National Fish and Wildlife Foundation
Final Programmatic Report

Project Name and Number: Affects of Ghost Crab Pots in the Chesapeake (VA) (2006-0001-010)

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1) Summary
The project resulted in an assessment of derelict blue crab trap catch efficiency and mortality rates. Traps in high salinity areas become less efficient in trapping organisms after 2 years. Traps in brackish areas remain efficient in trapping organisms beyond two years. Once crabs enter the top chamber of a trap, escape rates drop significantly and mortality over time is high.

2) Introduction
Derelict "ghost" crab pots are those blue crab pots lost either through accident (cutting of the buoy float line by boat propellers), storm events, or abandoned. These pots continue to capture blue crabs as well as other marine organisms. The continued fishing of these pots can have a significant impact on the recreational and commercial blue crab fishery and the economy of local communities. For example, the Gulf States Marine Fisheries Commission has estimated blue crab ghost fishery losses as high as 4 to 10 million crabs a year in Louisiana.

Preliminary results of pilot surveys funded by the Marine Debris Program in 2005 successfully demonstrated the feasibility of using side scan sonar and bathymetric surveys to identify and geospatially position derelict crab pots in the Maryland and Virginia portions of the Bay. Preliminary estimates of derelict trap densities for the surveyed portions of the York River, Va. range from 20 to 30 traps/km^2 and near the South River of Maryland pot density exceeds 120 traps/km^2.

This project will investigate blue crab mortality rates associated with ghost pots in the Chesapeake Bay including the 'self-baiting' phenomenon of derelict traps.

Objectives
1. Quantify the biological impacts of marine debris (ghost crab pots) on marine species.

2. Educate local communities on the detriments associated with abandoned or lost crab pots.
3. Demonstrate the transferability of the project methodology to other coastal communities.

3) Methods

The use of side scan sonar surveys has been shown to be a reliable methodology for locating and identifying derelict crab pots. This project used side scan sonar to survey for derelict traps. Identified traps were removed, aged, and the contents cataloged. In a field investigation, two sites were established with 7 traps each of two ages (1 year and 2 year old) for a total of 14 traps per site. Crabs were captured, measured, tagged, and returned to the traps and monitored over time. The experiment was replicated. In addition, a sub-sample of traps was identified and an underwater camera lowered to survey the traps contents. A laboratory experiment investigated blue crab escape potential from traps of various ages. Three traps of four categories (new (control), 1 year old, 2 year old, high salinity derelict) were seeded with 6 crabs each (three female and three male) in the lower chamber. Crabs were tagged and tracked daily to determine escape efficiency and mortality rates. To test the self-baiting phenomenon we compared catch rates between un-baited and baited traps. Fourteen traps of two age classes (6 months and 11 months) were deployed in two locations for September and October. Seven traps at each site were baited by placing a dead Atlantic croaker in the upper chamber to simulate the capture of a fish by a derelict trap while the other seven traps were left unbaited. After 5 days all traps were checked and the entrapped organisms identified, measured, and released.

4) Results

a) Outputs

Fig. 1: Logic framework table with indicators. *For additional guidance and examples, see http://www.nfwf.org/evaluation/ .*

Activities	Short-Term Outputs	Long-Term Outcomes	Indicator	Baseline Value	Predicted Value of Project Output	Actual Value of Project Output
Scan, identify, and locate a sample population of ghost traps. Remove traps, catalog contents, return subsample of traps to site for continued study.	Quantify mortality rate.	Inform resource managers.	# crabs/ pot/season	Unknown	To be determined	
Scan, identify, and locate a series of ghost traps of different ages. Observe contents over a time series with minimal disturbance.	Quantify/refine mortality rates by limiting trap disturbance	Inform resource managers.	%/trap age/time	Unknown	To be determined	33% after XXX hrs. Escape rate from trap =

Scan, identify, locate, and retrieve a sample of different aged ghost traps and relocate to laboratory. Seed traps with live crabs and observe escape rates.	Determine blue crab ghost trap escape rates relative to aged traps. Refine mortality rates using escape rate data.	Inform resource managers.	%/trap/time	Unknown	To be determined	Escape rate from lower chamber = Escape rate from upper chamber = Escape rate from trap = Escape rate from lower chamber = Escape rate from upper chamber =

b) Post-project Outcomes

Significant post-project outcomes involve presentations of the data to various groups, including a report to the Virginia General Assembly. A second project (gear modifications to blue crab traps) funded through NFWF will provide opportunities to enhance outcomes from this project.

5) Discussion & Adaptive Management

a) Lessons Learned and Transferability

The key lessons learned from this project are listed below:
1. Derelict blue crab traps continue to effectively capture marine species for up to two years.
2. Crab escape rates vary by trap chamber position.
3. Mortality rates for crabs in the traps upper chamber are high after 7 days.

The next step involves design of gear modifications that reduce a derelict traps capture efficiency while not resulting in an economic hardship to commercial watermen.

b) Dissemination

Information from this project will be provided to the Virginia General Assembly in a report to address House/Senate Joint Resolution 650. The results will be submitted for peer-review publication in an appropriate scientific journal. Presentations will be made to

regulatory personnel. The report will be posted on the Virginia Institute of Marine Science, Center for Coastal Resources Management website (hit rate XXx)

c) NFWF Adaptive Management

Consider relaxing the one to one match for academic institutions to allow for more comprehensive studies (economy of scale for universities).

6) References

    i) Attach a list of secondary references used in conducting the project, including the evaluation.

POSTING OF FINAL REPORT: *This report may be shared by the Foundation and any Funding Source for the Project via their respective websites. In the event that the Recipient intends to claim that its Final Report contains material that does not have to be posted on such websites because it is protected from disclosure by statutory or regulatory provisions, the Recipient shall so notify the Foundation and the Funding Source and clearly mark all such potentially protected materials as "PROTECTED," providing an accurate and complete citation to the statutory or regulatory source for such protection.*

Approved: _____ Date: _____
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