REPORT OF THE CENTER FOR COASTAL RESOURCES MANAGEMENT
VIRGINIA INSTITUTE OF MARINE SCIENCE
COLLEGE OF WILLIAM AND MARY

Study on Abandoned and Discarded Blue Crab Traps

TO THE GOVERNOR AND
THE GENERAL ASSEMBLY OF VIRGINIA

HOUSE DOCUMENT NO. 7

COMMONWEALTH OF VIRGINIA
RICHMOND
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Study on abandoned and discarded blue crab traps

A Report to the Virginia General Assembly

Prepared in response to 2007 House Joint Resolution 650

By
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2007 HOUSE JOINT RESOLUTION NO. 650 provides:

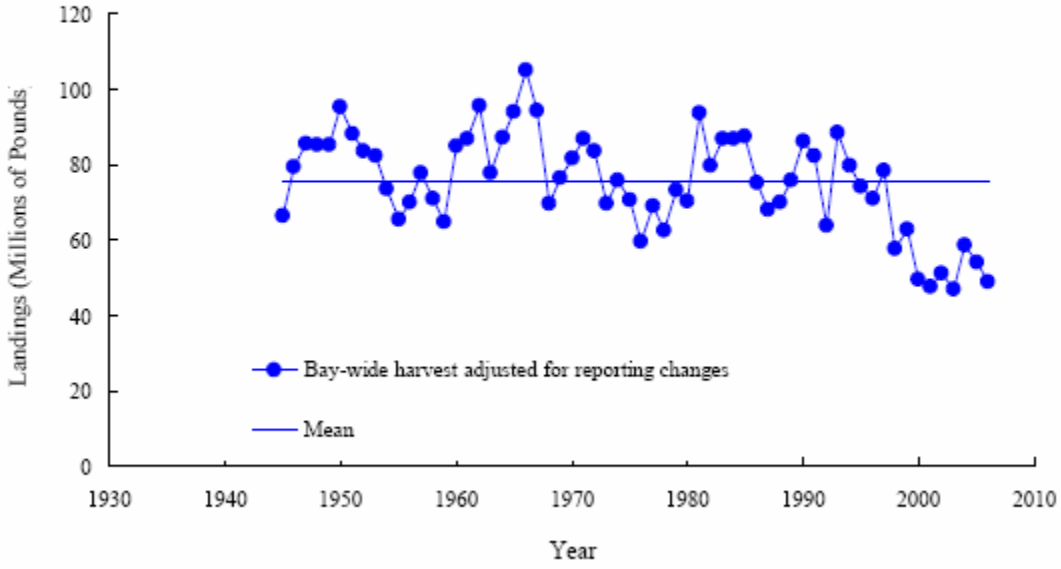
“That the Center for Coastal Resources Management at the Virginia Institute of Marine Science be requested to continue its study on abandoned and discarded crab traps. In conducting its study, the Center for Coastal Resources Management shall assess the scope of the derelict blue crab trap issue, consider and recommend marking requirements for crab traps that will minimize the destruction of crab traps and their markers, and work with appropriate state and federal agencies to identify potential mitigation options. The study shall recommend a strategy for managing abandoned and discarded crab traps.”

“The Center for Coastal Resources Management shall complete its meetings by November 30, 2007, and shall submit to the Governor and the General Assembly an executive summary and a report of its findings and recommendations for publication as a House or Senate document. The executive summary and report shall be submitted as provided in the procedures of the Division of Legislative Automated Systems for the processing of legislative documents and reports no later than the first day of the 2008 Regular Session of the General Assembly and shall be posted on the General Assembly's website.”

Background

Declines in the blue crab, *Callinectes sapidus*, harvest have been reported in the press and official reports. The 2007 Blue Crab Advisory Report of the Chesapeake Bay Stock Assessment Committee reported that "The 2006 Bay-wide crab harvest of 48.9 million pounds is among the lowest recorded since 1945 (Figure 5)" and that "Virginia's harvest of 20.8 million pounds was below the time series average for the state, but above the lowest values observed in the 1940's, 1950's and 1970's". It has been suggested that derelict or abandoned blue crab traps that continue to capture and kill blue crabs and other species may contribute to reduced harvests.

Figure 5. Chesapeake Bay Blue Crab harvest 1945-2006, adjusted for changes in reporting methods.
(2007 Blue Crab Advisory Report)



The number of derelict blue crab traps in the Chesapeake Bay is unknown. Typically, traps become lost when buoy lines are severed by vessel propellers, lines break due to age, poor choice of buoy material, traps are abandoned, vandalism, or storms roll traps pulling the buoy below the surface.

In Florida, Alabama, Mississippi, and Louisiana, estimates derived from trap loss calculations suggest derelict traps numbered at 605,000 in 1993. Another study using an annual total number of traps fished commercially at 1 million and a 25% loss/abandonment rate suggests 250,000 derelict traps are added to the Gulf of Mexico annually.

Lost or abandoned (derelict) commercial fishing gear, including nets and traps, can present safety, nuisance, and environmental impacts in estuarine waters. Blue crabs and various fish species that are entrapped and die in derelict traps can act as an attractant to crabs resulting in a self-baiting effect. Derelict fishing gear damages sensitive habitat and continues to capture both target and by-catch species, leading to reduced fitness and significant acute and delayed mortalities. Animals captured in derelict traps die from starvation, cannibalism, infection, disease, or prolonged exposure to poor water quality. In the Gulf of Mexico, evidence that derelict traps contribute to significant mortalities in the blue crab fishery prompted the development of removal strategies to reduce the ecologic and economic impacts of derelict traps.

In Virginia over 80% of the blue crab catch is from trapping. Information regarding the amount and effect of derelict traps in the Chesapeake Bay is limited. It has been estimated that commercial trap losses in the Bay may be as high as 30% per fisherman. In 2005 Virginia issued 1,524 blue crab commercial trapping licenses (not including peeler trap licenses) for a potential total of 368,900 traps. It is unlikely however that all the traps that could legally be deployed are actually deployed.

The *Fisheries Ecosystem Planning for the Chesapeake Bay (2006)* report documents that "lost and abandoned crab pots not only represent a direct economic loss to fishermen, but also pose attractive refuge sites that trap and eventually may kill significant numbers of crabs and finfish". In an independent review of the 2005 Stock Assessment for the blue crab it is "recommended that experiments and observations be designed to investigate the potential mortality arising through the agency of ghost fishing by self baiting lost crab pots. If this is found to be significant then options for ameliorating the problem should be developed".

Scope of the Derelict Blue Crab Issue in Virginia

Initial Investigation of Derelict Trap Density

Funding for the initial surveys and experiments has been provided by the National Oceanic and Atmospheric Administration (NOAA) Marine Debris Program through both the NOAA Chesapeake Bay Program Office and the National Fish and Wildlife Foundation. In the lower York River in Virginia, a census of derelict blue crab traps using side scan sonar technology identified between 635 to 676 derelict traps in a 33 km^2 area. Additional studies are necessary in Virginia to determine whether the derelict trap density found in the lower York River is representative of the Virginia portion of the Bay. Studies using similar methods in Maryland resulted in an estimate of approximately 42,000 derelict traps in the Maryland portion of the Bay. It is anticipated that some additional funding may be available in winter/spring 2008 for further surveys and experiments in Virginia.

By-Catch

Traps continue to capture crabs and other species after they are lost or abandoned. In field experiments in the lower York River, experimental derelict traps each captured, on average, about 50 blue crabs from April through November and 13 Atlantic croaker from May through August. A variety of species have been captured in derelict traps. Studies in Virginia have identified the following species:

Species
Blue crab *Callinectes sapidus*
Atlantic croaker *Micropogonias undulates*
Oyster toadfish *Opsanus tau*
White perch *Morone americana*
White catfish *Ameiurus catus*
Spot *Leiostomus xanthurus*
Blue catfish *Ictalurus furcatus*
Red drum *Sciaenops ocellatus*
Black seabass *Centropristis striata*
Sheepshead *Archosargus probatocephalus*
Summer flounder *Paralichthys dentatus*
Pumpkinseed *Lepomis gibbosus*
Muskrat *Ondatra zibethicus*
Eastern mud turtle *Kinosternon subrubrum*
Diamondback terrapin *Malaclemys terrapin*

Trap Degradation and Trapping Efficiency

Studies in Virginia have shown that crabs move relatively easily in and out of the lower chamber of the traps but are less likely to escape once they reach the upper chamber. Blue crab mortalities increase considerably after four days in a trap reaching over 80% after seven days. Studies in Virginia, and confirmed in Maryland, show very little trap degradation of derelict traps in brackish water areas with capture efficiency maintained beyond two years. Traps located in the southern portion of the bay or at the mouth of tributaries with higher salinities likely lose capture efficiency after 1.5 to 2 years due to encrustation by fouling organisms and subsequent collapse of the trap structure.

Consideration of Marking Requirements and Trap Removal

Marker Identification

Resource conflict between recreational boating and commercial crabbing likely contributes to the loss of many traps due to severing of trap buoy lines. To help avoid loss of traps due to severing of buoy lines, some states have buoy requirements for size and shape. New Jersey requires reflective tape or paint. Placement of traps to ensure that the buoy line swing-radius does not extend into channels may help reduce recreational boat and commercial trap conflicts.

Trap Removal and Gear Modification

Large scale removal efforts should be approached with caution as they may result in indiscriminate dredging of the bottom causing disruption of benthic habitat. A targeted approach in brackish water creeks or small watersheds may be more appropriate for removal programs. However, legal barriers for removal of abandoned or derelict traps may exist for private citizens or local community associations that may require adjustment to existing salvage laws. Changes to salvage laws to allow for removal by private citizens have been proposed for Florida (see 68B-55.002 Retrieval of Trap Debris) and Maryland.

Terrapin exclusion devices are used in some states when traps are deployed near marshes or in tributaries. Cull rings or escape rings are used in many states to allow the escape of undersized blue crabs and small finfish but the size and placement of the rings vary. Biodegradable panels or rot cord for trap openings are used in some states. Various state regulations are summarized in Appendix A.

Next Steps for Developing a Management Strategy

- Expand survey of derelict traps to other areas of the Virginia portion of the Chesapeake Bay.
- Test various trap modifications to reduce abandoned or lost trap species capture efficiency.
- Clarify, and possibly expand, who is authorized to remove derelict or abandoned traps.

Appendix A. State Regulations Summary (all subject to change, check contact number for confirmation)

	ALABAMA	DELAWARE	FLORIDA	GEORGIA	LOUISIANA	MARYLAND	MISSISSIPPI
SEASON	All Year	Mar 1 - Nov 30	All Year	All Year	Jan 30 - Apr 1	Mar 1 - Nov 30	All Year
CRAB SIZE LIMIT BY TYPE							
peeler		3"		3"		3.25"	
soft		3.5"				3.5"	
hard	5"	5"	5"	5"	5"	5"	5"
mature female							
CRAB TRAP: panels							
CRAB TRAP: mesh			1 1/2"	1 1/4"			
TERRAPIN EXCLUSION DEVICE	---	rec.fishers only	---	---	---	1 3/4" X 4 3/4"; rec. fishers only	---
BIODEGRADABLE PANEL	---	---	yes	---	---	---	---
BIODEGRADABLE FASTENERS							
CULL RINGS	no	rec.fishers only	yes - 3	yes - 2	yes 2	yes - 2	no
CULL RING SIZE			2 3/8"	2 3/8"	2 5/16"	2 5/16"	
CULL RING LOCATION (upper or lower chamber)			anywhere	anywhere	1 in each chamber	1 upper, 1 lower	
REFLECTIVE MATERIAL ON BUOYS	no	no	no	no	no	no	no
REQUIRED TO CLEAR TRAP EVERY		72 hours				72 hours	
BUOY SIZE	min 6" diameter		min 6" diameter		min 6" diameter		min 6"
BUOY COLOR	1/2 buoy colored	color assigned to licensee	contrasting color	---	---	---	highly visible color
LICENSE ON BUOY		yes	yes	yes		yes	
LICENSE ON TRAP		no	yes - tags	no		no	
TRAP REMOVAL PROGRAM		yes - off season and illegal	new program beginning	yes - illegal		yes - off season and illegal	
AUTHORIZED TO REMOVE DERELICT OR ABANDONED TRAPS		marine police		marine police		marine police	
DEPARTMENT CONTACT (Dept, Name, Phone)	Marine police - (334) 242-3673	Division of Fish & Wildlife - 302-739-9914	Div of Mar. Fish. Manag. (850) 487-0554	DNR - 912-264-7237	Louisiana Department of Wildlife & Fisheries - (225) 765-2800	DNR - 1-877-620-8367	228-596-7378
		* no crabbing in tributaries				* no crabbing in tributaries	

	NEW JERSEY	NORTH CAROLINA	SOUTH CAROLINA	TEXAS	VIRGINIA
SEASON	Apr 6 - Dec 4 (Del Bay); Mar 15 - Nov 30 (all other waters)	Feb 8 - Dec 14	June- Mar 14	All Year	Mar 1 - Nov 30
CRAB SIZE LIMIT BY TYPE					
peeler	3"				3"
soft	3.5"				3.5"
hard	4.75"	5"	5"	5"	5"
mature female	4.5"				
CRAB TRAP: panels	> 30"				
CRAB TRAP: mesh	< 1"	1 1/4"	1"		1 1/2"
TERRAPIN EXCLUSION DEVICE	6" X 2"	---	---	---	---
BIODEGRADABLE PANEL	6.5" X 5"	---	---	yes	---
BIODEGRADABLE FASTENERS	wood lath, cotton, hemp, sisal, jute; >1/16"			45-60 days to rot	
	metal; >3/32"				
CULL RINGS	no	yes - 2	yes - 2	yes - 2	yes - 2
CULL RING SIZE		2 5/16"	2 3/8"	2 3/8"	2 5/16" & 2 3/16"
CULL RING LOCATION (upper or lower chamber)		2 upper	1 upper, 1 lower		2 upper
REFLECTIVE MATERIAL ON BUOYS	yes-paint, tape	no	no	no	no
REQUIRED TO CLEAR TRAP EVERY	72 hours		5 days		
BUOY SIZE			spherical -6" non-spherical 10" long and 5" dia.	min 6"	
BUOY COLOR	---	---	---	---	---
LICENSE ON BUOY		yes	yes	yes	yes
LICENSE ON TRAP		no	yes -tags	no (tried it didn't work)	no
TRAP REMOVAL PROGRAM		yes - off season and illegal	yes - off season and illegal	yes	yes - off season and illegal
AUTHORIZED TO REMOVE DERELICT OR ABANDONED TRAPS		marine police	marine police	volunteers (30,000 pots ~6-7 years)	marine police
DEPARTMENT CONTACT (Dept, Name, Phone)		Div. Marine Fish. - 800-682-2632	DNR - 843-953-9312	Texas Parks and Wildlife Department - (800) 792-1112	VMRC - 757-247-2200

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