

To: Maine Legislature, Joint Standing Committee on Natural Resources
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Augusta, ME 04333-0100

From: Maine Sea Grant
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Maine Sea Grant Informational Testimony

LD #667 (HP 487)

"Resolve, Regarding Nonnative Invasive Marine Species"
Sponsored by Representative Herbert Adams

To the Joint Standing Committee on Natural Resources

Public Hearing: April 29, 9:00 a.m.
Cross State Office Building, Augusta, ME

Senator Cowger, Representative Koffman and Members of the Joint Standing Committee on Natural Resources:

My name is Tracy Hart. I work as a Marine Extension Associate for the Maine Sea Grant Program at the University of Maine. Maine Sea Grant is a public, non-advocacy organization; therefore I am here today to provide neither-for-nor-against informational testimony on LD #667.

Maine Sea Grant's mission is to play a leadership role in marine science and education and to promote their use in the sustainable development, management, and stewardship of marine and coastal resources. In line with that mission, Maine Sea Grant has been involved in marine invasive species education and outreach over the past year and a half. We have recently received funding to work in collaboration with other New England Sea Grant programs to conduct outreach on vectors for marine invasive species introductions over the next two years. I would like to share information I have gleaned about the issue's status in the state of Maine.

In 2004, I was invited by the Casco Bay Estuary Project (CBEP) to co-coordinate a forum titled *Maine's Marine Invasion: A Forum on the Impact of Non-native and Other Invasive Species on Maine's Coastal Ecosystems*, which was held May 5, 2004 at the University of Southern Maine in Portland. The forum was designed to raise public awareness of non-native marine species invasions in Maine state waters and energize further collaboration on marine invasive species monitoring, research, management, and education throughout the state and regionally. Presentations from the forum are available at <http://www.cascobay.usm.maine.edu/invasives.html> and include the results of an August

2003 survey for marine invasive species in Casco Bay, an overview of current and potential marine species invasions and their impacts, and information about the mechanisms that move new marine organisms into Maine waters. Participant discussions focused on next steps for Maine in marine invasive species education, research, monitoring, and management.

In addition, Maine Sea Grant recently led an effort to develop a general fact sheet on marine invasive species in collaboration with the Maine Marine Invasive Species Working Group. The fact sheet is available at <http://www.seagrant.umaine.edu/documents/pdf/MMI05.pdf> and is being submitted with this testimony.

I would like to report on some of the points highlighted by speakers and participants at the 2004 forum, as well as some of the information included in the fact sheet and subsequent Maine Sea Grant presentations:

- *How many marine non-native and invasive species are there in Maine?* It is uncertain exactly how many non-native marine species reside in Maine's coastal and marine areas. Dr. James Carlton, a leading marine invasive species scientist from The Maritime Studies Program of Williams College & Mystic Seaport in Connecticut, developed a preliminary list of introduced species in Maine for the forum. The document, titled *A Checklist of the Introduced Marine and Estuarine Organisms on the Coast of Maine, U.S.A.: A Preliminary Checklist*,¹ lists 33 introduced marine species in Maine waters and 2 additional species whose establishment in Maine is uncertain. How many non-native marine species in Maine are or will become invasive (i.e. cause significant ecologic or economic harm) is unknown.
- *How does Maine compare to the U.S. as a whole?* Maine has lower numbers of non-native marine species than many other states. In contrast to Maine's estimate of 33 non-native marine species, it is estimated that San Francisco Bay and Delta, which is believed to have the greatest number, has 234 non-native plant and animal species.² Approximately 50,000 non-native species are estimated to have been introduced to the United States (USBC 1998). Of these, at least 400 have become established in North America since the arrival of the first European settlers (Ruiz et al. 1997).
- *What threats are posed by marine invasive species?* While many marine species introduced to Maine are unable survive and reproduce, those that do may be free of the predators, diseases and competition that keep their numbers in check in their native environment. Those species that are able to withstand or adapt to the new conditions have the potential to spread and disrupt marine ecosystems and the human activities that depend on these systems. Marine invasive species have imposed economic and environmental costs in Maine. For example, Robin Hadlock Seeley of Cornell University presented that European green crab (*Carcinus maenas*) predation on Maine's soft-shell clams is blamed widely for large economic losses to state's shellfishing industry, although the relative impact of the crabs versus other factors on the shellfish decline is not known. The U.S. spends an estimated \$137 billion to deal

¹ <http://www.seagrant.umaine.edu/documents/pdf/invchk.pdf>

² <http://stlwaterfrontcouncil.org/Species.htm>

with invasive species annually (Pimentel 2000). In addition to predation, marine invasive species can outcompete native species for space and resources; dislodge or overgrow native species; block light to plants; alter habitats; prevent larval settlement; or spread new diseases. These species can also clog fishing gear and aquaculture pens, foul boats, piers, and other man-made structures, and impose control, research, and monitoring costs. Approximately 400 of the 958 species that are listed as threatened or endangered under the Endangered Species Act are considered to be at risk primarily because of competition with and predation by nonindigenous species (TNC 1996, Wilcove et al. 1998).

- *Are all introduced species harmful?* Some species introductions in the U.S. have been beneficial. Species introduced as food crops (e.g., corn, wheat, and rice) and as livestock (e.g., cattle and poultry) now provide more than 98% of the U.S. food system, at a value of approximately \$800 billion per year (USBC 1998).
- *What new problems may be on the horizon?* Forum speakers stated that a number of marine invasive species, which have caused harm to aquaculture, fishing industries, marine infrastructure, shipping and tourism in Southern New England and Maritime Canada, are either poised at Maine's border or have already crossed into this state. For example, Green Fleece (*Codium fragile* spp. *tomentosoides*), which has altered marine communities, clogged beaches and impacted shellfish beds and aquaculture to the north and south, is now present in Maine's coastal waters. Maine waters also contain a number of non-native sea squirt species that have caused large economic losses to shellfish aquaculturists in Maritime Canada. Scientists are concerned that the Rapa whelk (*Rapana venosa*), which has been harmful enough to warrant a bounty in the mid-Atlantic, will become established in the Gulf of Maine in the next decade. A presentation produced by Larry Harris and Megan Tyrrell of the University of New Hampshire listed 5 species that were not found during a 2003 assessment in Maine, but are predicted to become abundant in this region based on their current distribution and environmental tolerance.
- *How are non-native species introduced into Maine's marine and estuarine waters?* Historically shipping has been the primary means of aquatic introductions (Ruiz et al. 2000). Shipping accounts for 2/3 of world trade in tonnage and species can arrive in Maine via shipping either attached to ship hulls or in ballast water (Smith 2004). It is estimated that over 5,000 species are being transported around the world on a daily basis in ballast water (Carlton 2001; Vitousek et al. 1997). Several non-native species in Maine are believed to have arrived via ballast water, including examples such as: the Lacy Crust Bryozoan (*Membranipora membranacea*), which is now the dominant species on Maine kelps and decreases kelp growth and survival (Pratt, 2005); and the aforementioned European green crab. Analysis of shipping patterns in New England suggest that 25% undergo ballast water exchange (Pederson, 2003)
- New England ports receive relatively little ballast water compared to other states (Smith et al. 1999); therefore, non-shipping pathways for non-native marine introductions may also be important in this region (Weigle et. al, in print). Aquaculture products can be non-native and can also carry hitchhikers. Live seafood can be imported from other areas and be released. Species used as live bait can also pose a risk if introduced and bait packing materials can carry hitchhikers. Public aquariums, scientists, and researchers collect non-local species or buy them from

marine biological suppliers. Species are imported by pet and aquarium shops. Internet trade is also greatly increasing the rate and quantity of non-native species bought, sold, and transported around the world. In a recent study in Massachusetts (Weigle et. al, in print), no single non-shipping vector stood out as presenting a primary risk. Each evidenced characteristics or practices that could facilitate introductions.

- *Prevention emphasized.* Forum presenters emphasized repeatedly that once introduced species have become established, eradication is costly and often impossible. For example, in Maine, significant sums and effort were deployed to eradicate the European green crab in the 1960s without success. Prevention was emphasized.
- *Forum recommendations.* Actions recommended by forum speakers included identifying which vectors are important to a region; understanding the dynamics of importation; adopting vector-specific best management practices; educational outreach; precautions to prevent release; monitoring; and the implementation of rapid response and detection systems. Participants additionally called for attention to our state's export, as well as import, of marine species and a designated state agency position devoted to marine invasive species priorities.

Based on information presented at the 2004 forum, the event's steering committee made a decision to continue meeting following the forum in order to 1) promote multi-institutional dialogue and collaboration on Maine's marine invasive species issues; and 2) define priorities for marine invasive species research, monitoring, management and education. The group, now called the Maine Marine Invasive Species Working Group, meets monthly and has expanded to 28 members including scientists, educators, agency representatives from the Department of Marine Resources and Department of Environmental Protection, representatives from the Northeast Aquatic Nuisance Species Panel, and marine professionals from academic and non-profit organizations. The multi-institutional collaboration represented by this working group suggests perceived need, as well as broad-scale voluntary commitment, to this issue in Maine.

Thank you for your attention.

Sincerely,

Tracy Hart
Marine Extension Associate, Maine Sea Grant Program