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Testimony submitted to

U.S. House of Representatives

Committee on Resources

Subcommittee on Fisheries Conservation, Wildlife and Oceans.

Tuesday, April 29, 2003

by

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Testimony

Mr. Chairman, Members of the Committee, it is a pleasure to be here today in response to your invitation to provide testimony on problems related to non-native, invasive species to the United States of America.

My name is Roger Mann. I am a Professor of Marine Science and Acting Director for Research and Advisory Services at the School of Marine Science, Virginia Institute of Marine Science, College of William and Mary. I have been a researcher in the field of marine science for over thirty years. During that period I have maintained an active interest in the biology of non-native aquatic species, and actively participated in research and policy development related to non-native species at the state, regional, national and international levels. One of my current research projects describes the increasing destructive impacts of an invading predatory marine snail on shellfish resources in the Chesapeake Bay. The fact that this recent, unwanted invader, together with many others, arrived on our shores through ballast water vectors underscores my interest in today's discussion. The arrival of non-native species into the United States through ballast water and other vectors is widely recognized as a significant threat to the integrity of native ecosystems, and hence to the nation's economy as well as its recreational and aesthetic resources.

Your invitation requested comment on four subjects: the scope of the invasive species problem, efforts to control or eradicate unwelcome invaders, the adequacy of existing statutory authority, and recommendations to solve the continuing problem. I will address these in order.

The scope of the problem is massive on both a national and international scale. In terms of ecological impact, The Convention on Biological Diversity considers invasive species the second biggest threat, after environmental loss, to native biodiversity. Non-native species have been identified as contributors to the decline of 42% of US endangered and threatened species. The financial burden to the US economy is illustrated by the \$550 million annual budget of just one federal agency, the USDA, for control of unwanted invasive species. The magnitude of the problem at the state level is demonstrated by a few examples. Hawaii has 956 native plant species compared to 861 invaders. California has 83 native freshwater fish species, but an additional 52 invaders are also resident. Similar evidence of invasions is noted at the global

level of view. Twenty-one of 49 resident mammal species in the United Kingdom are non-native including eight large deer or goat species. New Zealand has 1790 native plant species compared to 1570 invaders. South Africa has 176 native freshwater fish species, but is also home to 52 invading species. Even remote island systems are not immune to invasion by non-native species. Tristan de Cunha in the South Atlantic has 70 native plants but 97 invaders, and South Georgia, surrounded by the circumpolar current of the Antarctic, has 26 native plants but 54 invaders. The important "take home message" is that the United States is but a part of the network of international trade that historically built this country, and is vital to its continuing social and economic wealth, but that network is also the vector facilitating a continuing supply of invading species to our shores. In developing responses to invaders already in residence, and providing control to stop the continuing assault, we must lead the international community by example for both our and their benefit. Trade routes work in both directions, and the adoption and application of common safeguards to all routes of passage that eliminate transport and delivery of invaders beyond their native ranges will serve all by reducing this global homogenization of species distributions and the subsequent ecological and economic stress on receptor systems.

Efforts to control invasions and existing statutory authority to enable control are intimately linked and will be addressed together. While the Lacey Act probably best defines the principles of control at the federal level a litany of federal statutes illustrates the continuing and growing awareness of invasive species for well over half a century. These landmark actions include the Plant Quarantine Act, Animal Damage Control Act, Federal Seed Act, Organic Act of 1944, Federal Plant Pest Act, National Environmental Policy Act of 1970 (NEPA), Endangered Species Act (ESA), Federal Noxious Weed Act, Alien Species Prevention and Enforcement Act of 1992, Wild Bird Conservation Act of 1992, Hawaii Tropical Forest Recovery Act of 1992, and Executive Order 13112. Lacey is worthy of special note in that it recognizes the role of state statute and defaults to state level authority where it is written in state code. My home state of Virginia is such an example with the Code of Virginia designating authority over intentional introductions of non-native species to specific state agencies.

A powerful and important controlling federal statute is the National Invasive Species Act of 1996 that provides a unifying theme to extant statutes. It is currently under revision and discussion for reauthorization. In November of 2002 I had the pleasure of appearing before this Committee to provide testimony of the draft revision in the form of House Resolution 5396. While I recommended modest changes to wording in HR 5396, I urged the Congress to move forward on reauthorization, and in doing so provide standards to reduce continuing invasions via ships' ballast water. We must become more aggressively proactive in preventing unwanted invasions, but we must do it without encumbering the process of international trade. I will briefly reiterate comment from that testimony. Innovative technologies are currently under development in the private sector for application in ballast water control. Interim standards set by this bill must provide specific targets for the technology developers, for without these their economic investment cannot be targeted at the eventual market in the shipping industry. The US has the unquestioned capability to be the world leader in ballast water control technologies. I proposed adoption of a standard requiring 100% kill of all organisms in excess of 50 microns maximum dimension in discharged ballast - a standard that is both within reach of current technologies for very large volumes and that would be successful in retaining all the life history stages, including eggs, of the vast majority of aquatic vertebrates, invertebrates and macroalgae. While this standard would not insure removal of most phytoplankton and toxic dinoflagellates that cause red tide blooms - a group that may well represent a very serious challenge to any and all of the currently researched control technologies - it does represent a significant advancement of current options focused on ballast water exchange. We should not be handcuffed by the search for ultimate control tools while good, although perhaps not perfect, technology is within our grasp to address the ecological problem at hand. Incremental common sense dictates employment of the best available tools now, and better tools in due course. The draft of HR 5396 contained provision for continual review and improvement in standards as technology improves. I applaud this provision and urge its inclusion in the final draft of the reauthorization.

Identification of the avenues of invasion stimulates definition of the technical problem for control. Technical problems stimulate innovation in engineering to solve the problem when a defined goal, a discharge standard, is set in statute. Economic opportunity drives process, with preservation of native ecological complexity being the eventual benefactor.

Enabling legislation plays a central role in solving the continuing problem of environmental and economic impact of unwanted invasions. But that legislation must be soundly based in knowledge of how invaders arrived and why they survived to flourish in a novel environment. Despite numerous examples of successful

invasions, and probably an even greater number of potential invasions that failed to establish, the global scientific community has very limited ability to predict with any level of certainty both the numbers and variety of invading species that will successfully become established in novel receptor environments in the near future. Future legislation must address this deficiency by providing funds for new and continuing research on a broad range of invasive species issues, and enable avenues to deliver the associated results to the regulatory process. Current levels of research and educational support are inadequate to address this expanding problem. Knowledge is a powerful tool that we must pursue and share to detect, control, and where possible, eradicate invading unwanted non-native species from both terrestrial and aquatic ecosystems of the United States. We must do better. With guidance, support, and a charge from Congress the scientific community will do better.

Before concluding I will briefly comment on one further subject area, that of intentional introductions of non-native species. While there is increasing and warranted recognition of the deleterious and often highly visible impacts of non-native invasive species in this country, it is appropriate to note that selected non-native species do provide beneficial roles in the ecology and economy of our nation. For example, recent USDA data reports that 16% of the nine trillion-dollar GNP of the United States come from agricultural production and associated activity. More than 90% of global agricultural production is based on 20 plant and six animal species with widespread distribution from intentional introductions. Production in the United States reflects this focus on non-native species -- European settlement of North America included the introduction of wheat, barley, rye, cattle, pigs, horses, sheep, goats and more. Indeed, the majority of US agricultural production arguably comes from species whose genetic origin was not in North America and it would be interesting to speculate on how colonization of North America would have proceeded had settlers been limited to agriculture based exclusively on native animals and plants. The draft version of House Resolution 5396 contained text addressing intentional introductions for beneficial uses. I applaud the inclusion of this in that it both recognizes a continuing pressure for introductions for commercial production, pest control and environmental restoration purposes and the need to carefully examine and control such actions in an environment of limited understanding and potentially serious, even irreversible ecological impact. However, I urge the final version of this legislation to include text recognizing the role of state rights, in addition to federal responsibility, in debate of this important subject.

In conclusion, I again thank the Committee for the opportunity to provide testimony. This completes my testimony.

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