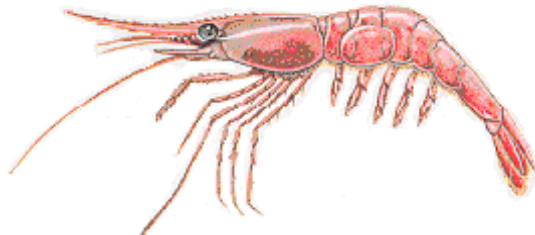


**Commercial Port Sampling of
Northern Shrimp (*Pandalus borealis*)
Along the Maine Coast**
Season Summary for the 2009 Shrimp Season
December 1, 2008 – May 29, 2009

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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 24 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 2009 season consisted of Lessie White Jr. and Marilyn Lash.

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 fished, 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 180 days allowed for shrimping between December 1, 2008 – May 29, 2009.

During the 180 days allowed for shrimping for the 2009 season, 144 shrimp samples and corresponding captain interviews were obtained from 108 draggers (49 different draggers) sampled at 20 dealers from Saco to Bar Harbor and from 36 trappers (22 different trappers) sampled at 6 dealers from Southport to Tenants Harbor. The lengths of the boats sampled ranged from 27' – 82' and the samples came from 21 different fishing grounds. The breakdown for each month can be found in Table 1.

The opening of the 2009 shrimp season on Monday, December 1 was marked by average catch rates of relatively large shrimp. The price was a little higher than last year. In December, the average daily catch per boat was 2,362.88 lbs and the average per hour catch rate was 325.91 lbs/hr (Table 1). At the end of December it appeared that the shrimp were still out in 60-80 fathom depths and the majority of the shrimp were still egged.

Overall, for January the average catch per boat was 1,842.03 lbs, down 520.85 lbs from December's average catch. The average catch rate was 275.04 lbs/hr which was down about 51 lbs/hr from December's numbers. At the end of January it appeared that most boats were still fishing in 50 fathoms of water. There appeared to be good separation between male shrimp and female shrimp along the whole coast and the majority of the shrimp were still egged.

For February, the overall catch per boat was 3,220.44 lbs, up 1,378.41 lbs from January's average catch. The average catch rate was 561.92 lbs/hr, up about 287 lbs/hr from January's numbers. At the end of February it appeared that the shrimp were in 30-50 fathom depths and they had started to "drop" their eggs. The dragger catches and the trapped catches had increased by the end of the month.

The average catch per boat for March was 2,096.21 lbs which was down 1,124.23 lbs from February's average catch. March's average catch rate was 371.39 lbs/hr which was about 191 lbs/hr lower than that of the previous month. At the end of March it appeared that all of the shrimp had "dropped" their eggs and were out in 60-80 fathoms. The trappers catch had dropped off so much that they had stopped fishing but the draggers catches had not started to increase again by the end of the month.

Overall, for April the average catch per boat was 1,669.29 lbs, down 426.92 lbs from that of March. The average catch rate was 254.02 lbs/hr which was down about 117 lbs/hr from March's numbers. It appeared that when the fishermen stopped fishing by the middle of April the shrimp had completely moved off-shore in 70-90 fathoms and had mixed with the males.

The average daily catch for draggers by month in 2009 was the lowest in 4 out of the 5 months when compared to the same months from the 2007 and 2008 seasons (Figure 1). This was most likely due to the boats being on quotas from the processors. The average CPUE's for draggers by month in 2009 showed a different story. The 2009 season had the lowest CPUE in only 2 of the 5 months and had the highest CPUE for 1 of the 5 months (Figure 2).

The average set over days for trappers by month in 2009 was within the range established by the 2007 and 2008 seasons for all months (Figure 3).

When compared with the previous 9 years, the average daily catch by the draggers, and their CPUE, for the 2009 season, were above average, but below the 2007 peak (Figure 5).

In looking at the past 10 years for trappers, the 2009 average pounds per trap and the pounds per trap hauled set over day were above the time series averages, but below the 10 year high set by the 2005 season (Figure 6). The average daily catch for trappers in 2009 declined by about 600 pounds a day from the 2008 season (Figure 4). The 2008 season is the peak season over the last 10 years. The average daily catch for trappers in 2009 was just below the 10 year average, most likely due to the quotas set by the processors.

The average count per pound for draggers in 2009 was the lowest it has been over the last 10 years (Figure 7). The count per pound for trappers in 2009 was the lowest it had been since the 2000 season (Figure 8). This was probably due to the strength of the presumed 2004 year class.

The samples taken from trawlers in December show (Figure 9) that the catches were "mixy", containing males, transitionals, female I (females that have not yet carried eggs), as well as ovigerous females. In January the catches by trawlers changed a little bit with fewer males, transitionals, and female I shrimp and the beginning of the presence of female II shrimp (females that have carried and hatched their eggs). There was also a small bump of males representing the presumed 2007 year class. In February the catches had changed to mostly ovigerous females with a few more female II shrimp showing up. In March the catches had switched to mostly female II shrimp with some ovigerous and a few males, transitionals and female I shrimp. April catches by trawlers showed mostly female II shrimp, and egg hatch nearly complete. But there were a lot of males in the presumed 2007 and 2008 year classes showing up and quite a few transitionals and female I shrimp.

The trapper catches for January showed (Figure 9) mostly ovigerous females with a few female II shrimp. February the trappers were catching quite a few female II shrimp but the majority was still ovigerous females. In March the catch had changed to mostly female II shrimp with a few ovigerous females. Trapper catches were generally less "mixy" than the draggers', and more likely to catch the shrimp after egg hatch. The egg hatch this year was later than last year but not as late as the year before.

The price being paid for December ranged from \$.38 to \$.75 per pound with the average being \$.51 per pound. The price paid for January ranged from \$.35 to \$1.00 per pound with the average being \$.45 per pound. For February the price paid was \$.35 to \$.60 per pound with most going for around \$.37 per pound. The price being paid for March ranged from \$.27 to \$.41 per pound with most going for around \$.36 per pound. The price paid for April ranged from \$.31 to \$.45 per pound with the average being \$.38 per pound.

December 2008 comments that were expressed:

Comments heard during the opening week: There was one comment the first week by a fisherman that said “the quality of the shrimp was perfect and we need more money for our shrimp”. The counts on the samples from the first week averaged 42/lb, which is better than the usual December counts.

Comments heard during the second week: During the past week no boats were sampled due to high winds, high seas, a snow storm, and not a lot of activity yet.

Comments heard during the fourth week: During the past week no boats were sampled due to high winds, high seas, a snow storm, Christmas, and not a lot of activity yet.

January 2009 comments that were expressed:

Comments heard during the sixth week: Most of the comments heard this week from fishermen were about the low catches and not being able to find the shrimp. A fisherman that had started fishing at the beginning of the New Year stated “It was really good the first day I went out and has dropped off ever since.” Two more fishermen said “It’s been really spotty catch wise.” With two more fishermen saying “It doesn’t look good.” Another fisherman stated “There is nothing going on outside, most of the shrimp seem to be inshore.” Finally a fisherman said “I can’t seem to find them anywhere and when you do find them they are mixed in with lots of whiting, herring, and dabs.”

Comments heard during the seventh week: The only comments for this week were about the catch being really spotty. In one place they might do well for one tow and then nothing for the next tow, in other places they might not do so well the first tow but then the second tow would be really good.

Comments heard during the eighth week: Comments by the dragger captains this week were based around the catch rates. Most of the captains said “Where the hell are all the shrimp that were in your survey?” One captain elaborated this sentiment with “The survey should just be thrown out the window. It said there were lots of shrimp this year and we are not seeing them anywhere. You scientists should have your paychecks put into a fund for the shrimp fishermen since you can’t get the shrimp population right. We put all this money into a shrimp season based on your bad information to us and we’re the one’s that suffer and you get raises. It’s not right.” Another fisherman commented “We need to get more money for our shrimp. We can’t make it on this poundage at this price. Something has to give.”

Comments heard during the ninth week: This week the most heard comment was “Where are all of the shrimp?” One fisherman stated “At least the shrimp we are catching are a good size.”

February 2009 comments that were expressed:

Comments heard during the eleventh week: The most heard comment this week was “Where are all the shrimp you scientists said there would be?” Another fisherman said “Find more market.” The final comments that were heard were “We need the state to promote shrimp better. They should be promoting them to the local restaurants.”

Comments heard during the twelfth week: A dragger commented “There are lots of small shrimp hanging off the twine when I haul back but we are not seeing them in the

catch.” A trapper stated “The 25 day season killed the market.” Another trapper said “The price sucks and the catch sucks.” The final comment heard was from a trapper who said “The shrimp seem to have come in early this year.”

March 2009 comments that were expressed:

Comments heard during the fourteenth week: One fisherman said “It’s all over for this season.”

Comments heard during the seventeenth week: Most of the comments this week centered on the price and market. One fisherman stated “The price sucks.” While another said “We need help with our markets.” A third fisherman commented “The state needs to advertize shrimp more.” Another fisherman said “We need to be getting a higher price for our shrimp.” The final comment from a fisherman was “Leave the f***ing season alone.”

April 2009 comments that were expressed:

Comments heard during the eighteenth week: One of the two boats’ catches was sorted through to remove small shrimp and fish. About one hundred pounds of small shrimp and fish was removed. The other boat was using a square mesh lengthening piece and cod end.

Table 1 The following is listed for each month from December, 2008 - April, 2009: 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 - May 29 2009 Season

		Boats _____				* No samples were collected in May													
Month	Dealers Visited & Locations ¹	Samples Collected	Boats			Fishing Grounds	Total catch in (lbs)			Boat		Draggers		Total Hrs.		Total		Average	
			Draggers Sampled ²	Trappers Sampled ²	Length Range (ft)		Draggers	Trappers	Days	Av. Catch Per Day (lbs)	Drag Time	lbs./Hr Drag Time	Traps Hauled	Set Over Days	Average lbs./trap	lbs/trap haul set over day			
Dec. 2008	6 Biddeford Pool, ME to Port Clyde, ME	17	17	0	38'-60'	6	40,169	0	17	2,362.88	123.25	325.91	0	0	0	0			
Jan. 2009	14 Saco, ME to Port Clyde, ME	44	38	6	27'-60'	10	69,997	4,071	44	1,842.03	254.50	275.04	633	20	6.43	1.96			
Feb. 2009	16 Saco, ME to Stonington, ME	46	27	19	30'-82'	13	86,952	18,293	46	3,220.44	154.74	561.92	1,733	54	10.56	3.80			
Mar. 2009	12 Saco, ME to Bar Harbor, ME	30	19	11	27'-82'	12	39,828	5,347	30	2,096.21	107.24	371.39	469	57	11.40	2.33			
Apr. 2009	4 Portland, ME to New Harbor, ME	7	7	0	35'-60'	5	11,685	0	7	1,669.29	46.00	254.02	0	0	0	0			
<u>Season Totals:</u>	25 Biddeford Pool, ME to Bar Harbor, ME different dealers	144	108 49 different draggers	36 22 different trappers	27'-82'	21 different fishing grounds	248,631	27,711	144	2,302.14	685.73	362.58	2,835	131.00	9.77	3.02			

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.

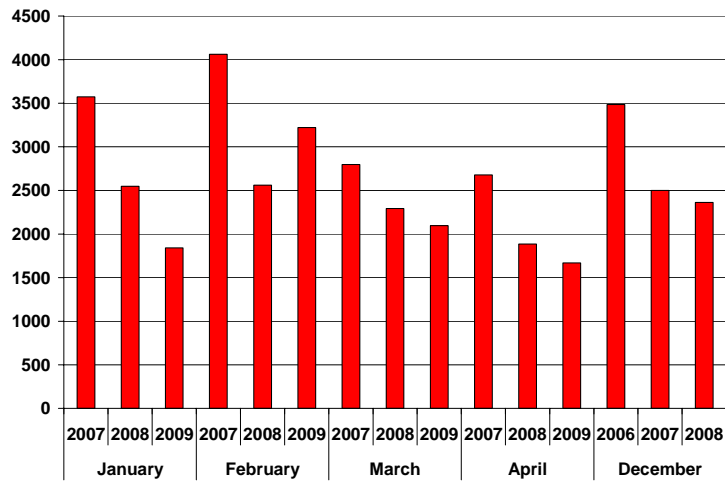


Figure 1 Average daily catches by month for draggers that were sampled during the 2007, 2008, and 2009 seasons.

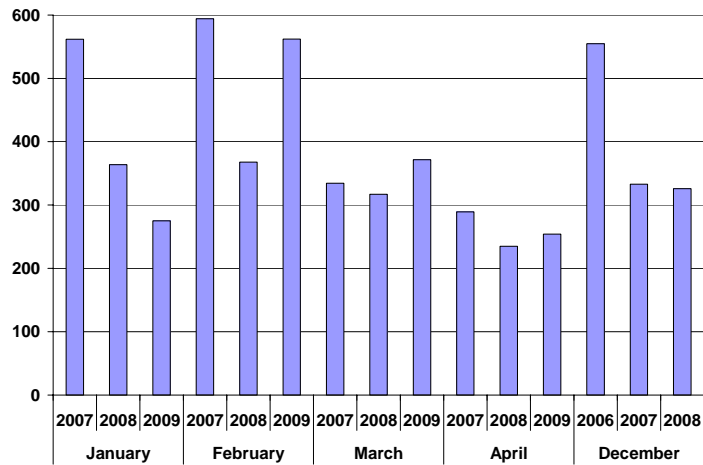


Figure 2 Average lbs/hr (CPUEs) by month for draggers that were sampled during the 2007, 2008, and 2009 seasons.

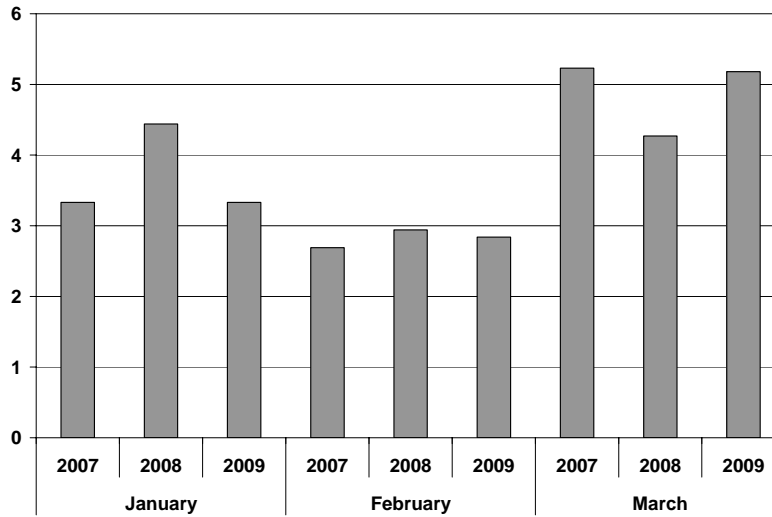


Figure 3 Average set over days by month for trappers sampled during the 2007, 2008, and 2009 seasons.

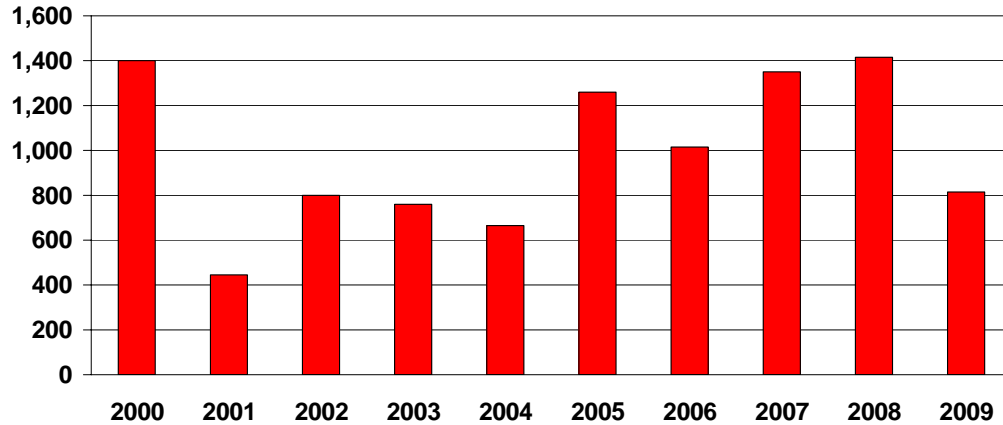


Figure 4 Average daily catch in pounds for trappers for the 2000-2009 seasons.

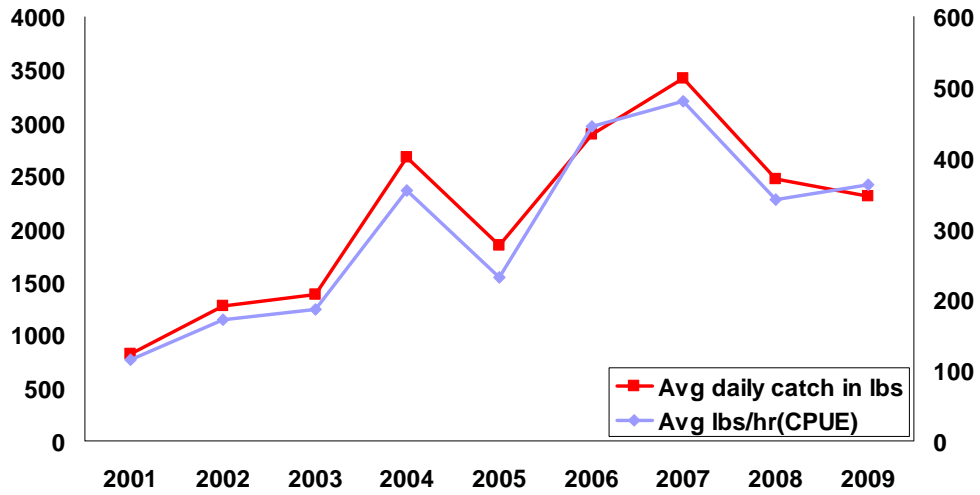


Figure 5 Average daily catch and average lbs/hr drag time (CPUE) for the 2001 -2009 seasons.

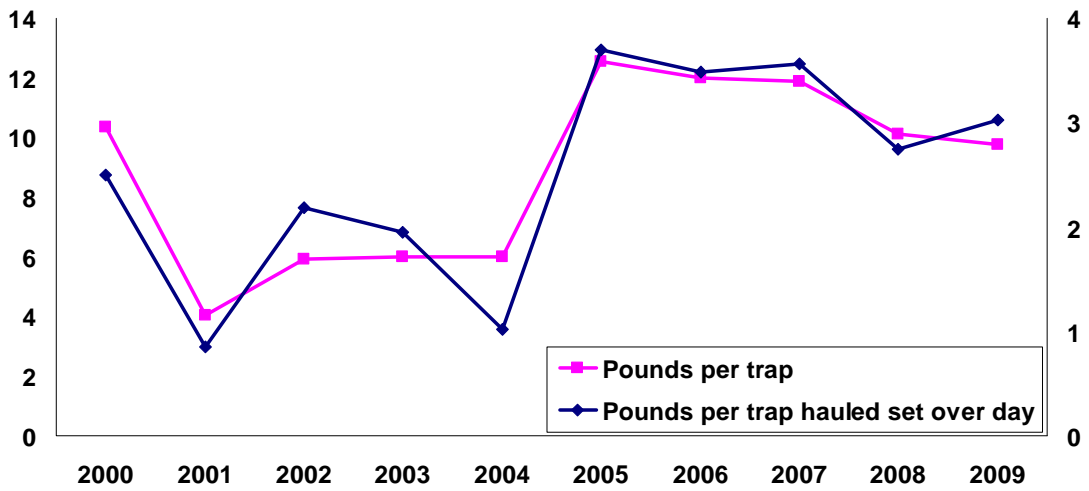


Figure 6 Average lbs/trap and the average lbs/trap/set-over-day for the 2000-2009 seasons.

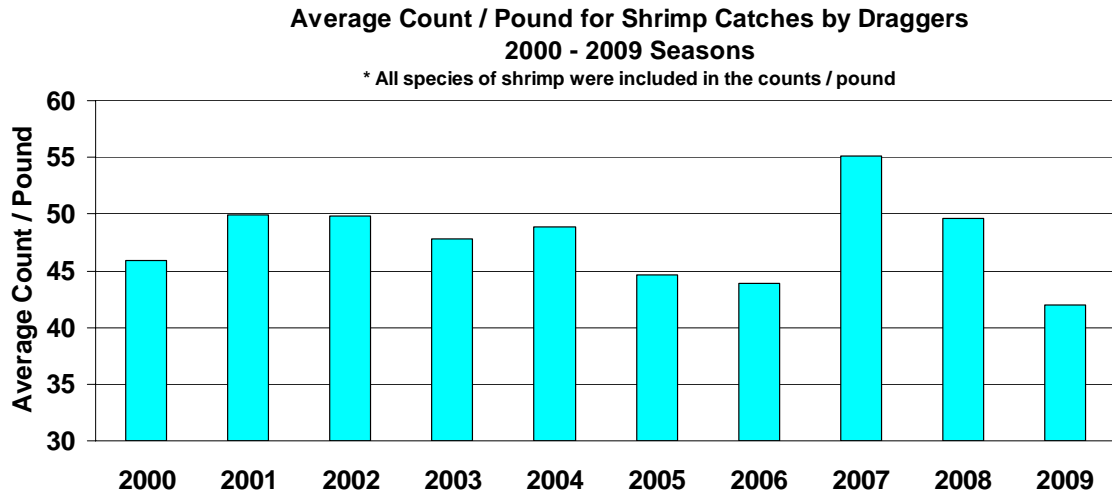


Figure 7 Dragger average count per pound for the 2000 - 2009 seasons.

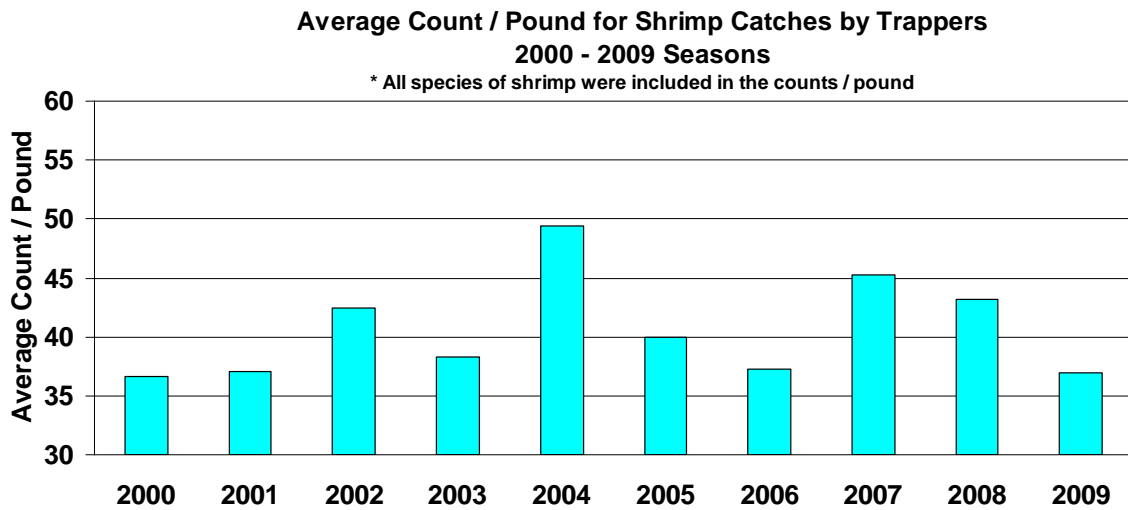


Figure 8 Trapper average count per pound for the 2000 - 2009 seasons.

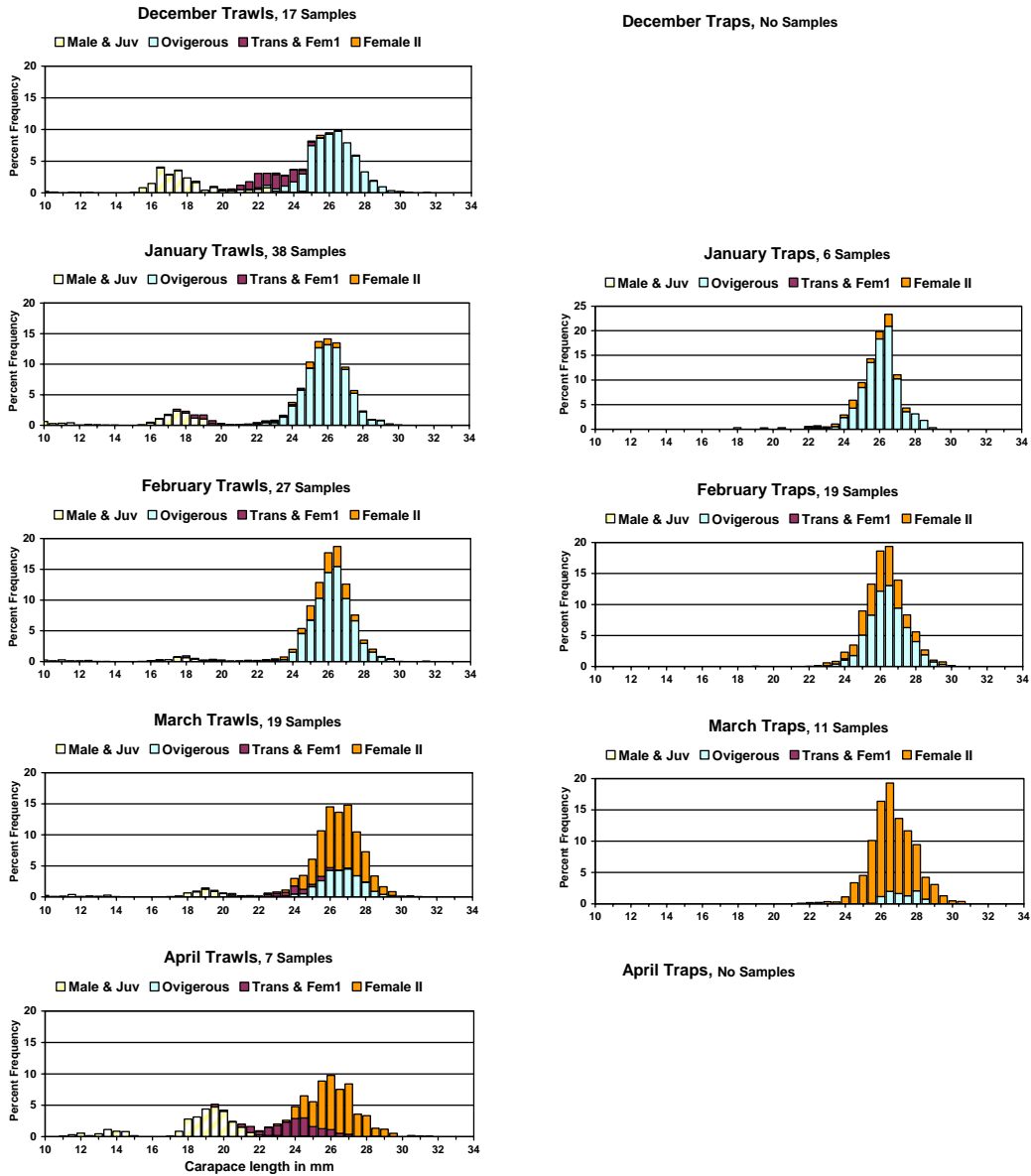


Figure 9 Relative length frequency and sexual stage data from the port samples by month for dragners (left) and trappers (right), *P. borealis* only.