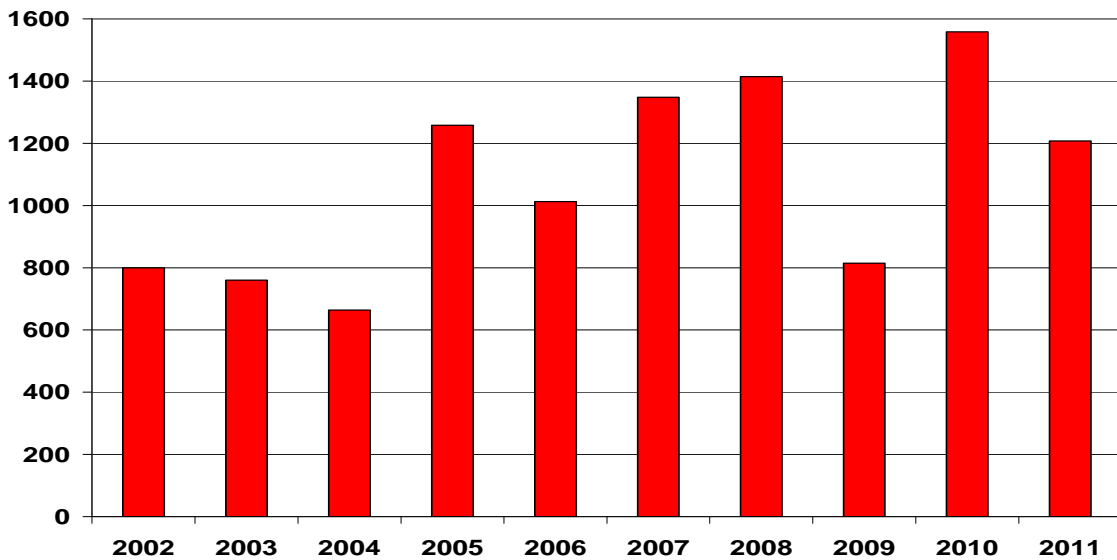


Figure 4 Average daily catch per day in pounds for trappers for the 2002-2011 seasons.

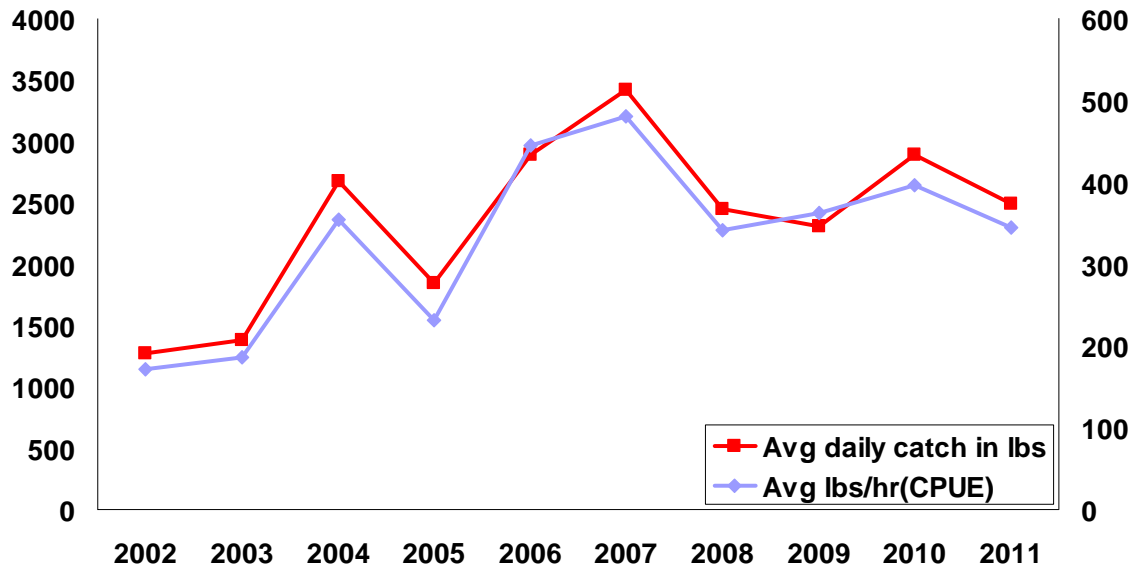


Figure 5 Average daily catch (lbs, left axis) and average lbs/hr drag time (CPUE, right axis) for the 2002 -2011 trawl seasons.

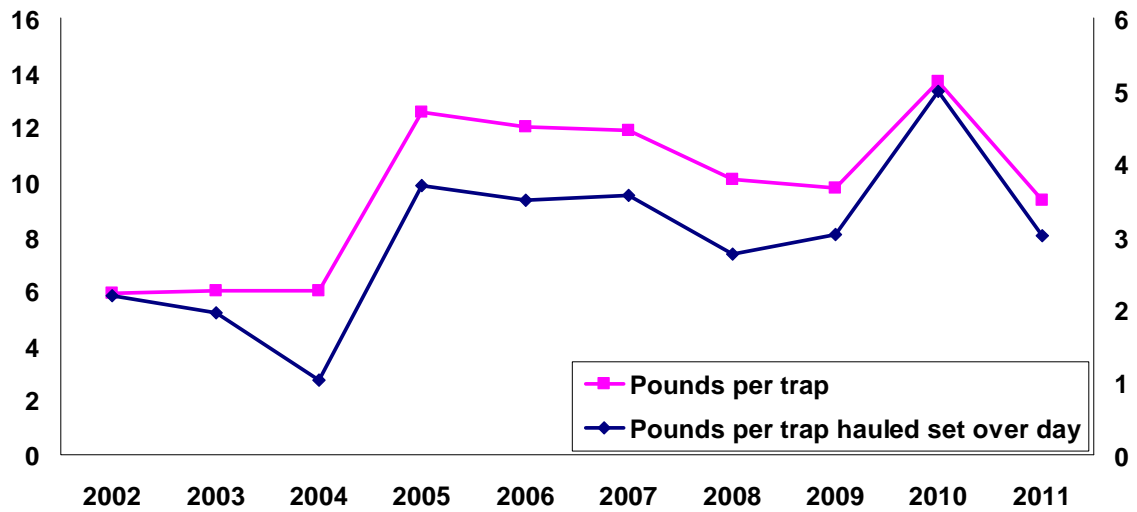


Figure 6 Average lbs/trap and the average lbs/trap/set-over-day for the 2002-2011 seasons.

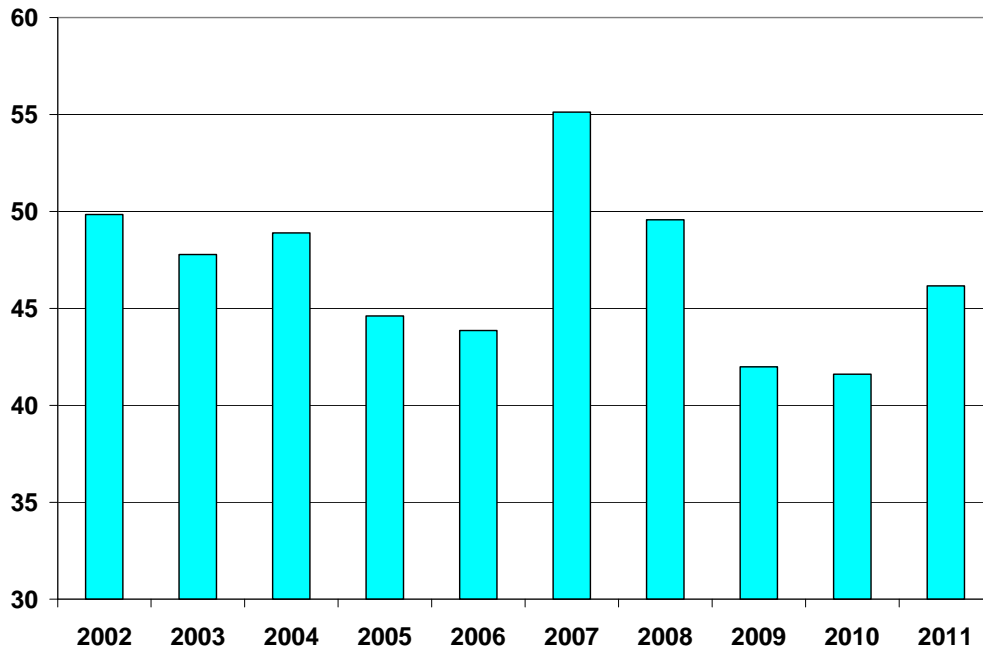


Figure 7 Dragger average count per pound for the 2002 - 2011 seasons. All species of shrimp were included in the counts / pound.

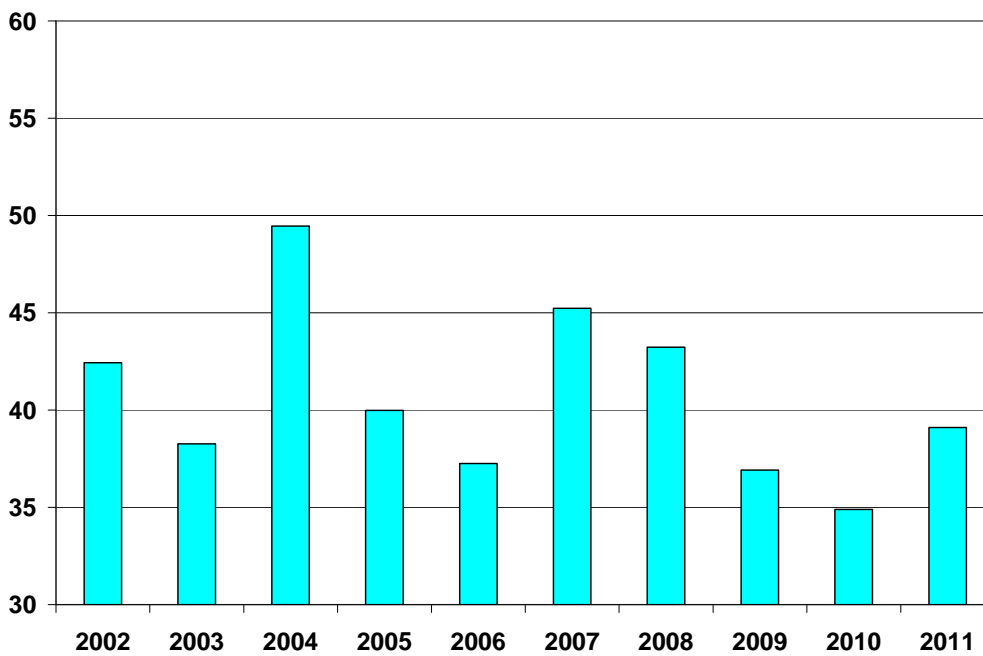
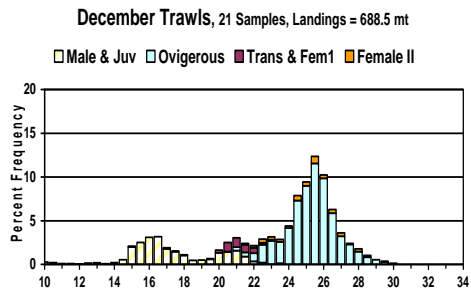


Figure 8 Trapper average count per pound for the 2002 - 2011 seasons. All species of shrimp were included in the counts / pound.



December Traps, No Samples, Landings = 1.5 mt

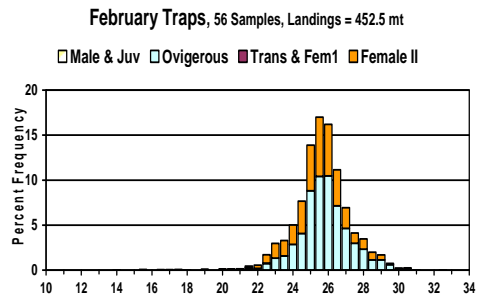
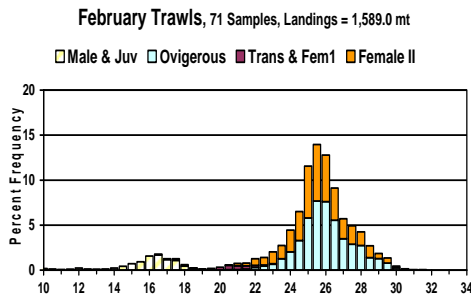
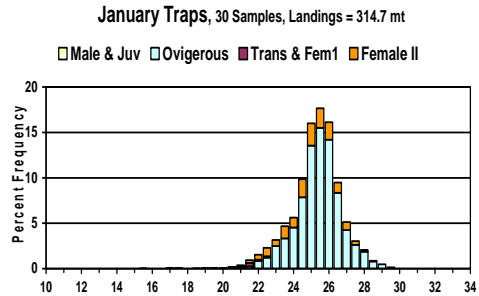
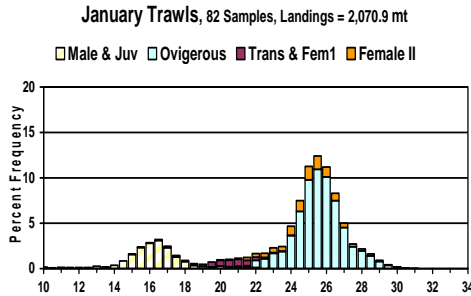


Figure 9 Relative length frequency and sexual stage data from the port samples by month for dragnets (left) and trappers (right), *P. borealis* only.