

FISH COMMISSION OF OREGON
TRAWL INVESTIGATIONS

Report of Cruise 68-5, Shrimp

Vessel: MVSunrise, chartered trawler

Dates: May 7 - June 19, 1968

- Objectives:
1. To determine the vertical distribution of pink shrimp (Pandalus jordani).
 2. To collect associated oceanographic data.
 3. To compare size, sex and age composition of shrimp caught at various depths.
 4. To bring in live shrimp and sole for aquarium study.

Methods: Thirty-four shrimp pots were baited with frozen ground fish and fished for pink shrimp. Seventeen pots were attached at 5-fathom intervals to a main line. Two strings of pots were fished on each trip. Pots were pulled at 3-to-4-hour intervals for 24 hours.

Shrimp caught were put in plastic bags and iced. All shrimp were sexed and measured at the laboratory. No fish were caught in the pots during this cruise.

The exact depth at which the pots were fishing can be approximated. The main lines were 85 fathoms long. An anchor with 20 feet of chain was used to anchor each string during trip one. Two anchors with 40 feet of chain were used during trips two through five. During trips six and seven we anchored each string with one anchor and 40 feet of chain. Pots were attached at

5-fathom intervals with the first pot just above the anchor chain. A final pot was attached within 5 fathoms of the surface. During the cruise, 15 one-half hour tows were made with a 30-foot square midwater trawl. A $1\frac{1}{2}$ " stretch mesh liner was sewn in the midwater trawl prior to making the tows. A time-depth recorder was used to obtain net depth. In addition, 18 one-half hour bottom tows were made with a 41-foot Gulf semi-balloon trawl. Fish caught were counted and weighted. A $\frac{1}{2}$ to 1-pound shrimp sample was drawn from each tow catch and weighed, measured, and sexed.

Seven separate trips were made during the cruise.

Results: Trip one On May 7-9, 3 strings of gear were set during the day with shrimp pots at 5-fathom intervals on each string. After approximately 5 hours of daytime fishing we pulled one string of pots. No shrimp were caught, and because of worn attachment loops on the main line and the loss of one pot, we decided not to set the string again. We attempted to locate the other two strings approximately one hour after dark without success. At daylight we spent 6 hours searching for the missing strings with no luck. We reset the remaining string of pots that evening. One pickup was made approximately one hour after dark. No shrimp were caught. We reset the gear and three hours later tried to find it. Again,

however, we couldn't find the gear. The following morning we found this string inshore and north of where it had been set. It had drifted NE approximately $2\frac{1}{2}$ miles from where it was set. Only seven shrimp were caught (Table 1). We also found the two strings of gear lost the night before. They had drifted approximately 5 miles from where they had been set. Fourteen pots had worn through the attachment loops and were lost.

After returning to the laboratory, steel attachment rings were laced on the lines to prevent further losses of pots. One series of light readings were taken during the day.

Two bottom tows were made during the trip (Table 8).

Trip two Two strings of pots were fished May 11-12. Strings were rigged with double anchors and 40 feet of chain to prevent the drift encountered on trip one. Although pots were pulled at regular intervals throughout the night only 9 shrimp were caught (Table 2). No shrimp were caught during the day.

Four bottom tows were made (Table 8).

Trip three During the trip May 18-20, two strings of pots were fished. Only 5 shrimp were caught during the night (Table 3). No shrimp were caught during the day.

Seven bottom tows were made to compare day and night catch rates for shrimp (Table 8).

Trip four On May 28-30, two strings of pots were fished throughout one day and night. Sixty shrimp were caught at night (Table 4). No shrimp were caught during the day. Two bottom tows (Table 8) and seven midwater tows (Table 9) were made. One series of light readings was taken during the day.

Trip five During the trip June 4-5, two strings of pots were fished throughout the night and part of the day. Three shrimp were caught at night (Table 5). No shrimp were caught during the day. Three pots were lost when the attachment rings wore through the twine used to sew them on. Two additional pots, two anchors, and forty feet of chain were lost when a commercial trawler's gear cut the main line on one string.

One bottom tow was made (Table 8). Rough weather prevented us from fishing the midwater trawl.

Trip six Two strings were fished June 11-12. The strings were set and pulled at night and once during the day. Rough weather forced us into port before the strings had been fished the full 24 hours. Only one shrimp was caught during the night (Table 6).

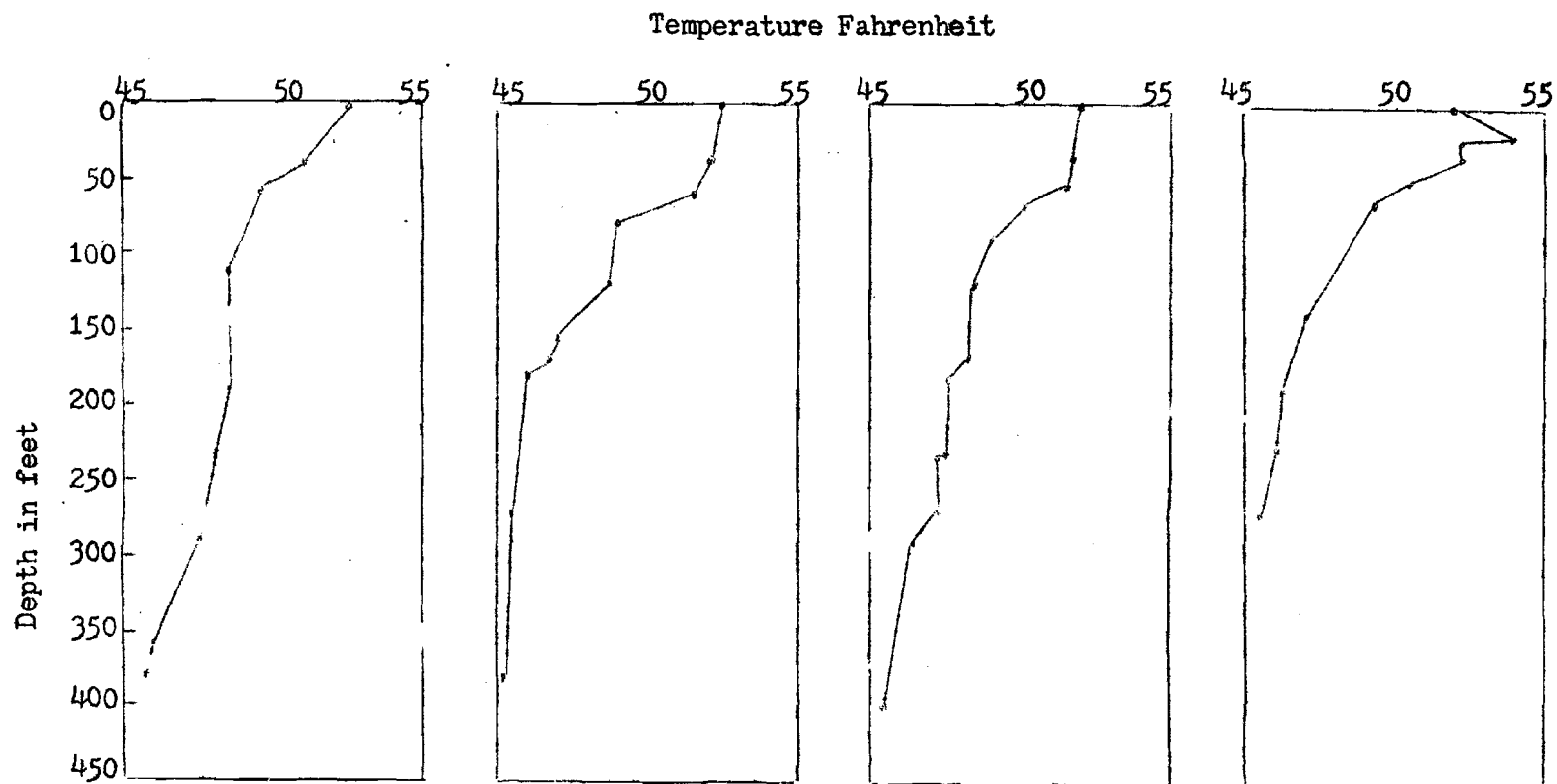
Trip seven On June 16, two strings of pots were fished throughout one day and night. Seventy-nine shrimp were caught at night (Table 7). No shrimp were caught during the day.

Two bottom tows (Table 8) and eight midwater tows (Table 9) were made.

Fifteen subsurface temperature profiles were taken with a bathythermograph (Figure 1). Fourteen bottom and fifteen surface salinity samples were also taken.

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July 18, 1968

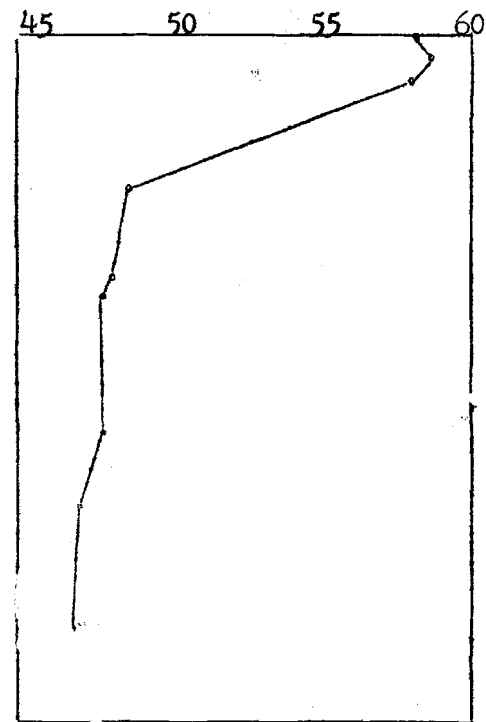
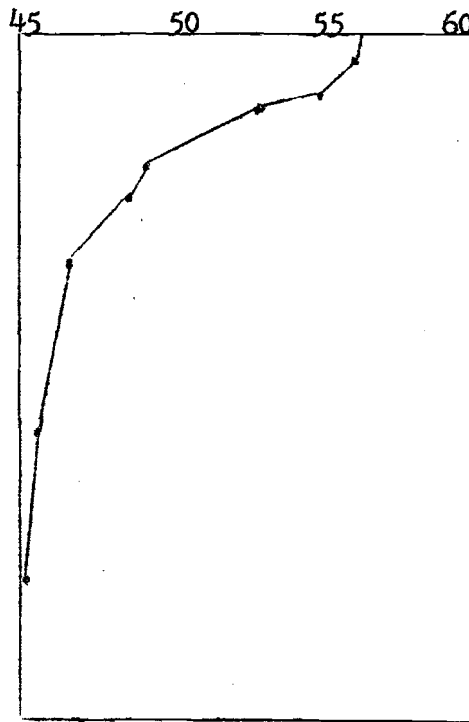
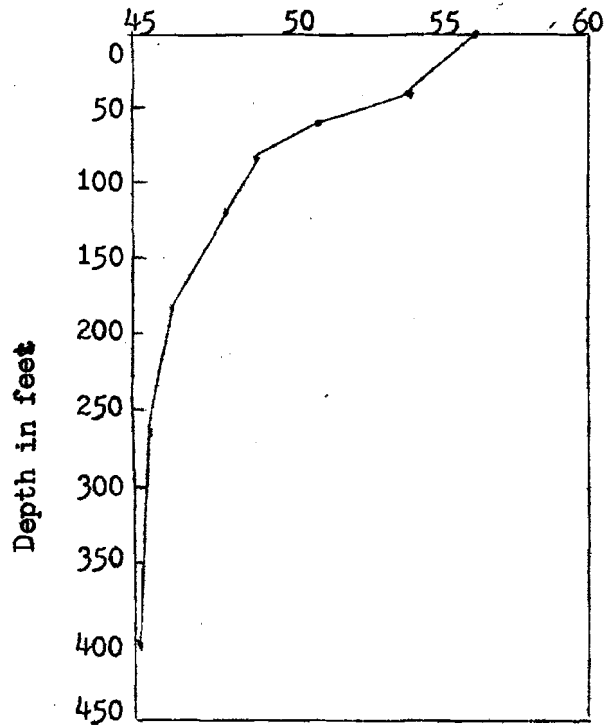


Slide No.	12	13	14	15
Time (PST)	1445	1840	1530	1500
Date	5-7-68	5-8-68	5-11-68	5-12-68
Vessel	MV Sunrise	MV Sunrise	MV Sunrise	MV Sunrise
Loran (2H4)	3268	3266	3205	3360
Depth (fms)	75	74	77	62

Figure 1. Bathythermograph traces (BT No. 3218 D) from cruise 68-5, May 7 to June 19, 1968.

7.

Temperature Fahrenheit



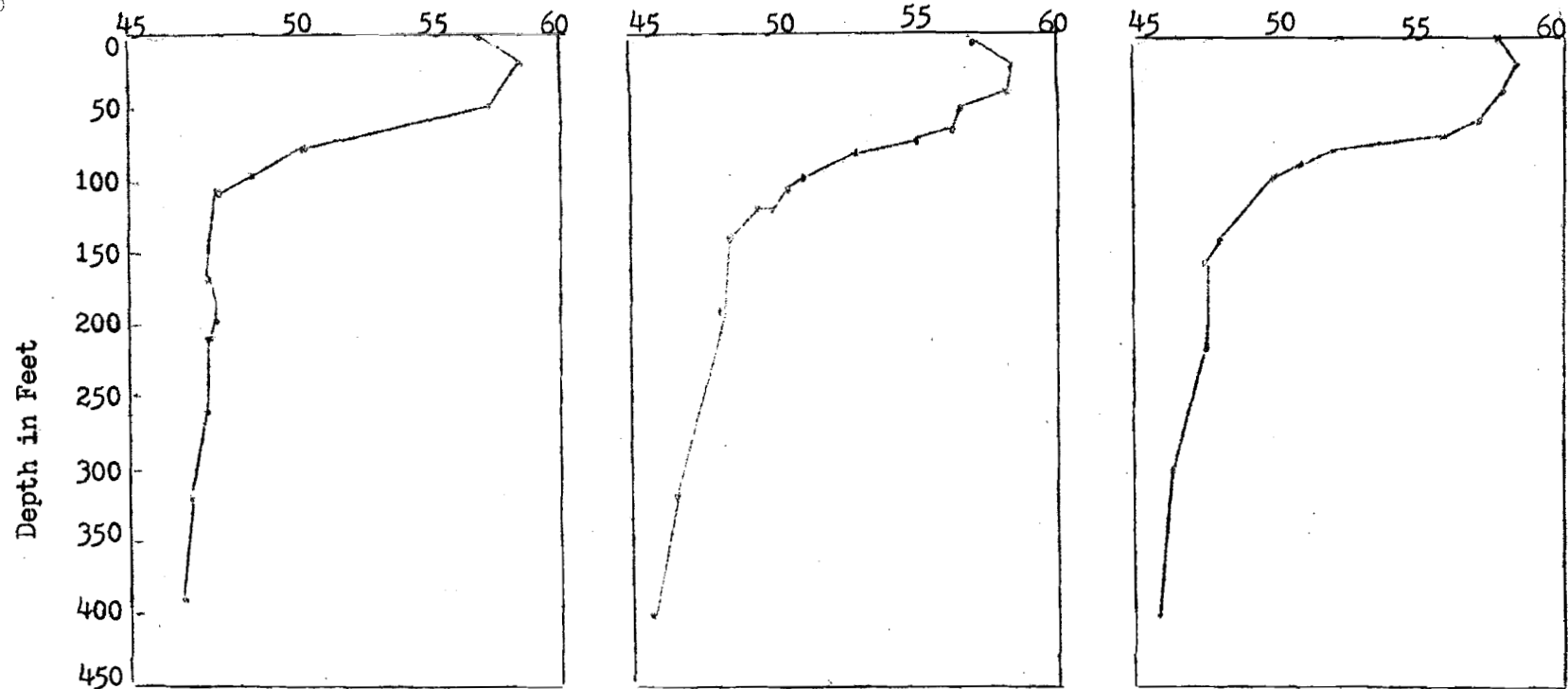
Slide No.	16
Time (PST)	1850
Date	5-18-68
Vessel	MV Sunrise
Loran (2H4)	3280
Depth (fms)	73

Slide No.	17
Time (PST)	1000
Date	5-19-68
Vessel	MV Sunrise
Loran (2H4)	3280
Depth (fms)	70

Slide No.	18
Time (PST)	1515
Date	5-28-68
Vessel	MV Sunrise
Loran (2H4)	3275
Depth (fms)	75

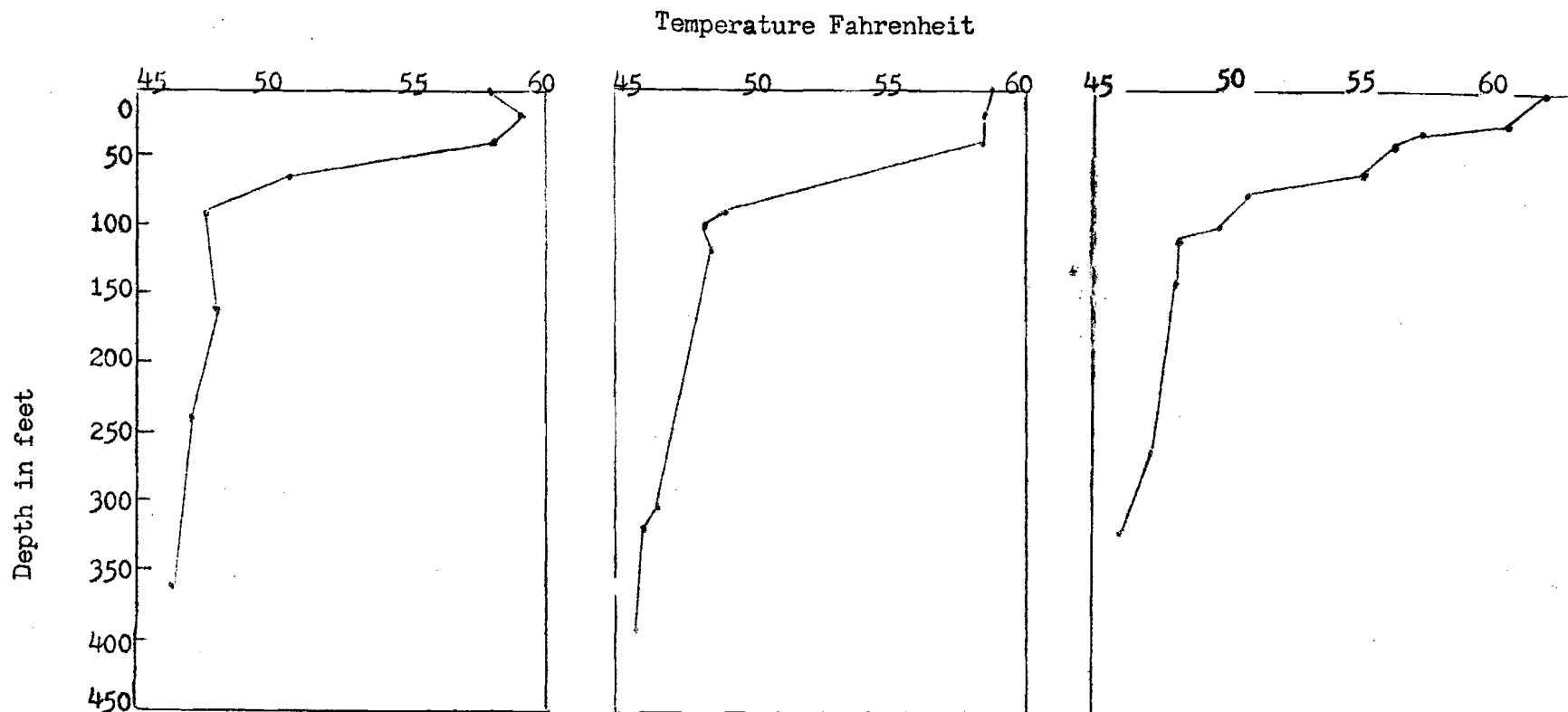
Figure 1. (Continued)

Temperature Fahrenheit



Slide No.	19	20	21
Time (PST)	1000	0140	1930
Date	5-29-68	5-30-68	6-4-68
Vessel	MV Sunrise	MV Sunrise	MV Sunrise
Loran	2H4 3275	2H4 3300	2H4 3275
Depth (fms)	70	74	72

Figure 1. (Continued)



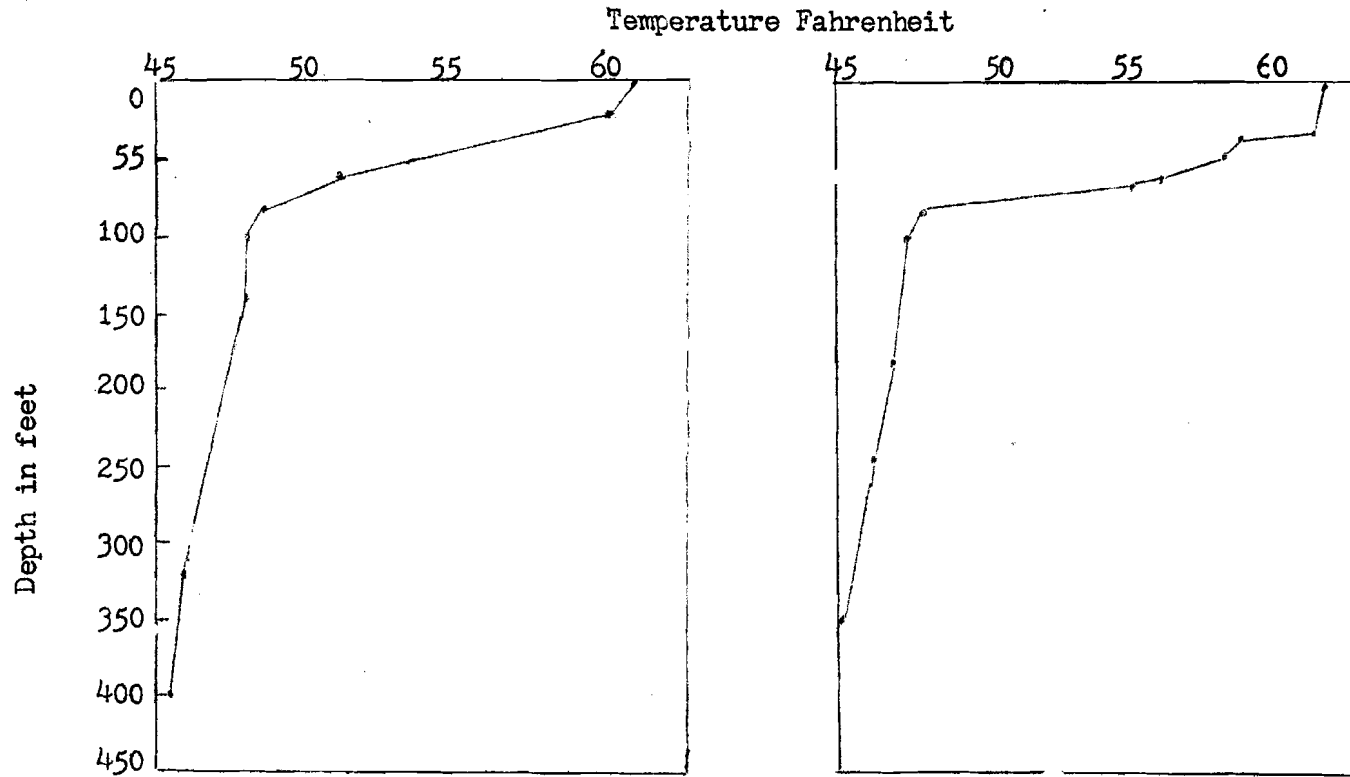
Slide No.
Time (PST)
Date
Vessel
Loran
Depth (fms)

22
1130
6-5-68
MV Sunrise
2H4 3270
69

23
1725
6-11-68
MV Sunrise
2H4 3300
75

24
2000
6-16-68
MV Sunrise
2H4 3295
73

Figure 1. (Continued)



Slide No.
Time (PST)
Date
Vessel
Loran
Depth (fms)

25
1115
6-16-68
MV Sunrise
2H4 3290
73

26
1200
6-18-68
MV Sunrise
2H4 3282
72

Figure 1. (continued)

Table 1. Pink shrimp catch by sex by pot and string
Cruise 68-5, May 7-9, 1968, trip 1.

Pot no.	Set 2			Total
	Down	2115 PST		
	Up	0500 PST		
	Elapsed 7:45			
	M	T	F	
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	1	1
12	1	0	2	3
13	0	0	0	0
14	0	0	1	1
15	0	0	0	0
16	0	1	1	2
17	0	0	0	0
Total	1	1	5	7
Loran (2H4)	3266			
Depth (fms)	73-74			

Table 2. Pink shrimp catch by sex by pot and string
Cruise 68-5, May 11-12, 1968, trip 2.

Pot no.	Set 1				Set 4				Set 5				Set 6			
	Down 1500 PST				Down 2200 PST				Down 0210 PST				Down 0145 PST			
	Up 2115 PST				Up 0130 PST				Up 0620 PST				Up 0600 PST			
	Elapsed 6:15				Elapsed 3:30				Elapsed 4:10				Elapsed 4:15			
	M	T	F	Total	M	T	F	Total	M	T	F	Total	M	T	F	Total
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1
9	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1
10	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	1	1	0	0	1	1	0	0	3	3	0	0	4	4
Loran (2H4)	3205				3205				3203				3200			
Depth (fms)	76-77				77				76				76			

Table 3. Pink shrimp catch by sex by pot and string
Cruise 68-5, May 18-20, 1968, trip 3.

Pot no.	Set 3				Set 4				Set 5			
	Down 2210 PST				Down 2230 PST				Down 0145 PST			
	Up 0130 PST				Up 0200 PST				Up 0910 PST			
	Elapsed 3:20				Elapsed 3:30				Elapsed 7:25			
	M	T	F	Total	M	T	F	Total	M	T	F	Total
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	2	2
16	0	0	1	1	0	0	2	2	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	1	1	0	0	2	2	0	0	2	2
Loran (2H4)	3280				3280				3280			
Depth (fms)	73				73				73			

Table 4. Pink shrimp catch by sex by pot and string
Cruise 68-5, May 28-30, 1968, trip 4.

Pot no.	Set 1				Set 2				Set 3				Set 4			
	Down 1830 PST				Down 1900 PST				Down 2240 PST				Down 2300 PST			
	Up 2230 PST				Up 2245 PST				Up 0215 PST				Up 0240 PST			
	Elapsed 4:00				Elapsed 3:45				Elapsed 3:35				Elapsed 3:40			
	M	T	F	Total	M	T	F	Total	M	T	F	Total	M	T	F	Total
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
10	0	0	0	0	0	0	0	0	3	0	7	10	1	0	0	1
11	0	0	0	0	0	0	0	0	0	1	4	5	11	0	4	15
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
15	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	1	0	0	1	0	0	1	1	1	2	3	6
17	0	0	0	0	0	0	0	0	0	0	0	0	2	0	6	8
Total	0	0	1	1	1	0	0	1	3	2	12	17	16	2	14	32
Loran (2H4)	3282				3282				3282				3282			
Depth (fms)	72				72				72				72			

Pot no.	Set 5				Set 6			
	Down 0230 PST				Down 0255 PST			
	Up 0835 PST				Up 0900 PST			
	Elapsed 6:05				Elapsed 6:05			
	M	T	F	Total	M	T	F	Total
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0
14	5	2	1	8	1	0	0	1
15	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0
Total	5	2	1	8	1	0	0	1
Loran (2H4)	3282				3282			
Depth (fms)	71				71			

Table 5. Pink shrimp catch by sex by pot and string
Cruise 68-5, June 4-5, 1968, trip 5.

Pot no.	Set 4			Total
	Down 0040 PST			
	Up 0445 PST			
	Elapsed 4:05			
	M	T	F	
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	Pot Lost			
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	2	2
10	0	0	0	0
11	0	0	1	1
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
Total	0	0	3	3
Loran (2H4)	3280			
Depth (fms)	71			

Table 6. Pink shrimp catch by sex by pot and string
Cruise 68-5, June 11-12, 1968, trip 6.

Pot no.	Set 1			Total
	Down 1700 PST			
	Up 0010 PST			
Elapsed 7:10				Total
M	T	F		
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	1	1
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
Total	0	0	1	1
Loran (2H4)	3300			
Depth (fms)	74			

Table 7. Pink shrimp catch by sex by pot and string
Cruise 68-5, June 16-19, 1968, trip 7

Pot no.	Set 1				Set 2				Set 3				Set 4			
	Down 0720 PST				Down 0745 PST				Down 0030 PST				Down 0055 PST			
	Up 0015 PST				Up 0040 PST				Up 0415 PST				Up 0445 PST			
	Elapsed 4:55				Elapsed 4:55				Elapsed 3:45				Elapsed 3:50			
	M	T	F	Total	M	T	F	Total	M	T	F	Total	M	T	F	Total
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	4	4	1	0	2	3	0	0	0	0	3	0	1	4
7	0	0	4	4	1	0	2	3	2	0	7	9	0	1	3	4
8	1	0	1	2	0	0	0	0	0	0	5	5	3	0	4	7
9	0	0	0	0	0	0	0	0	0	1	1	2	1	0	4	5
10	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	11
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
14	2	0	1	3	0	0	1	1	0	0	2	2	1	0	2	3
15	1	0	0	1	0	0	0	0	0	0	2	2	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	1	0	0	1	Sample lost-Approx			0	0	0	0	
									4-5 shrimp							
Total	4	0	10	14	3	0	5	8	2	1	17	20	8	2	27	37
Loran (2H4)	3295				3295				3295				3295			
Depth (fms)	73				73				73				73			

Table 8. Summary of bottom tow data, cruise 68-5.

Date	Tow no.	Loran (2M4)		Bottom depth (fms)	Time down (PST)	Tow Time (min)	Catch (lbs)	Shrimp per pound	Sample composition			Remarks
		Down	Up						% M	% T	% F	
5-8-68	1	3276	3260	73	1141	30	15	84	15.2	3.8	81.0	Day
	2	3254	3260	74-76	1307	31	45	89	17.2	12.3	70.5	"
5-11-68	1	3222	3208	77	1330	30	350	90	28.6	9.1	62.3	"
5-12-68	2	3203	3218	76	0950	30	500	95	28.9	8.9	62.2	"
	3	3282	3295	72-70	1227	28	350	104	34.1	14.3	51.6	"
	4	3308	3321	69	1329	30	500	107	43.6	12.9	43.6	"
	5-18-68	1	3290	3278	73	1529	30	350	95	35.7	7.1	57.1
5-19-68	2	3285	3300	71-70	0229	29	40	103	36.9	12.6	50.5	Night
	3	3275	3290	72	2053	28	10	90	23.4	5.6	71.0	"
	4	3290	3280	74-75	2159	30	20	87	20.0	4.3	75.7	"
	5	3290	3305	72-69	2300	30	20	88	24.0	7.0	69.0	"
	5-20-68	6	3278	3292	73-70	0912	30	175	92	26.4	5.5	68.1
	7	3280	3295	74-72	1038	30	200	99	33.6	6.0	60.4	"
5-28-68	1	3290	3275	75-76	1354	30	400	103	42.1	9.7	48.2	"
5-30-68	9	3440	3449	39-40	0640	25	0	0	0.0	0.0	0.0	Towing for small Dover
6-5-68	1	3280	3288	69	1359	18	70	102	45.0	11.5	43.5	Day
6-17-68	1	3282	3265	73	1227	30	450	93	37.6	9.4	53.0	"
	2	3263	3280	74	1331	30	450	111	43.2	6.5	50.4	"

18 Tows

Table 9. Summary of midwater tow data, cruise 68-5.

Date	Tow no.	Loran (2H4)		Bottom depth (fms)	Time down (PST)	Tow time (min)	Warp length (fms) ^{1/}	Rec. depth (fms)	Shrimp catch (lbs)	Shrimp per pound	% M	% T	% F	Fish catch (lbs)	Remarks
		Down	Up												
5-28-68	2	3280	3260	69-70	2310	30	50	--	0	0	0.0	0.0	0.0	Trace	
5-29-68	3	3255	3272	69-70	0006	30	100	--	0	0	0.0	0.0	0.0	Trace	
	4	3270	3250	70	0103	27	150	--	0	0	0.0	0.0	0.0	1	
	5	3272	3282	73	2128	30	150	15	0	0	0.0	0.0	0.0	8	
	6	3280	3270	73	2228	30	200	24	½	141	70.9	11.4	17.7	18½	
	7	3272	3282	71	2337	33	250	37	1½	128	63.1	5.7	31.2	12	
5-30-68	8	3290	3300	71-74	0046	30	100	58	0	0	0.0	0.0	0.0	16	
6-17-68	3	3230	3250	77	2344	34	100	13	Trace	132	71.4	0.0	28.6	Trace	
6-18-68	4	3248	3265	79-77	0045	30	150	22	1	155	78.2	9.0	12.8	2 ³ / ₄	
	5	3272	3282	78-76	0150	30	200	33	8	114	61.7	11.2	27.1	21½	
	6	3292	3312	75-74	0304	33	250	51	3	118	59.0	5.2	35.8	35	
	7	3232	3255	75	2111	30	300	55	1	137	84.3	6.0	9.7	44	
	8	3265	3282	74-73	2211	30	250	45	½	127	78.8	6.3	14.9	14 ³ / ₄	
	9	3298	3312	72-71	2310	29	200	34	½	132	79.4	7.9	12.7	20	
6-19-68	10	3320	3333	72	0002	29	150	19	Trace	170	95.2	0.0	4.8	14	
	15 Tows														

^{1/} Does not include 20 fathoms of bridle.