

FINAL REPORT

SEA TURTLE-POT FISHERY INTERACTION SURVEY CHESAPEAKE BAY AND COASTAL WATERS OF VIRGINIA

Submitted to:

National Marine Fisheries Service
Woods Hole, MA

From:

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ABSTRACT

Side scan sonar surveys were conducted of crab and whelk pot fishing gear in lower Chesapeake Bay and adjacent coastal waters during late May and early June 2006. Twenty-one survey days were scheduled but due to weather problems surveys were accomplished on only 17 days. Using side scan sonar, a total of 1,659 pots were scanned for entangled sea turtles. No sea turtles were detected entangled in any of the pot gear.

BACKGROUND

The National Marine Fisheries Service, Northeast Fisheries Science Center, (NMFS NEFSC) funded a study to systematically detect, record, and aid any sea turtles interacting with gear in the Virginia pot fisheries during a 21-day period from 16 May to 6 June 2006. The study area included two regions east of the Chesapeake Bay Bridge Tunnel (CBBT) and west of the CBBT. The monitoring covered selected portions of the coastal waters of Virginia and Chesapeake Bay. The VA portion of Chesapeake Bay is more than 20 nm wide for most of its extent and includes 150 nm of coastline on the eastern and western shores of Chesapeake Bay. The NEFSC issued two other contracts related to this project: one to American Underwater Search and Survey (AUSS) to provide and operate the side scan sonar, to act as team coordinator and to report on the results of the side scan sonar surveys, and the other to the Virginia Aquarium to assist with the handling of turtles if encountered in the pot fishing gear. The purpose of this report is to present the data collected in the contract awarded to DeAlteris Associates Inc. to provide a

survey vessel, divers and a data manager with regard to vessel operations and turtle interactions in support of the project. The final study area consisted of waters in the lower Chesapeake Bay south of approximately 37° 22.0' N latitude and Atlantic coastal waters (both approximately 10 miles above and below the mouth of the Chesapeake Bay to 3-5 miles offshore). The survey area was divided into six areas; four in the Bay and two in coastal waters (Figure 1). Initially, equal survey effort was to be achieved in each area. However, this design was modified after the start of the project due to the lack of pot gear in the offshore coastal waters, and the desire to maximize the number of pots scanned. Additionally, it was decided that it would be inefficient to wait until tidal currents reached slack water to send divers into the water to investigate sonar contacts indicating possible sea turtle entanglements, so as an alternative it was decided to haul pot buoys that the sonar technician identified as possible sea turtles entanglement, then to replace the pots in the original location.

METHODS

DeAlteris Associates Inc. (DAI) provided NMFS a USCG licensed captain, a field technician-data recorder, and a 27 foot, diesel powered research vessel. Prior to the start of each field day, the vessel captain consulted with the sonar technician to ascertain the preferred survey area for the next day, and to finalize plans for meeting at the survey boat at 6 AM. Prior to getting the vessel underway, the vessel captain confirmed with the sonar technician the preferred survey area and reviewed the existing weather conditions and the weather forecast for the day. The vessel captain also called the Virginia Marine Resources Commission (VMRC) Operations Station to notify the Commission where sampling would occur on that day.

The captain piloted the vessel to the proposed survey area and initiated a search for pot buoys directing the vessel along specific survey transects. Having identified a group of pots, rigged one buoy per pot, and set in groups of 5 to 50+, with a 200-300 foot spacing between pots (occasionally single pot buoys were observed, but these were not scanned), the vessel captain operated the vessel so as to allow for sonar scanning. Three side scan sonar (SSS) passes were made along each set of pot gear. Since the goal was to survey as many pot buoy as possible over as wide an area as possible, the survey crew targeted areas with high densities of pots. On occasion if a single lone pot buoy was observed, the sonar technician would decide not to side scan survey the buoy as it was not efficient to set up the sonar gear, and usually the single buoys were not marked with the required commercial markings, suggesting that it was a recreational crab pot. When the sonar operator determined that there was a target that could possibly be a sea turtle in the gear, the vessel crew would haul the pot to the surface to check for the presence of a sea turtle. A diver and backup diver (field technician and vessel captain respectively) were available to assess the target and release any entangled sea turtles, if necessary. The divers were available during all monitoring efforts and were certified and capable of diving on pot gear. All dive operations complied with established safety procedures. DAI personnel were trained to handle sea turtles using safe turtle handling protocols imparted at a training session conducted by Virginia Aquarium staff. To comply with data requests, the DAI data recorder entered all data electronically at the end of each day, and submitted files daily to Dr. Heather Haas, NMFS/NEFSC. At the end of the project, all hand written field data sheets were verified against the electronic files.

RESULTS

A summary of the daily project reports is presented in Table 1, and the data collected on each survey day are presented in Appendix 1 (and have also been separately provided in an EXCEL electronic file). The field study was commenced after sea turtles began entering Chesapeake Bay, as a stranded sea turtle was observed by the Virginia Aquarium on 12 May 2006, and a single live loggerhead sea turtle was observed swimming on the surface on the first day of operations, 16 May 2006. The first field day was primarily devoted to verification of the sonar technician's ability to detect sea turtles in the line (a more complete description of the sonar verification can be found in the AUSS report for the project). Of the 20 days initially scheduled for field work, the weather and rough seas prevented survey and side scan sonar scanning on six days. Of the rough weather days, only one day was considered unsafe for vessel operation; on the remaining five days the sonar technician determined that vessel motion in the seaway would be too great for reliable sonar operations and sea turtle identification. One day was added to the original schedule to make-up for first four of the bad weather days. During the pot buoy survey transects, the field personnel estimated that it was possible to detect buoys at a distance of approximately 600 feet on a rough day and 1500+ feet on a calm day. This was based on estimated pot spacing of 300 feet between pot buoys in a line. The survey vessel crew hauled pots at the request of the sonar technician at least once each day, so as to check for possible sonar contacts, however a sea turtle was never found and possible contacts were usually related to a small donut buoy in the hauling line above the pot (a complete discussion of the results of the sonar survey is available in the AUSS report for the project). A total of 1659 pots were scanned during the study, and no sea turtles were found entangled in any of the pot gear.

DISCUSSION

Rough seas due to storms were a significant problem during the initial 20-day observation period, resulting in a loss of six days of survey and scanning work. While this loss is regrettable, it is not unexpected given the large, open area being surveyed and a spring season characterized by frequent frontal passages with associated winds. A larger vessel (40-50 feet) might have offered greater stability in rough weather, resulting in less lost days; however, such a vessel would probably have had substantially slower transit speed resulting in less area covered each operational day and a greater daily expense.

In the first part of the study period, considerable time was devoted to identifying areas having concentrations of crab pots while the second portion of the study was devoted to scanning large numbers of pot buoys in the identified areas. Two days were devoted to surveying for whelk buoys offshore of the Chesapeake Bay Bridge Tunnel and north and south of the Chesapeake Bay mouth - but only a few whelk buoys were detected. Gillnets were observed deployed 1-2 miles off the barrier islands of the Eastern Shore, fishing from surface to bottom. Gillnets were also observed on the shoulders of the Baltimore Channel and the deep natural channel on the eastern side of the Bay. In my opinion, gillnets, especially nets fishing over the entire water column are a more likely cause of sea turtle entanglement than pot buoys based on projected area in the water column, and should be investigated using side scan sonar in the future.

Figure 1. Map of lower Chesapeake Bay showing the survey areas in red boxes. Small purple numbers are codes for state fishing areas.

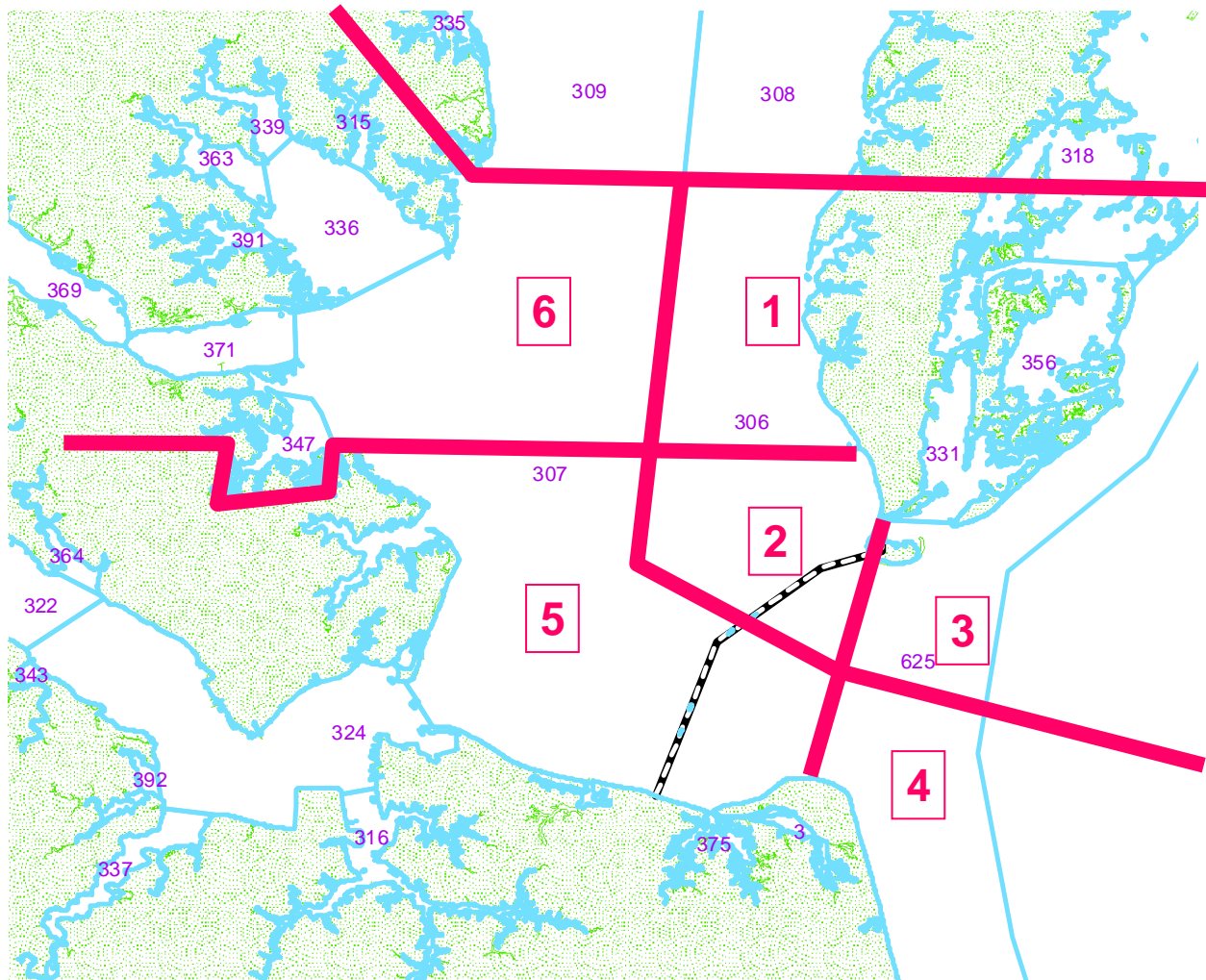


Table 1

CHESAPEAKE BAY SEA TURTLE - POT FISHERY SURVEY IN 2006

SUMMARY OF DAILY REPORTS

DATE	HOURS ON WATER	SURVEY AREA	NUMBER OF SURVEY TRACK LINES	NUMBER OF SONAR TRACK LINES	NUMBER OF POTS SONAR SCANNED	ESTIMATED PERCENT OF POTS OBSERVED SCANNED	NUMBER OF SEA TURTLE INTACT.	NOTES
15-May								mobilization
16-May	0.0							training at VA
17-May	10.0	1	2	2	3		0	sonar calibration
18-May	7.7	1 and 2	4	9	94	90	0	windy, rough, partial coverage areas 1 and 2
19-May	2.2	1	3	0	0		0	too rough to survey or SSS
20-May	4.3	1 and 6	4	0	0	0	0	too rough to SSS in area 1, cross bay to area 6, still too rough on lee shore, need better weather to SSS
21-May	9.0	5	10	8	106	20	0	good weather, comprehensive spatial coverage of area 5
22-May	0.0	-	0	0	0		0	very bad weather, 20-30 NW, estimated 4-6 foot sea, unsafe to operate
23-May	7.0	1	4	3	23	50	0	very rough, good spatial coverage of NW area 1
24-May	9.3	6	7	9	160	20	0	rough in morning, good weather in afternoon
25-May	9.0	3 and 2	5	5	55	25	0	good weather in morning, comprehensive spatial coverage of area 3, no pots observed, SSS in area 2 on way back.
26-May	0.0	-	0	0	0		0	too rough to survey or SSS
27-May	9.6	5 and 6	5	6	167	40	0	good weather in morning, comprehensive spatial coverage of York River in area 6, and also along Balt. channel
28-May	9.0	4 and 5	4	7	69	35	0	great weather, good spatial coverage area 4, only 2 whelk pots, resurvey area 5 east of Lynnhaven Inlet.
29-May	9.0	5	6	9	106	35	0	great weather, resurvey of east and west sides of Lynnhaven Inlet channel

30-May	9.5	5 and 1	6	7	126	50	0	great weather, resurvey area 1 off Norfolk and Buckroe Beach, then area 1 along Balt. Channel
31-May	9.0	1	5	3	117	100	0	dense fog west side of bay, alternate plan area 1, SSS in deep water along Balt. Channel
1-Jun	8.0	1 and 2	0	13	152	95	0	good weather, SSS pots north and south of Kiptopeake Beach
2-Jun	2.0	-	0	0	0	0	0	too rough to SSS
3-Jun	0.0	-	0	0	0	0	0	too rough to SSS
4-Jun	9.3	6 and 1	4	7	165	50	0	great weather, resurvey New Point Comfort in area 6, new survey and scan offshore Cherrystone Channel.
5-Jun	8.3	2 and 1	0	9	167	67	0	rain, resurvey north and south of Kiptopeake Beach
6-Jun	7.0	2	0	4	149	67	0	make-up day for 4 of 6 bad weather days, end early due to rough sea and unable to SSS
Total	139.2		69	101	1659			

APPENDIX 1

CHESAPEAKE BAY SEA TURTLE - POT FISHERIES INTERACTION SURVEY IN 2006: Track Line Data: Survey or Sonar

Date: 18-May-06 Area: 1 and 2

Wind Speed: 15 to 25 Wind direction: SW Wave height: 1-3 feet

Type	Begin Time	Begin Lat	Begin Long	End Time	End Lat	End Long	Notes
	700						arrive
	0730						depart dock
	0735			0835			transit from CC Harbor to south toward Cape Charles
SSS	0839	37 07.298	75 58.901	0900	37 08.260	75 58.785	21 pots, Area 2
SSS	0916	37 07.292	75 58.678	0937	37 07.698	75 58.711	12 pots, Area 2
SSS	1018	37 09.774	75 59.329	1032	37 10.065	75 59.449	10 pots in Kiptopeake Harbor, Area 2
SSS	1034	37 10.076	75 59.493	1052	37 10.307	75 50.511	8 pots in Kiptopeake Harbor, Area 2
SSS	1056	37 10.093	75 59.473	1124	37 09.814	75 59.298	15 pots in Kiptopeake Harbor, Area 2
survey	1134	37 09.524	75 59.474	1204	37 08.140	76 03.972	east to west
survey	1205	37 08.140	76 03.931	1217	37 06.859	76 03.637	north to south
survey	1218	37 06.864	76 03.637	1246	37 08.287	76 59.059	west to east
survey	1246	37 08.287	76 59.059	1345	37 14.503	76 02.108	south to north, to CC Harbor
SSS	1307	37 10.489	76 00.020	1311	37 10.456	75 59.991	1 pot, Area 1
SSS	1359	37 14.235	76 01.937	1418	37 14.629	76 02.031	10 pots, Area 1
SSS	1419	37 14.618	76 02.014	1429	37 14.855	76 02.002	7 pots, Area 1
SSS	1440	37 14.634	76 01.929	1455	37 14.976	76 01.892	10 pots, Area 1
	1510						return to dock
	1530						leave

CHESAPEAKE BAY SEA TURTLE - POT FISHERIES INTERACTION SURVEY IN 2006: Track Line Data: Survey or Sonar

Date: 23-May-06 Area: 1

Wind Speed: 20 to 10 Wind direction: North Wave height: early morning 3-5 feet, occasional 6 foot late morning and afternoon 2-4 feet

Type	Begin Time	Begin Lat	Begin Long	End Time	End Lat	End Long	Notes
	0600						arrive dock
	0615						underway
	0720						return to dock, too rough to safely operate, reached deep channel, attempting to go to area 6
	1035						underway, second attempt, after tide change, and diminished wind
survey	1100	37 13.950	76 03.010	1237	37 21.647	76 04.461	north to north boundary of area 1, buoy 40, many gillnets in NW area 1
survey	1240	37 21.624	76 04.457	1440	37 20.521	76 01.103	east to shoal water
SSS	1245	37 21.409	76 04.065	1339	37 21.840	76 03.986	12 pots, N-S line, very strong ebb current
SSS	1342	37 21.881	76 04.057	1351	37 21.871	76 04.047	3 pot cluster
SSS	1358	37 21.914	76 03.826	1416	37 21.525	71 03.867	8 pots, N-S line
survey	1440	37 22.521	76 01.103	1540	37 14.342	76 03.944	SW to Old Plantation Flats
survey	1540	37 14.342	76 03.944	1600	37 13.950	76 03.010	west to entrance channel buoy
	1645						return dock
	1700						leave dock

CHESAPEAKE BAY SEA TURTLE - POT FISHERIES INTERACTION SURVEY IN 2006: Track Line Data: Survey or Sonar

Date: 26-May-06 Area: NA

Wind Speed: 15-30 Wind direction: SW-W Wave height: 3-5 feet

Type	Begin Time	Begin Lat	Begin Long	End Time	End Lat	End Long	Notes
	0600						arrive dock
	0615						conclude that it is too rough to survey or SSS
	0900						leave dock

CHESAPEAKE BAY SEA TURTLE - POT FISHERIES INTERACTION SURVEY IN 2006: Track Line Data: Survey or Sonar

Date: 29-May-06 Area: 5

Wind Speed: calm to 5 kts Wind direction: E-SE Wave height: 1 foot

Type	Begin Time	Begin Lat	Begin Long	End Time	End Lat	End Long	Notes
	0600						arrive dock
	0615						underway to area 5, resurvey east and west of Lynnhaven Inlet
survey	0715	37 04.352	76 10.011	0815	36 58.076	76 06.580	enter area 5, to south island CBBT
survey	0825	36 58.075	76 06.580	0840	36 54.970	76 05.727	south island to Lynnhaven Inlet channel
SSS	0840	36 54.970	76 05.727	0910	36 55.116	76 06.585	17 pots, 25% of those present
survey	0910	36 54.116	76 06.583	0945	36 55.930	76 09.045	to west and Little creek channel
survey	0945	36 55.930	76 09.045	1002	36 58.070	76 06.586	north to Thimble Shoal channel and south island CBBT
survey	1002	36 58.070	76 06.586	1024	36 55.630	76 03.081	southeast to Cape Henry
SSS	1024	36 55.630	76 03.081	1036	36 55.461	76 03.281	8 pots
SSS	1045	36 55.581	76 03.011	1056	36 55.358	76 03.263	11 pots
SSS	1057	36 55.355	76 02.281	1111	36 55.573	76 02.970	13 pots, last 3 SSS transects, 50% of those present
SSS	1123	36 55.403	76 03.342	1142	36 55.175	76 03.814	14 pots
SSS	1149	36 55.357	76 03.294	1215	36 55.148	76 03.790	11 pots , last 2 SSS transects, 25% of those present
SSS	1220	36 55.200	76 03.874	1240	36 55.071	76 04.285	12 pots
SSS	1242	36 55.162	76 03.890	1258	36 55.047	76 04.275	11 pots
SSS	1305	36 55.131	76 03.850	1320	36 55.059	76 04.180	9 pots, last 3 SSS 50% of pots present
survey	1320	36 55.059	76 04.180	1415	37 02.510	76 05.126	exit area 5
	1515						return to dock
	1600						depart dock

CHESAPEAKE BAY SEA TURTLE - POT FISHERIES INTERACTION SURVEY IN 2006: Track Line Data: Survey or Sonar

Date: 30-May-06 Area: 5 and 1

Wind Speed: 5 to 10 Wind direction: SW Wave height: 1 foot

Type	Begin Time	Begin Lat	Begin Long	End Time	End Lat	End Long	Notes
	0600						arrive dock
	0615						underway for area 5
survey	0725	37 04.237	76 09.463	0803	36 56.340	76 11.343	enter area 5, SSW to west side of Little Creek channel
survey	0820	36 56.303	76 11.260	0825	36 58.210	76 16.100	NW along shore to Willoughby spit
survey	0855	36 58.210	76 16.101	0917	37 01.047	76 14.531	NE to Thimble Shoal light
survey	0917	37 01.047	76 14.521	0938	37 02.319	76 17.012	NW to Buckroe Beach
SSS	0938	37 02.301	76 17.223	1016	37 03.012	76 16.927	20 pots
SSS	1017	37 02.976	76 16.922	1050	37 02.298	76 17.233	20 pots
SSS	1051	37 02.353	76 17.148	1110	37 02.737	76 17.005	9 pots, last 3 transects, 50% of those present
SSS	1136	37 03.044	76 16.811	1203	37 03.608	76 16.588	18 pots
SSS	1203	37 03.653	76 16.518	1238	37 02.996	76 16.810	20 pots
SSS	1205	37 03.041	76 16.728	1300	37 03.478	76 16.545	12 pots, last 3 transects 50% of those present
survey	1300	37 03.478	76 16.545	1340	37 09.981	76 09.904	N to Baltimore Channel
survey	1340	37 09.981	76 09.901	1416	36 16.706	76 07.360	along Baltimore Channel, into area 1
SSS	1416	36 16.706	76 07.360	1506	37 17.782	76 07.060	25 pots, along west side of Balt Channel, 50 % of those present
	1545						return to dock
	1615						leave dock

CHESAPEAKE BAY SEA TURTLE - POT FISHERIES INTERACTION SURVEY IN 2006: Track Line Data: Survey or Sonar

Date: 31-May-06 Area: 1

Wind Speed: 5 to 10 Wind direction: SE Wave height: 1-2 feet

Type	Begin Time	Begin Lat	Begin Long	End Time	End Lat	End Long	Notes
	0615						arrive at dock
	0650						underway for area 6, mouth of York River
survey	0733	37 14.117	76 08.300	0755	37 12.974	76 10.132	enter area 6, buoys 33-34, SW to York River, then encounter dense fog, and decided to return to east
survey	0755	37 12.974	76 10.132	0905	37 17.566	76 06.703	proceed up Balt Channel to NNE
SSS	0905	37 17.566	76 06.707	1011	37 16.289	76 07.163	29 pots, east side of channel in deep water, 65 feet
SSS	1025	37 16.684	76 07.374	1211	37 18.978	76 07.072	51 pots, west side of channel in deep water, 45 feet
SSS	1221	37 17.545	76 06.683	1249	37 18.006	76 06.429	10 pots, east side of channel
survey	1247	37 18.006	76 06.429	1323	37 21.922	76 02.970	NE to north boundary of area 1
survey	1323	37 21.922	76 02.970	1336	37 21.836	76 00.846	E to shore and shallow water
survey	1336	37 21.836	76 00.846	1434	37 14.159	76 02.406	south to Cherrystone Channel
SSS	1447	37 13.945	76 01.990	1536	37 14.945	70 01.971	27 pots, east side of Cherrystone Channel
	1555						return to dock
	1630						leave dock

CHESAPEAKE BAY SEA TURTLE - POT FISHERIES INTERACTION SURVEY IN 2006: Track Line Data: Survey or Sonar

Date: 1-Jun-06 Area: 2

Wind Speed: 15-May Wind direction: SE-SW Wave height: 1-2 feet

Type	Begin Time	Begin Lat	Begin Long	End Time	End Lat	End Long	Notes
	0600						arrive dock
	0630						underway to area 1
SSS	0712	37 10.241	75 59.692	0817	37 10.907	76 00.372	20 pots, north of Kiptopeake ships
SSS	0821	37 11.049	76 00.482	0905	37 10.284	75 59.719	26 pots, north of Kiptopeake ships, 100% of those present
SSS	0910	37 10.119	75 59.504	0925	37 10.357	75 59.589	7 pots, too shallow to continue, 50% of those present
SSS	0938	37 10.266	75 59.494	0949	37 10.093	75 59.457	6 pots
SSS	0952	37 10.111	75 59.441	1025	37 09.843	75 59.349	9 pots
SSS	1020	37 10.072	75 59.393	1040	37 09.845	75 59.268	10 pots
SSS	1050	37 09.121	75 59.036	1117	37 08.680	75 58.840	13 pots
SSS	1118	37 08.711	75 58.817	1139	37 08.277	75 58.768	12 pots
SSS	1140	37 08.308	75 08.862	1153	37 08.497	75 58.864	6 pots
SSS	1155	37 08.627	75 58.826	1212	37 08.322	75 58.825	9 pots
SSS	1213	37 08.325	75 58.719	1242	37 08.999	75 58.816	15 pots
SSS	1245	37 08.990	75 58.747	1317	37 08.385	75 58.639	19 pots
SSS	1320	37 09.225	75 59.013	1331	37 09.165	75 59.192	offshore pound net with experimental leader
	1435						return to dock
	1500						leave dock

