

EXECUTIVE SUMMARY

Live Bait Study

Vector Management of Aquatic Invasive Species in Bloodworm Packing Material

This research project is a collaborative effort among the University of Maryland, the Smithsonian Environmental Research Center, the University of Wisconsin, and six university-based Sea Grant College programs in the Mid-Atlantic region from North Carolina to New Jersey. Our interest in this project is to understand the potential role of the live bloodworm trade in transporting non-native organisms from Maine to the Mid-Atlantic region.

Our research has encompassed the biological by cataloging the organisms that live on the seaweed packing materials that are commonly used in the bloodworm trade and to understand how they move and survive within this trade distribution pathway or “vector.” The study has also explored the social and economic dimensions of the industry including the beliefs and values of the industry and fishing community about bloodworms, the environment, and invasive species.

Ultimately, we hope to develop and inform intervention methods that will reduce or prevent the transportation of unwanted aquatic invasive species along this vector.

The biological approach to studying the vector involved collecting samples of the seaweed (*Ascophyllum nodosum*) from different points along the vector pathway. Samples were collected from saltwater marshes where the seaweed is harvested, from boxes of bloodworms containing seaweed from dealers in Maine, and in bait bags obtained from distributors and local bait stores in the Mid-Atlantic. Biologists sorted through the seaweed and collected, identified, and documented all of the organisms they found associated with it. The results indicate that the quantity of living organisms and the number of species are each still quite high following transport from Maine to the Mid-Atlantic. This is of great concern because these hitchhiking species are easily introduced to Mid-Atlantic waters (and other destinations around the globe) if the packing seaweed is thrown in the water. Among the many species found are some well-known invaders of California waters — e.g., the green crab (*Carcinus maenas*) and the rough periwinkle (*Littorina saxatilis*) — that are thought to travel through this vector.

The scientists also tested whether there might be ways to treat the seaweed, before it leaves Maine, in order to reduce the quantity of organisms transported. One approach involved soaking the seaweed in low-salinity tap water, high-salinity water, and a combination of the two, prior to using it for packing material. These techniques were successful at killing or removing most of the offending organisms, while preserving the utility of the seaweed as an effective packing material for bloodworm shipments.

The social science approach to studying the live bloodworm trade involved work by social scientists to interview dealers and survey anglers. These groups participate in the bloodworm

industry as sellers and buyers. We sought to understand the dealers' views on the invasive species issue, on the use of potential alternative packing materials that might reduce the invasive species risk posed by shipping live bait, and on the potential effects that changes in bloodworm packing and shipping methods might have on their industry. We found that the dealers are aware of the invasive species issue but don't think it poses a significant problem. They believe that their customers (distributors and anglers) prefer the seaweed packing to other materials, and they believe that the seaweed packing is superior to other materials at keeping worms alive. We also found that regional distributors have significant influence over the dealers, and dealers are willing — almost without regard for added cost and labor — to change packing methods if the distributors request it.

We surveyed Mid-Atlantic anglers in order to understand their beliefs and values about bloodworms, seaweed, and the invasive species risks associated with them. We found that anglers are concerned about the threat of invasive species in the region but were not aware of the risk posed by bloodworms and the seaweed packing material. Many already do discard their worms and seaweed in the garbage, and most who were unaware of the invasive risk associated with the worms were willing to do so once they were informed.

The final research component of our project is to work with bait shop owners to understand their effectiveness as opinion leaders to increase angler awareness about invasive species and the risks they pose to fishing waters. We hope to work with bait shop owners to encourage anglers to throw all live bait and its packing material in the trash rather than on the land or in the water.

Contact and Other Information

Visit the study's website: www.baitwormstudy.net

Contact your state Sea Grant program office:

Delaware: John W. Ewart
Email: ewart@udel.edu

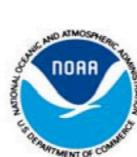
New Jersey: Michael J. Danko
E-mail:
mdanko@njseagrant.org

Pennsylvania: Sarah N. Whitney
E-mail: swhitney@psu.edu

Maryland: Krisztian Varsa
Email: kvarsa@umd.edu

North Carolina: Sara Mirabilio
Email:
saram@csi.northcarolina.edu

Virginia: Susan Park
Email: spark@vims.edu



Smithsonian
Environmental
Research Center