

**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
2008**

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

Center for Coastal Resources Management

Virginia Institute of Marine Science

College of William & Mary

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2007 HOUSE JOINT RESOLUTION NO. 650 provides:

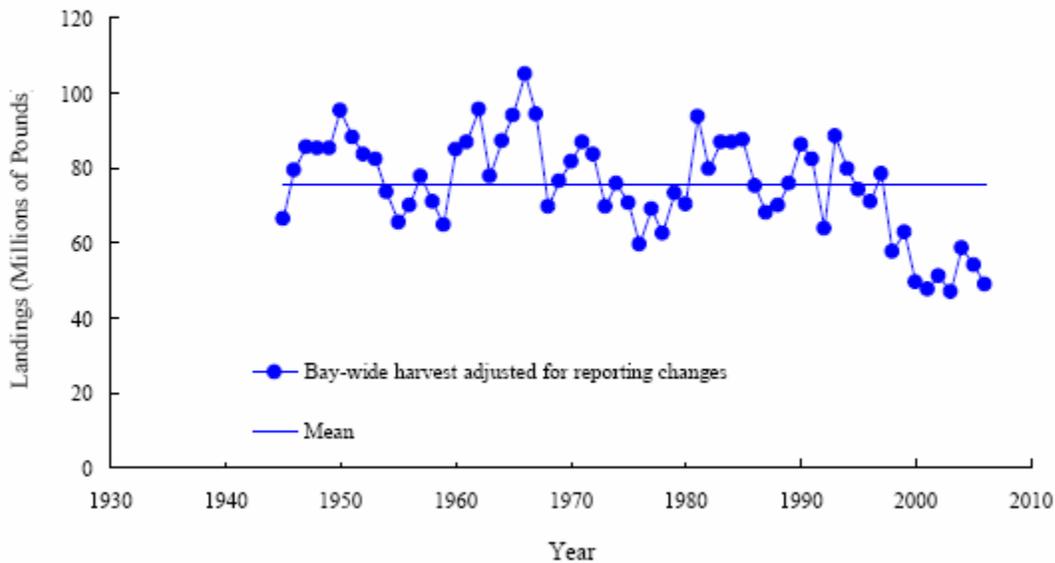
“That the Center for Coastal Resources Management at the Virginia Institute of Marine Science be requested to continue its study on abandoned and discarded crab traps. In conducting its study, the Center for Coastal Resources Management shall assess the scope of the derelict blue crab trap issue, consider 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 km² 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 <i>Callinectes sapidus</i> |
| Atlantic croaker <i>Micropogonias undulates</i> |
| Oyster toadfish <i>Opsanus tau</i> |
| White perch <i>Morone americana</i> |
| White catfish <i>Ameiurus catus</i> |
| Spot <i>Leiostomus xanthurus</i> |
| Blue catfish <i>Ictalurus furcatus</i> |
| Red drum <i>Sciaenops ocellatus</i> |
| Black seabass <i>Centropristis striata</i> |
| Sheepshead <i>Archosargus probatocephalus</i> |
| Summer flounder <i>Paralichthys dentatus</i> |
| Pumpkinseed <i>Lepomis gibbosus</i> |
| Muskrat <i>Ondatra zibethicus</i> |
| Eastern mud turtle <i>Kinosternon subrubrum</i> |
| Diamondback terrapin <i>Malaclemys terrapin</i> |

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.

Study on abandoned and discarded blue crab traps: Report to the Virginia General Assembly

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 | | | | | | | |
| <i>peeler</i> | | 3" | | 3" | | 3.25" | |
| <i>soft</i> | | 3.5" | | | | 3.5" | |
| <i>hard</i> | 5" | 5" | 5" | 5" | 5" | 5" | 5" |
| <i>mature female</i> | | | | | | | |
| 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

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| | 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 | | | | | |
| <i>peeler</i> | 3" | | | | 3" |
| <i>soft</i> | 3.5" | | | | 3.5" |
| <i>hard</i> | 4.75" | 5" | 5" | 5" | 5" |
| <i>mature female</i> | 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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