

Marine Debris Survey in Virginia

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Introduction

This project demonstrates the feasibility of using side scan sonar surveys to locate abandoned or “ghost” fishing gear, particularly crab pots, in the Virginia tidal waters of the Chesapeake Bay. In addition, the project involves analysis of existing ghost pot data retrieved from Chesapeake Bay Multispecies Monitoring and Assessment Program (ChesMMAAP) trawl surveys and an investigation of the potential effect of ghost pots on fish communities in Virginia waters.

This report covers Task 1 and Task 2 of the project. The project was divided into a number of tasks that called for development and testing of the detection methodology using side scan sonar at the outset. This would be followed by a larger scale effort that will produce a map of the surveyed area annotated with the location of all identifiable fishing gear detected by the side scan survey. Another task in the project involves organizing and summarizing the limited data on ghost pots retrieved through the ChesMMAAP surveys.

Tasks 1 and 2

The first objective was to conduct preliminary side scan sonar surveys in a pilot study area of the York River to locate crab pots and distinguish buoyed from non-buoyed pots. These surveys were conducted with two boats, one boat collecting side scan imagery, and the second collecting GPS locations for all visible buoys. Upcoming surveys, which will occur during the closure period for crab potting, will be compared with the initial surveys to confirm that the unbouyed pots are indeed “ghost” pots.

Figure 1 depicts the location of the two initial side scan sonar trials in the York River conducted near the end of crabbing season (early-November). The Sarah’s Creek survey (approximately 50 acres) resulted in the location of 53 pots, 32 with buoys and 21 non-buoyed ghost pots. The Sarah’s Creek site was ground-truthed by returning to GPS marked ghost pots and retrieving two of the marked items. Both side scan surveyed targets were ghost pots containing a whelk, four oyster toadfish, a white perch, and the remains of six blue crabs (approximately 4 kilograms in total). Figure 1 shows the York River test sites (approximately 2400 acres) depicting ghost crab pots (red) and buoyed crab pots (green). The York River test site had 288 potential ghost pots out of 590 total pots.

A second objective of the project was to examine existing ghost pot data retrieved from Chesapeake Bay Multispecies Monitoring and Assessment Program (ChesMMAAP) trawl surveys as the only currently available information on the potential effect of ghost pots on fish communities in Virginia waters. Since 2002, ChesMMAAP has attempted to sample 90 stations in the mainstem Chesapeake Bay ranging from the southern edge of the Susquehanna Flats to the Bay mouth in all depths to a minimum of 10 feet during each cruise. There are approximately 4-

5 cruises per year and a large mesh bottom trawl is used to capture adult fish of a variety of species. During this sampling time frame (2002-2005), when abandoned or “ghost” crab pots were inadvertently dredged up with the trawl, observations on fish and shellfish species trapped within were made.

During ChesMMAP surveys from 2002-2005, ghost crab pots were obtained at 28 stations. Catches within the crab pots were predominately blue crabs (*Callinectes sapidus*) at 32.1% of the total catch. Species accounting for greater than 97% of the total catch were in order of abundance: blue crab (*Callinectes sapidus*, 32.1%), oyster toadfish (*Opsanus tau*, 27.2%), Atlantic croaker (*Micropogonias undulatus*, 9.3%), spot (*Leiostomus xanthurus*, 9.3%), scup (*Stenotomus chrysops*, 8.0%), white perch (*Morone americana*, 4.9%), black seabass (*Centropristis striata*, 2.5%), pigfish (*Orthopristis chrysoptera*, 1.9%), and redhake (*Urophycis chuss*, 1.2%), and striped bass (*Morone saxatilis*, 1.2%). Other species occurring in lower abundance were Atlantic spadefish (*Chaetodipterus faber*, 0.6%), feather blenny (*Hypsoblennius hentzi*, 0.6%) and summer flounder (*Paralichthys dentatus*, 0.6%) (Table 1). The average length of fish and shellfish captured in ghost pots was 188.67 mm, including both juvenile and adult life stages of blue crab.

Ongoing Objective

The third task was initiated in November 2005 to be completed in approximately 5 months. The primary objective of this task is to investigate the fishing potential of ghost pots. A secondary objective is to document encrusting/decomposition rate of test pots to estimate the length of time they might continue to effectively fish. To address these objectives, we deployed seven experimental ghost pots in each of four locations in the York River Watershed. One week per month, the pots are actively fishing, the remaining three weeks per month the pots are closed, but remain in the water to simulate degradation/encrustation. Trapped organisms are identified and measured every other day during the week the pots are actively fishing. At the end of the experiment, the population of organisms trapped over the course of the experiment and the degradation of pots will be analyzed.

Table 1. Abandoned crab pot catches from ChesMMAF trawl survey data (2002-2005).

Common Name	Latin Name	Total Abundance	Average Length	Proportion of Catch
Oyster toadfish	<i>Opsanus tau</i>	44	263.70	27.2
Blue crab, male	<i>Callinectes sapidus</i>	30	143.00	18.5
Blue crab, adult female	<i>Callinectes sapidus</i>	21	144.14	13.0
Atlantic croaker	<i>Micropogonias undulatus</i>	15	316.13	9.3
Spot	<i>Leiostomus xanthurus</i>	15	209.60	9.3
Scup	<i>Stenotomus chrysops</i>	13	161.15	8.0
White perch	<i>Morone americana</i>	8	210.88	4.9
Black seabass	<i>Centropristis striata</i>	4	202.25	2.5
Pigfish	<i>Orthopristis chrysoptera</i>	3	181.33	1.9
Red hake	<i>Urophycis chuss</i>	2	246.50	1.2
Striped bass	<i>Morone saxatilis</i>	2	264.00	1.2
Atlantic spadefish	<i>Chaetodipterus faber</i>	1	100.00	0.6
Blue crab, juvenile female	<i>Callinectes sapidus</i>	1	53.00	0.6
Bluefish	<i>Pomatomus saltatrix</i>	1	251.00	0.6
Feather blenny	<i>Hypsoblennius hentzi</i>	1	60.00	0.6
Summer flounder	<i>Paralichthys dentatus</i>	1	212.00	0.6

Summary Numbers	
Average Length (mm) of fish in pots	202.30
Average Length (mm) of blue crabs in pots	113.38
Average Length (mm) of all species in pots	188.67
Total number of animals in pots (2002-05)	162
Proportion of catch = blue crabs	32.1

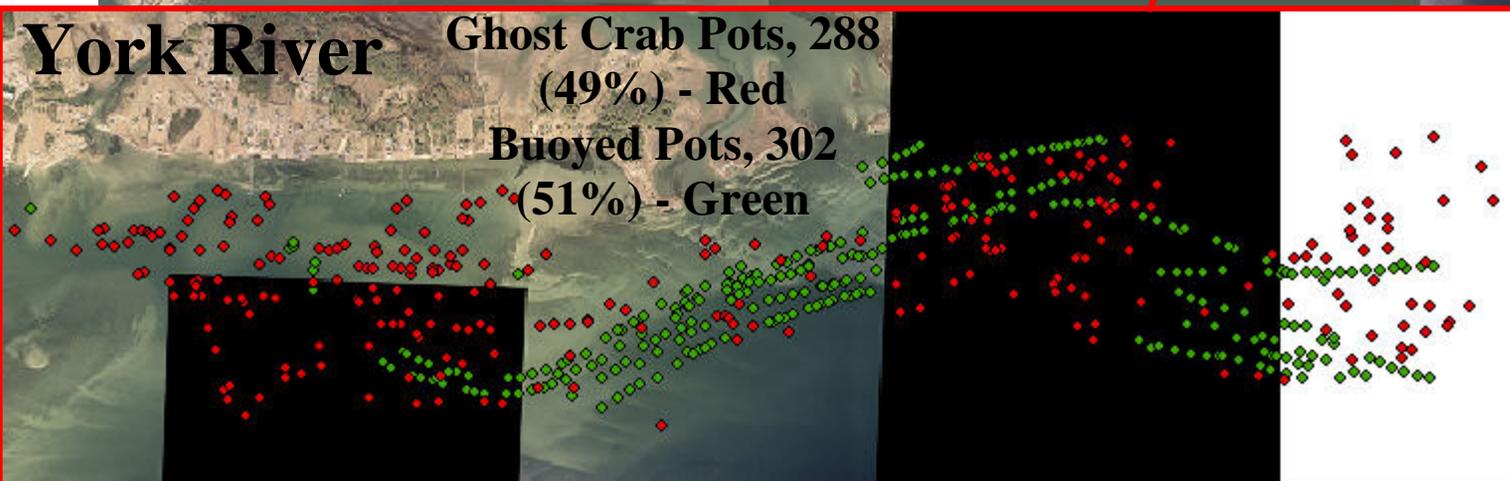
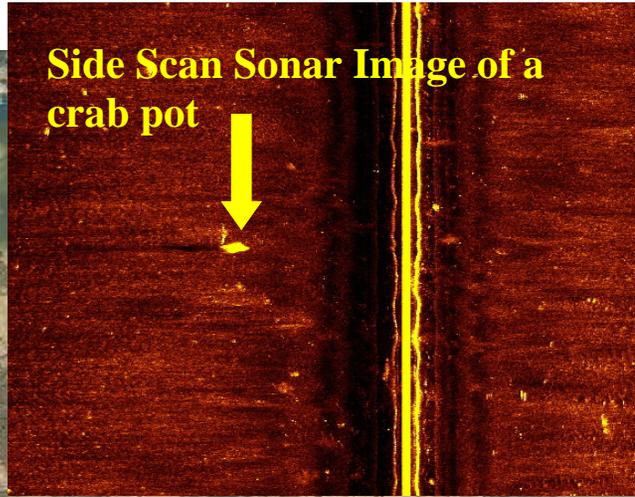


Figure 1.
 Buoyed and ghost crab pots in the lower York River.
 Aerial imagery 2002
 Commonwealth of Virginia