CHESAPEAKE BAY FOUNDATION

Environmental Protection and Restoration
Environmental Education

Senate Bill 257
Fishing Gear – Crab Pots – Ghost Panel Requirement

DATE: JANUARY 29, 2020 **POSITION: SUPPORT**

POSITION

The Chesapeake Bay Foundation supports Senate Bill 257 and recommends a favorable report from the Education, Health, and Environmental Affairs Committee. SB 257 would require the use of biodegradable panels or other mechanical devices to prevent 'ghost fishing' by lost or abandoned crab pots.

COMMENTS

The term 'ghost fishing' refers to the continual capture of crabs, fish, and other organisms in crab pots and other derelict fishing gear after it has been lost or abandoned. Often, the animals caught by lost or abandoned gear starve and die, resulting in a 'self-baiting' phenomenon where additional organisms, such as diamondback terrapins, are attracted to the gear by the scent of the captured fish and crabs, and perish.

A 2007 study conducted by the National Oceanic and Atmospheric Administration estimated that there are 84,567 lost or abandoned crab pots in Maryland waters of Chesapeake Bay. Each of these derelict pots was estimated to catch 20 crabs per year, resulting in a loss of more than 1.6 million crabs, a significant impact to the Maryland blue crab fishery.[1] Additionally, more than 40 other species, including white perch, oyster toadfish, and croaker were observed in these derelict pots.[2] Annually, watermen lose an average of 10-70% of their pots. Each of these pots can continue ghost fishing for several years, an issue exacerbated by the use of more durable materials for pot construction in recent decades.[3]

Ghost fishing may be prevented by the use of biodegradable panels or other mechanical means to disarm the pot after loss. These panels are designed to degrade in months as compared to the pots themselves that may take up to 15 years to degrade. Biodegradable panels do not affect catch rates of blue crabs and have already been employed in lobster, Dungeness crab, black sea bass, and stone crab fisheries. The mandatory use of these panels in blue crab pots in Maryland could significantly reduce wasteful losses to commercial and recreational fisheries through the prevention of ghost fishing.

CONCLUSION

For these reasons, the Chesapeake Bay Foundation recommends a favorable report on SB 257 from the Education, Health, and Environmental Affairs Committee. Please contact Dr. Allison Colden, Fisheries Scientist (acolden@cbf.org) should you require any additional information.

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[1] National Oceanic and Atmospheric Administration. https://chesapeakebay.noaa.gov/monitoring-and-research/marine-debris.
[2] Bilkovic, D.M, Havens, K., Stanhope, D. and Angstadt, K. 2014. Derelict fishing gear in Chesapeake Bay, Virginia: Spatial patterns and implications for marine fauna. Marine Pollution Bulletin. Available online: http://ccrm.vims.edu/marine_debris_removal/publications/MPB_Bilkovic_etal2014.pdf
[3] Virginia Institute of Marine Science, Center for Coastal Resource Management. Fact Sheet: Polyhydroxyalkanoate (PHA) biodegradable escape panel (biopanel) for crab, lobster, and fish traps. Available at https://www.vims.edu/ccrm/_docs/marine_debris/biodegradablepanel_factsheet.pdf

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FACT SHEET

Polyhydroxyalkanoate (PHA) biodegradable escape panel (biopanel) for crab, lobster, and fish traps.

Polyhydroxyalkanoates (PHAs) are a family of naturally occurring biopolyesters that are produced by bacteria and are completely biodegradable by microbes typically found in the marine environment. Bacteria create PHA and use it to store energy in a similar way that humans store energy as fat. In aquatic environments, bacteria recognize the material as a food source and consume it thus converting PHA to biomass, water, carbon dioxide, and naturally occurring monomers. PHA meets the American Society of Testing and Materials certification as well as European Standards for biodegradation in the marine environment [1]. PHA has physical characteristics similar to non-degradable plastics and can be formulated for extrusion into molded forms. A number of companies produce and sell a variety of PHA formulations [2]. The rate of biodegradation can be controlled by adjusting the thickness of the polymer [3].

Researchers at the Center for Coastal Resources Management, Virginia Institute of Marine Science, College of William & Mary, tested PHA as the material of choice for use in developing escape panels for crab, lobster, and fish traps (Fig. 1). VIMS researchers documented the extent of lost and abandoned blue crab traps and the effect on entrapped animals in the Virginia portion of the Chesapeake Bay. Over four consecutive winters, fishermen hired to recover lost traps removed almost 32,000 traps which contained almost 32,000 animals [4, 5]. The issue of lost and abandoned traps is a global problem in almost all the trap fisheries. Fishermen lose anywhere from 10 – 70% of their traps annually [6]. Problems with lost traps are compounded by the advent of long lasting synthetic material in trap construction with some trap types lasting up to 15 years.

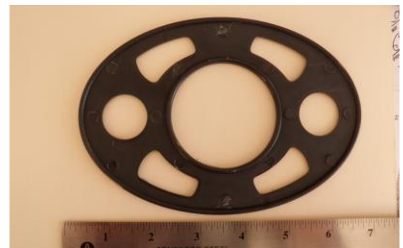

Figure 1. PHA biodegradable escape panel for blue crab traps.

Earlier methods of providing escape vents for animals captured in lost traps were prone to failure either by degrading too quickly or not at all [7]. Since PHA is consumed by bacteria, panels constructed of PHA have a high level of certainty of dissolving and providing an avenue for escape. Since PHA is consumed by bacteria naturally occurring in water, PHA biopanels have an added benefit of lasting longer if regularly fished. This is because microbes feeding on the PHA have inhibited or delayed growth when exposed to UV light during trap retrieval requiring constant regrowth of bacteria on biopanels of active traps. Lost traps however, remain on the bottom out of UV light exposure and populations of bacteria can proliferate and more quickly consume the PHA [8, 9].

In addition to blue crab traps, VIMS researchers developed prototype biopanels for a number of fisheries including lobster, Dungeness crab, black sea bass, and stone crab as well as a universal biopanel to fit most trap fisheries worldwide [*]. VIMS researchers working with fishermen found that using biopanels in blue crab traps did not affect catch rates [6].

References
[1] Chanprateep, S. 2010. Current trends in biodegradable polyhydroxyalkanoates. Journal of Bioscience and Bioengineering 110(6): 621-632.
[2] Corre, Y, S. Bruzard, J. Audic, Y. Grohens. 2012. Morphology and functional properties of commercial polyhydroxyalkanoates: A comprehensive and comparative study. Polymer Testing 31(2): 226-235.
[3] Thellen, C., M. Coyne, D. Froio, M. Auerbach, C. Wirsen, J. Ratto. 2008. A processing, characterization and marine biodegradation study of melt-extruded polyhydroxyalkanoate (PHA) films. J. Polym. Environ. 16: 1-11.
[4] Havens, K., D. Bilkovic, D. Stanhope, K. Angstadt. 2011. Fishery failure, unemployed commercial fishers, and lost blue crab pots: An unexpected success story. Environmental Science & Policy 14: 445-450.
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* The College of William & Mary has licensed the intellectual property rights to a Virginia-based company and, in accordance with university policy, researchers share in any net revenues.