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AQUATIC INVASIVE SPECIES RESEARCH ACT

OCTOBER 20, 2003.—Ordered to be printed

Mr. BOEHLERT, from the Committee on Science, submitted the following

R E P O R T

[To accompany H.R. 1081]

[Including cost estimate of the Congressional Budget Office]

The Committee on Science, to whom was referred the bill (H.R. 1081) to establish marine and freshwater research, development, and demonstration programs to support efforts to prevent, control, and eradicate invasive species, as well as to educate citizens and stakeholders and restore ecosystems, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

CONTENTS

I. Amendment 2
II. Purpose of the Bill 8
III. Background and Need for the Legislation 8
IV. Summary of Hearings 11
V. Committee Actions 15
VI. Summary of Major Provisions of the Bill 16
VII. Section-By-Section Analysis 16
VIII. Committee Views 19
IX. Cost Estimate 22
X. Congressional Budget Office Cost Estimate 23
XI. Compliance with Public Law 104–4 (Unfunded Mandates) 24
XII. Committee Oversight Findings and Recommendations 24
XIII. Statement on General Performance Goals and Objectives 24
XIV. Constitutional Authority Statement 24
XV. Federal Advisory Committee Statement 24
XVI. Congressional Accountability Act 24
XVII. Statement on Preemption of State, Local, or Tribal Law 24
XVIII. Changes in Existing Law Made by the Bill, As Reported 25
XIX. Committee Recommendations 26
XX. Proceedings of Subcommittee Markup 27
XXI. Proceedings of Full Committee Markup 45

29–006

I. AMENDMENT

The amendment is as follows:

Strike all after the enacting clause and insert the following:

SECTION 1. SHORT TITLE.

This Act may be cited as the "Aquatic Invasive Species Research Act".

SEC. 2. FINDINGS.

The Congress makes the following findings:

(1) Aquatic invasive species damage infrastructure, disrupt commerce, outcompete native species, reduce biodiversity, and threaten human health.

(2) The direct and indirect costs of aquatic invasive species to our Nation's economy number in the billions of dollars per year. In the Great Lakes region, approximately $3,000,000,000 dollars have been spent in the past 10 years to mitigate the damage caused by one invasive species, the zebra mussel.

(3) Recent studies have shown that, in addition to economic damage, invasive species cause enormous environmental damage, and have cited invasive species as the second leading threat to endangered species.

(4) Over the past 200 years, the rate of detected marine and freshwater invasions in North America has increased exponentially.

(5) The rate of invasions continues to grow each year.

(6) Marine and freshwater research underlies every aspect of detecting, preventing, controlling, and eradicating invasive species, educating citizens and stakeholders, and restoring ecosystems.

(7) Current Federal efforts, including research efforts, have focused primarily on controlling established invasive species, which is both costly and often unsuccessful. An emphasis on research, development, and demonstration to support efforts to prevent invasive species or eradicate them upon entry into United States waters would likely result in a more cost-effective and successful approach to combating invasive species through preventing initial introduction.

(8) Research, development, and demonstration to support prevention and eradication includes monitoring of both pathways and ecosystems to track the introduction and establishment of nonnative species, and development and testing of technologies to prevent introduction through known pathways.

(9) Therefore, Congress finds that it is in the United States interest to conduct a comprehensive and thorough research, development, and demonstration program on aquatic invasive species in order to better understand how aquatic invasive species are introduced and become established and to support efforts to prevent the introduction and establishment of, and to eradicate, these species.

SEC. 3. DEFINITIONS.

In this Act:

(1) ADMINISTERING AGENCIES.—The term "administering agencies" means—

(A) the National Oceanic and Atmospheric Administration (including the Great Lakes Environmental Research Laboratory);

(B) the Smithsonian Institution (acting through the Smithsonian Environmental Research Center); and

(C) the United States Geological Survey.

(2) AQUATIC ECOSYSTEM.—The term "aquatic ecosystem" means a freshwater, marine, or estuarine environment (including inland waters, riparian areas, and wetlands) located in the United States.

(3) BALLAST WATER.—The term "ballast water" means any water (with its suspended matter) used to maintain the trim and stability of a vessel.

(4) INVASION.—The term "invasion" means the introduction and establishment of an invasive species into an ecosystem beyond its historic range.

(5) INVASIVE SPECIES.—The term "invasive species" means a species—

(A) that is nonnative to the ecosystem under consideration; and

(B) whose introduction causes or may cause harm to the economy, the environment, or human health.

(6) INVASIVE SPECIES COUNCIL.—The term "Invasive Species Council" means the council established by section 3 of Executive Order No. 13112 (42 U.S.C. 4321 note).

(7) PATHWAY.—The term "pathway" means 1 or more routes by which an invasive species is transferred from one ecosystem to another.

(8) SPECIES.—The term "species" means any fundamental category of taxonomic classification or any viable biological material ranking below a genus or subgenus.

(9) TASK FORCE.—The term "Task Force" means the Aquatic Nuisance Species Task Force established by section 1201(a) of the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (16 U.S.C. 4721(a)).

(10) TYPE APPROVAL.—The term "type approval" means an approval procedure under which a type of system is certified as meeting a standard established pursuant to Federal law for a particular application.

SEC. 4. COORDINATION AND IMPLEMENTATION.

(a) COORDINATION.—In carrying out this Act, the administering agencies shall coordinate with—

(1) appropriate State agencies;

(2) the Fish and Wildlife Service, the Environmental Protection Agency, and other appropriate Federal agencies; and

(3) the Task Force and Invasive Species Council.

(b) IMPLEMENTATION.—The administering agencies shall enter into a memorandum of understanding regarding the implementation of this Act, which shall include the coordination required by subsection (a).

(c) COOPERATION.—In carrying out this Act, the administering agencies shall contract, as appropriate, or otherwise cooperate with academic researchers.

(d) STRUCTURE.—To the extent practicable, the administering agencies shall carry out this Act working within the organizational structure of the Task Force and Invasive Species Council.

SEC. 5. ECOLOGICAL AND PATHWAY RESEARCH.

(a) IN GENERAL.—The administering agencies shall develop and conduct a marine and fresh-water research program which shall include ecological and pathway surveys and experimentation to detect nonnative aquatic species in aquatic ecosystems and to assess rates and patterns of introductions of nonnative aquatic species in aquatic ecosystems. The goal of this marine and freshwater research program shall be to support efforts to prevent the introduction of, detect, and eradicate invasive species through informing early detection and rapid response efforts, informing relevant policy decisions, and assessing the effectiveness of implemented policies to prevent the introduction and spread of aquatic invasive species. Surveys and experiments under this subsection shall be commenced not later than 18 months after the date of the enactment of this Act.

(b) PROTOCOL DEVELOPMENT.—The administering agencies shall establish standardized protocols for conducting ecological and pathway surveys of nonnative aquatic species under subsection (a) that are integrated and produce comparable data. Protocols shall, as practicable, be integrated with existing protocols and data collection methods. In developing the protocols under this subsection, the administering agencies shall draw on the recommendations gathered at the workshop under subsection (g). The protocols shall be peer reviewed, and revised as necessary. Protocols shall be completed within 1 year after the date of the enactment of this Act.

(c) ECOLOGICAL AND PATHWAY SURVEY REQUIREMENTS.—(1) Each ecological survey conducted under subsection (a) shall, at a minimum—

(A) document baseline ecological information of the aquatic ecosystem including, to the extent practicable, a comprehensive inventory of native species, nonnative species, and species of unknown origin present in the ecosystem, as well as the chemical and physical characteristics of the water and underlying substrate;

(B) for nonnative species, gather information to assist in identifying their life history, environmental requirements and tolerances, the historic range of their native ecosystems, and their history of spreading from their native ecosystems;

(C) track the establishment of nonnative species including information about the estimated abundance of nonnative organisms in order to allow an analysis of the probable date of introduction of the species; and

(D) identify the likely pathway of entry of nonnative species.

(2) Each pathway survey conducted under this section shall, at a minimum—

(A) identify what nonnative aquatic species are being introduced or may be introduced through the pathways under consideration;

(B) determine the quantities of organisms being introduced through the pathways under consideration; and

(C) determine the practices that contributed to or could contribute to the introduction of nonnative aquatic species through the pathway under consideration.

(d) NUMBER AND LOCATION OF SURVEY SITES.—The administering agencies shall designate the number and location of survey sites necessary to carry out marine and freshwater research required under this section. In establishing sites under this subsection or subsection (e), emphasis shall be on the geographic diversity of sites, as well as the diversity of the human uses and biological characteristics of sites.

(e) COMPETITIVE GRANT PROGRAM.—The National Oceanic and Atmospheric Administration and the United States Geological Survey shall jointly administer a program to award competitive, peer-reviewed grants to academic institutions, State agencies, and other appropriate groups, in order to assist in carrying out subsection (a), and shall include to the maximum extent practicable diverse institutions, including Historically Black Colleges and Universities and those serving large proportions of Hispanics, Native Americans, Asian-Pacific Americans, or other underrepresented populations.

(f) SHIP PATHWAY SURVEYS.—Section 1102(b)(2)(B)(ii) of the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (16 U.S.C. 4712(b)(2)(B)(ii)) is amended to read as follows:

"(ii) examine other potential modes for the introduction of nonnative aquatic species by ship, including hull fouling.".

(g) WORKSHOP.—In order to support the development of the protocols and design for the surveys under subsections (b) and (c), and to determine how to obtain consistent, comparable data across a range of ecosystems, the administering agencies shall convene at least one workshop with appropriate researchers and representatives involved in the management of aquatic invasive species from Federal and State agencies and academic institutions to gather recommendations. The administering agencies shall make the results of the workshop widely available to the public. The workshop shall be held within 180 days after the date of the enactment of this Act.

(h) EXPERIMENTATION.—The administering agencies shall conduct research to identify the relationship between the introduction and establishment of nonnative aquatic species, including those legally introduced, and the circumstances necessary for those species to become invasive.

(i) NATIONAL PATHWAY AND ECOLOGICAL SURVEYS DATABASE.—

(1) IN GENERAL.—The United States Geological Survey shall develop, maintain, and update, in consultation and cooperation with the Smithsonian Institution (acting through the Smithsonian Environmental Research Center), the National Oceanic and Atmospheric Administration, and the Task Force, a central, national database of information concerning information collected under this section.

(2) REQUIREMENTS.—The database shall—

(A) be widely available to the public;

(B) be updated not less than once a quarter;

(C) be coordinated with existing databases, both domestic and foreign, collecting similar information; and

(D) be, to the maximum extent practicable, formatted such that the data is useful for both researchers and Federal and State employees managing relevant invasive species programs.

SEC. 6. ANALYSIS.

(a) INVASION ANALYSIS.—

(1) IN GENERAL.—Not later than 3 years after the date of the enactment of this Act, and every year thereafter, the administering agencies shall analyze data collected under section 5 and other relevant research on the rates and patterns of invasions by aquatic invasive species in waters of the United States. The purpose of this analysis shall be to use the data collected under section 5 and other relevant research to support efforts to prevent the introduction of, detect, and eradicate invasive species through informing early detection and rapid response efforts, informing relevant policy decisions, and assessing the effectiveness of implemented policies to prevent the introduction and spread of invasive species.

(2) CONTENTS.—The analysis required under paragraph (1) shall include with respect to aquatic invasive species—

(A) an analysis of pathways, including—

(i) identifying, and characterizing as high, medium, or low risk, pathways regionally and nationally;

(ii) identifying new and expanding pathways;

(iii) identifying handling practices that contribute to the introduction of species in pathways; and

(iv) assessing the risk that species legally introduced into the United States pose for introduction into aquatic ecosystems;

(B) patterns and rates of invasion and susceptibility to invasion of various bodies of water;

(C) how the risk of establishment through a pathway is related to the identity and number of organisms transported;

(D) rates of spread and numbers and types of pathways of spread of new populations of the aquatic invasive species and an estimation of the potential spread and distribution of newly introduced invasive species based on their environmental requirements and historical distribution;

(E) documentation of factors that influence an ecosystem's vulnerability to a nonnative aquatic species becoming invasive;

(F) a description of the potential for, and impacts of, pathway management programs on invasion rates;

(G) recommendations for improvements in the effectiveness of pathway management;

(H) to the extent practical, a determination of the level of reduction in live organisms of various taxonomic groups required to reduce the risk of establishment to receiving aquatic ecosystems to an acceptable level; and

(I) an evaluation of the effectiveness of management actions (including any standard) at preventing nonnative species introductions and establishment.

(c) RESEARCH TO ASSESS THE POTENTIAL OF THE ESTABLISHMENT OF INTRODUCED SPECIES.—Within 2 years after the date of the enactment of this Act, the administering agencies shall develop a profile, based on the general characteristics of invasive species and vulnerable ecosystems, in order to predict, to the extent practical, whether a species planned for importation is likely to invade a particular aquatic ecosystem if introduced. In developing the profile, the above agencies shall analyze the research conducted under section 5, and other research as necessary, to determine general species and ecosystem characteristics (taking into account the opportunity for introduction into any ecosystem) and circumstances that can lead to establishment. Based on the profile, the Task Force shall make recommendations to the Invasive Species Council as to what planned importations of nonnative aquatic organisms should be restricted. This profile shall be peer-reviewed.

(d) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated for carrying out this section and section 5 of this Act, and section 1102(b)(2) of the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (16 U.S.C. 4712(b)(2)) for each of the fiscal years 2004 through 2008–

(1) $4,000,000 for the Smithsonian Environmental Research Center;

(2) $11,000,000 for the United States Geological Survey (including activities through the Cooperative Fish and Wildlife Research Program), of which $6,500,000 shall be for the grant program under section 5(e), and of which $500,000 shall be for developing, maintaining, and updating the database under section 5(i); and

(3) $10,500,000 for the National Oceanic and Atmospheric Administration, of which $6,500,000 shall be for the grant program under section 5(e).

SEC. 7. DISSEMINATION.

(a) IN GENERAL.—The Invasive Species Council, in coordination with the Task Force and the administering agencies, shall be responsible for disseminating the information collected under this Act to the public, including Federal, State, and local entities, relevant policymakers, and private researchers with responsibility over or interest in aquatic invasive species.

(b) REPORT TO CONGRESS.—Not later than 3 years after the date of the enactment of this Act, the Invasive Species Council shall report actions and findings under section 6 to the Congress, and shall update this report once every 3 years thereafter, or more often as necessary.

(c) RESPONSE STRATEGY.—The Invasive Species Council, in coordination with the Task Force, the administering agencies, and other appropriate Federal and State agencies, shall develop and implement a national strategy for how information collected under this Act will be shared with Federal, State, and local entities with responsibility for determining response to the introduction of potentially invasive aquatic species, to enable those entities to better and more rapidly respond to such introductions.

(d) PATHWAY PRACTICES.—The Invasive Species Council, in coordination with the Task Force and the administering agencies, shall disseminate information to, and develop an ongoing educational program for, pathway users (including vendors and customers) on how their practices could be modified to prevent the intentional or unintentional introduction of nonnative aquatic species into aquatic ecosystems.

(e) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary of the Interior for each of the fiscal years 2004 through 2008 $500,000 for the Invasive Species Council for carrying out this section.

SEC. 8. TECHNOLOGY DEVELOPMENT, DEMONSTRATION, AND VERIFICATION.

(a) ENVIRONMENTALLY SOUND TECHNOLOGY DEVELOPMENT, DEMONSTRATION, AND VERIFICATION.—

(1) GRANT PROGRAM.—Not later than 1 year after the date of the enactment of this Act, the Environmental Protection Agency, acting through the Office of Research and Development, in consultation with the Army Corps of Engineers, the administering agencies, and the Task Force, shall develop and begin administering a grant program to fund research, development, demonstration, and verification of environmentally sound cost-effective technologies and methods to control and eradicate aquatic invasive species.

(2) PURPOSES.—Proposals funded under this subsection shall—

(A) seek to support Federal, State, or local officials' ongoing efforts to control and eradicate aquatic invasive species in an environmentally sound manner;

(B) increase the number of environmentally sound technologies or methods Federal, State, or local officials may use to control or eradicate aquatic invasive species;

(C) provide for demonstration or dissemination of the technology or method to potential end-users; and

(D) verify that any technology or method meets any appropriate criteria developed for effectiveness and environmental soundness by the Environmental Protection Agency.

(3) PREFERENCE.—The Administrator of the Environmental Protection Agency shall give preference to proposals that will likely meet any appropriate criteria developed for environmental soundness by the Environmental Protection Agency.

(4) MERIT REVIEW.—Grants shall be awarded under this subsection through a competitive, peer-reviewed process.

(5) REPORT.—Not later than 3 years after the date of the enactment of this Act, the Administrator of the Environmental Protection Agency shall prepare and submit a report to Congress on the program conducted under this subsection. The report shall include findings and recommendations of the Administrator with regard to technologies and methods.

(b) DISPERSAL BARRIER RESEARCH PROGRAM.—Not later than 1 year after the date of the enactment of this Act, the Assistant Secretary of the Army for the Corps of Engineers, in conjunction with the Fish and Wildlife Service and other appropriate Federal agencies and academic researchers, shall establish a research, development, and demonstration program to study environmentally sound methods and technologies to reduce dispersal of aquatic invasive species through interbasin waterways and assess the potential for using those methods and technologies in other waterways.

(c) SHIP PATHWAY TECHNOLOGY DEMONSTRATION.—

(1) REAUTHORIZATION OF PROGRAM.—Section 1301(e) of the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (16 U.S.C. 4741(e)) is amended by striking "$2,500,000" and inserting "$7,500,000 for each of the fiscal years 2004 through 2008".

(2) EXPANSION OF PROGRAM.—Section 1104(b) of the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (16 U.S.C. 4714(b)) is amended—

(A) by redesignating paragraphs (4) and (5) as paragraphs (5) and (6), respectively; and

(B) by inserting after paragraph (3) the following new paragraph:

"(4) ADDITIONAL PURPOSES.—The Secretary of the Interior and the Secretary of Commerce may also demonstrate and verify technologies under this subsection to monitor and control pathways of organism transport on ships other than through ballast water.".

(3) CRITERIA AND WORKSHOP.—Section 1104 of the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (16 U.S.C. 4714) is amended by adding at the end the following new subsections:

"(d) CRITERIA.—When issuing grants under this section, the National Oceanic and Atmospheric Administration shall give preference to those technologies that will likely meet the criteria laid out in any testing protocol developed by the Environmental Protection Agency Office of Research and Development's Environmental Technology Verification Program.

"(e) WORKSHOP.—The National Oceanic and Atmospheric Administration shall hold an annual workshop of principal investigators funded under this section and researchers conducting research directly related to ship pathway technology development, for information exchange, and shall make the proceedings widely available to the public.".

(d) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated for each of the fiscal years 2004 through 2008—

(1) $2,500,000 for the Environmental Protection Agency to carry out subsection (a); and

(2) $1,000,000 for the Army Corps of Engineers to carry out subsection (b).

SEC. 9. RESEARCH TO SUPPORT THE SETTING AND IMPLEMENTATION OF SHIP PATHWAY STANDARDS.

(a) RESEARCH PROGRAM.—The Coast Guard and the Environmental Protection Agency, in coordination with the National Oceanic and Atmospheric Administration, the Task Force, and other appropriate Federal agencies and academic researchers, shall develop a coordinated research program to support the promulgation and implementation of standards to prevent the introduction and spread of invasive species by ships that shall include—

(1) characterizing physical, chemical, and biological harbor conditions relevant to ballast discharge into United States waters to inform the design and implementation of ship vector control technologies and practices;

(2) developing testing protocols for determining the effectiveness of vector monitoring and control technologies and practices;

(3) researching and demonstrating methods for mitigating the spread of invasive species by coastal voyages, including exploring the effectiveness of alternative exchange zones in the near coastal areas and other methods proposed to reduce transfers of organisms;

(4) verifying the practical effectiveness of any type approval process to ensure that the process produces repeatable and accurate assessments of treatment effectiveness; and

(5) evaluating the effectiveness and residual risk and environmental impacts associated with any standard set with respect to the ship pathway through experimental research.

(b) PERFORMANCE TEST.—Within 1 year after the date of the enactment of this Act, the Coast Guard, in conjunction with the National Institute of Standards and Technology and the Maritime Administration, shall design a performance test for ballast water exchange such as a dye study to measure the effectiveness of ballast water exchange.

(c) NATIONAL ACADEMY STUDY.—The Secretary of the Department in which the Coast Guard is operating shall enter into an arrangement with the National Academy of Sciences under which the Academy shall—

(1) identify the relative risk of transfer of various taxonomic groups by different ship modes;

(2) assess the extent to which a ballast water standard that virtually eliminates the risk of introduction of invasive species by ballast water may relate to the risk of introductions by all ship modes, and explain the degree of uncertainty in such assessment; and

(3) recommend methods for reducing organism transfers by ships by addressing all parts and systems of ships and all related modes of transport of invasive species, and identify the research, development, and demonstration needed to improve the information base to support such methods, including economic information.

Not later than 2 years after the date of the enactment of this Act, the Secretary of the Department in which the Coast Guard is operating shall transmit to the Congress a report on the results of the study under this subsection.

(d) RECOMMENDATIONS.—Not later than the later of 1 year after the date of submission of the report under subsection (c), or 3 years after the date of the enactment of this Act, the Task Force, in conjunction with the Environmental Protection Agency, the administering agencies, and other appropriate Federal and State agencies and academic researchers, shall submit to the Coast Guard a report that describes recommendations for—

(1) a ship pathway treatment standard that incorporates all potential modes of transfer by ships; and

(2) methods for type approval and accurate monitoring of treatment performance that are simple and streamlined and follow established protocols.

(e) WORKING GROUP.—Not later than 2 years after the issuance by the Coast Guard of any standard relating to the introduction by ships of invasive species, the Coast Guard shall convene a working group including the Environmental Protection Agency, the administering agencies, and other appropriate Federal and State agencies and academic researchers, to evaluate the effectiveness of that standard and accompanying implementation protocols. The duties of the working group shall, at a minimum, include—

(1) reviewing the effectiveness of the standard in reducing the establishment of invasive species in aquatic ecosystems, taking into consideration the data collected under section 5; and

(2) developing recommendations to the Coast Guard for the revision of such standard and type approval process to ensure effectiveness in reducing introduc-

tions and accurate shipboard monitoring of treatment performance that is simple and streamlined, which shall be made widely available to the public.

(f) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated—

(1) for each of the fiscal years 2004 through 2008 $1,500,000 for the Coast Guard and $1,500,000 for Environmental Protection Agency to carry out subsection (a);

(2) for each of the fiscal years 2004 through 2006 $500,000 for the Coast Guard to carry out subsection (b); and

(3) for fiscal year 2004 $500,000 for the Coast Guard to carry out subsection (c), to remain available until expended.

SEC. 10. RESEARCH IN SYSTEMATICS AND TAXONOMY.

(a) IN GENERAL.—The National Science Foundation shall establish a program to award grants to researchers at institutions of higher education and museums to carry out research programs in systematics and taxonomy.

(b) GOALS.—The goals of the program under this section are to—

(1) encourage scientists to pursue careers in systematics and taxonomy to ensure a continuing knowledge base in these disciplines;

(2) ensure that there will be adequate expertise in systematics and taxonomy to support Federal, State, and local needs to identify species;

(3) develop this expertise throughout the United States with an emphasis on regional diversity; and

(4) draw on existing expertise in systematics and taxonomy at institutions of higher education and museums to train the next generation of systematists and taxonomists.

(c) CRITERIA.—Grants shall be awarded under this section on a merit-reviewed competitive basis. Emphasis shall be placed on funding proposals in a diverse set of ecosystems and geographic locations, and, when applicable, integrated with the United States Long Term Ecological Research Network. Preference shall be given to proposals that will include student participation, and to institutions and museums that actively train students to become experts in taxonomy and systematics.

(d) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the National Science Foundation for carrying out this section $2,500,000 each of the fiscal years 2004 through 2008.

SEC. 11. STATE PROGRAMS.

(a) PLAN.—The administering agencies, in cooperation with the appropriate State agencies, shall develop a plan to—

(1) conduct a survey of methods States and Federal agencies are using to control or eradicate aquatic invasive species;

(2) facilitate the exchange of information among States and Federal agencies on methods States or Federal agencies have found to be effective at controlling or eradicating aquatic invasive species and the costs of those methods; and

(3) evaluate the cost-effectiveness of the various methods States and Federal agencies are using to control or eradicate aquatic invasive species.

(b) REPORT.—Not later than one year after the date of enactment of this Act, the administering agencies shall jointly transmit to the Congress the plan described in subsection (a) and the expected costs of carrying out the plan.

II. PURPOSE OF THE BILL

The purpose of H.R. 1081, the Aquatic Invasive Species Research Act, is to establish and authorize appropriations for a marine and freshwater research, development, and demonstration programs to support efforts to prevent, control, and eradicate aquatic invasive species, as well as to educate citizens and stakeholders and restore ecosystems.

III. BACKGROUND AND NEED FOR THE LEGISLATION

Aquatic invasive species damage infrastructure, disrupt commerce, crowd out native species, reduce biodiversity and threaten human health. Non-native species have been brought into the U.S., both intentionally and unintentionally, since the European discovery of the New World. Trappers introduced nutria (a rodent similar to a muskrat) to bolster the domestic fur industry, others

introduced the purple loosestrife plant because it added rich color in gardens, but both have now become serious threats to wetlands. Many unintentional introductions have resulted from species hitching a ride in ships, crates, planes, or soil coming into the U.S. Zebra mussels, for example, came into the Great Lakes through ballast water from ships.

Most non-native species do not survive because the new environment does not meet the species' biological needs. In many cases, however, the new species will find favorable conditions, such as lack of natural enemies, or an environment that fosters propagation, that allow it to survive and thrive in a new ecosystem. Only a small fraction of these non-native species become "invasive species", which are defined as plants, animals, microorganisms or viruses that are: (1) non-native to the ecosystem under consideration, and (2) whose introduction causes or is likely to cause economic or environmental harm or harm to human health. However, this small fraction has caused enormous economic and environmental damage.

One example of an invasive species is the zebra mussel, which was introduced into the Great Lakes in the mid-1980s through the ballast water of ships. Ballast water is water carried by ships to provide stability and adjust a vessel's trim for optimal steering and propulsion. Ballast water is considered by many scientists to be the primary pathway by which aquatic invasive species are introduced into U.S. waters. Zebra mussels clog lakes and waterways and adversely affect fisheries, public water supplies, irrigation, water treatment systems, and recreational activities, and has been an immense financial burden on entities in the Great Lakes. In saltwater habitats, the European green crab has been associated with the demise of the soft-shell clam industry in New England, with an estimated cost to the industry of $44 million a year. While precise economic impacts are difficult to assess, a study by Cornell University scientists estimates that the total annual economic losses and associated control costs of invasive species (both aquatic and terrestrial) in the U.S. is about $137 billion a year.

Invasive species also cause environmental damage that is even more difficult to quantify. For example, sea lamprey control measures in the Great Lakes cost approximately $10 to $15 million annually. However, we do not have a good measure of the cost of lost fisheries due to this invader. In fact, invasive species are now the number two threat to endangered species, right behind habitat loss. Quantifying the loss due to extinction of these species is nearly impossible.

Congress has long recognized the damage that invasive species cause. One of the more recent congressional actions was the passage of the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990. This legislation established a Federal program to prevent the introduction of, and to control the spread of, unintentionally introduced aquatic nuisance species. In 1996, Congress amended the 1990 Act with the National Invasive Species Act (NISA). This legislation continued to focus on aquatic invasive species by creating a voluntary national ballast water management program and a mandatory ballast water management program for ships entering the Great Lakes. Ballast water management can be done in two ways: (1) ballast water can be exchanged at sea, re-

placing species rich water picked up at ports with open ocean water that contains far fewer organisms, and (2) ballast water can be treated with a technology, such as chlorination. To date, there are no treatment technologies widely used to treat ballast water. NISA also required the Coast Guard to study and report to Congress on the effectiveness of ballast exchange or other technologies in controlling invasive species.

However, NISA and the underlying 1990 legislation have been criticized for not going far enough to prevent the introduction of aquatic invasive species. Further, the agencies responsible for implementing the Act have been criticized for failing to carry out many of its provisions, including setting standards for ballast water treatment, conducting ecological assessments, and prescribing management actions. In response, agencies have argued that the law is ambitious and that funding has been inadequate. In addition, these failures have also been driven in part by a lack of scientific information on the underlying processes that lead to invasion.

The research that has been done has been largely reactive, focusing on how to control specific invasive species, such as the sea lamprey, once they are already established and causing harm. Once an invasive species is established, it is virtually impossible to eradicate and very difficult to control. Additional research on how to manage species at the earlier stages of the invasion process, when prevention, eradication and restoration are still possible, is critical and would allow for more proactive management. H.R. 1081 would provide a foundation for our understanding of how to prevent invasive species from ever entering U.S. waters.

For example, it is difficult to know how to prevent invasive species from entering the United States without a good understanding of how they get here, an understanding that H.R. 1081 would develop through the pathway surveys conducted in the bill. Planned importations of non-native species can be more effectively screened for potential invasives with a thorough understanding of the characteristics that make a species invasive and an ecosystem vulnerable, a profile that would be created in this legislation. Finally, without good technologies to eradicate species in ballast water, it is difficult to prevent invasive species from entering U.S. waters through ships' ballasts (a known pathway). H.R. 1081 authorizes the development and demonstration of such technologies. These are just a few of the critical management questions that will be informed by research conducted under this legislation.

One of the major barriers to the prevention of the introduction of invasive species is the lack of a clear, mandatory standard for the treatment of ballast water in ships to prevent introduction in non-native species. It is the responsibility of the Coast Guard to set this standard, however, it has been difficult to determine an environmentally protective standard without adequate research on how the risk of establishment relates to the quantity of introduced species, or conditions of introduction. Section 9 of H.R. 1081 establishes a research program to support the setting, implementation and evaluation of ship pathway standards.

Invasive species enter U.S. waters every day bringing with them greater environmental and economic harm. While the invasive species cost the United States billions in damages, very little is in-

vested in how to prevent introduction and avoid this damage. More research, targeted at how to prevent these species from arriving in the first place, is critical to a more proactive and cost-effective invasive species policy.

IV. Summary of Hearings

July 26, 2001: Combating the Invaders: Research on Non-Native Species

On July 26, 2001, the Subcommittee on Environment, Technology and Standards held a hearing to receive testimony on Federal agencies' research on invasive species and how the National Invasive Species Council coordinates invasive species programs and activities among the Federal agencies. The Subcommittee reviewed the research provisions in the National Invasive Species Act of 1996 and the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990, and focused on how to update and improve them.

The Committee heard from: Panel 1: Peter Hoekstra, Congressman from Michigan. Panel 2: (1) Dr. David Evans, Assistant Administrator of the Office of Oceanic and Atmospheric Research, National Oceanic and Atmospheric Administration and Co-Chair of the Aquatic Nuisance Species Task Force; (2) Ms. Lori Williams, Executive Director of the National Invasive Species Council; (3) Dr. James T. Carlton, Professor of Marine Sciences at Williams College and Director of the Maritime Studies Program of Williams College and Mystic Seaport; (4) Dr. Stephen B. Brandt, Director of the Great Lakes Environmental Research Laboratory; (5) Mr. Scott Smith from the Washington State Department of Fish and Wildlife.

Noting that he had introduced legislation earlier in the year to address the introduction of non-native species to the Great Lakes through ballast water, Mr. Hoekstra expressed interest in working with the Subcommittee to develop legislation to combat non-native species and the ecological and economic damage they cause.

Current Federal research portfolio and research needs

Dr. Evans began by stressing that aquatic invasive species pose a severe threat to our Nation's ecological and socio-economic well-being. He described current agency-sponsored research and zebra mussels and aquatic invasive weeds, and said that the role of the Task Force is to coordinate research and to make information available to all stakeholders. He said that because the National Invasive Species Act focused largely on applied research, basic research questions, such as what makes a habitat vulnerable, or a species invasive, have yet to be addressed.

Dr. James T. Carlton described some recent invasions, such as the rapa whelk, in order to illustrate that research to prevent, understand and manage invasions is more pressing now than ever before. He noted that the role of universities is to define the basic science of invasions and to partner with government agencies and others to develop solutions. He pointed to the Ballast Water Management Demonstration Program as a successful example of this partnership. However, he also cautioned that the nation would only gain from research in proportion to how it is funded, and noted

that investment over the past ten years has been disproportionately low compared to the nature of the problem.

Ms. Lori Williams stated that an effective response to biological invasions must be coordinated, interdepartmental, and multi-jurisdictional. Further, coordinated research planning is essential to avoid unnecessary duplication of research efforts, to develop a coherent research plan, and to maximize collaborative synergy among researchers. She discussed the Invasive Species Council's Management Plan. The plan documents research needs, including additional research to assess the risk of non-native species becoming invasive, better baseline data and monitoring, and improved data on economic and environmental impacts of invasive species.

Dr. Stephen B. Brandt testified that over the past few decades, rates of invasion have accelerated. He stated that there is general agreement on research priorities. These should be focused on prevention of species invasion through ballast water, and on minimizing the ecological and economic impacts of invasive species. He also stated that a basic understanding of ecosystems and invasive species biology is essential to make management decisions effective to minimize the impact of invasive species.

Mr. Scott Smith offered a State perspective. He stressed that the States are very concerned about the accelerating rate of invasions, and that the States do not currently have the capacity to deal with invasive species. He urged better coordination with States in addressing the problem. One of the State of Washington's top research priorities is the development of ballast water treatment technologies. He stated that funds for this research should be available nationally. Finally, he stressed that research is necessary in order to allow managers to be proactive in preventing introductions of invasive species.

June 20, 2002: Research Priorities for Aquatic Invasive Species

On Thursday, June 20, 2002, the Subcommittee on Environment, Technology, and Standards of the House Science Committee held a hearing on research priorities to support States and the Federal government in their efforts to prevent, control and eradicate aquatic invasive species. The hearing examined gaps in our understanding of how invasive species are introduced and spread, and what research is required to enable State and Federal officials to better manage aquatic invasive species.

The hearing explored several questions, including:

- What research is needed to assess the relative risk of different invasion pathways?
- What types of monitoring (for example, ecological surveys and pathway surveys) would support early detection of, and rapid response to, the introduction of an invasive species?
- What research is required to enable more accurate characterization of the likelihood of a species invading once it is introduced?
- What research is required to support the development of standards for ballast water and "whole ship" treatment?
- What research programs should we pursue to develop new technologies to prevent the introduction of invasive species by ships entering or moving about U.S. waters and control them after they have arrived?

The witnesses included: Panel 1: Robert A. Underwood, Delegate from Guam. Panel 2: (1) Dr. David Lodge, Professor of Biological Sciences, University of Notre Dame; (2) Dr. L. David Smith, Assistant Professor of Biological Science, Smith College; (3) Dr. Gregory Ruiz, Senior Scientist, Smithsonian Environmental Research Center; (4) Ms. Allegra Cangelosi, Senior Policy Analyst, Northeast-Midwest Institute;

(5) Ms. Maurya Falkner, Staff Environmental Scientist, Marine Facilities Division of the California State Lands Commission and Program Manager, Ballast Water Management and Control Program.

Delegate Underwood testified on the significant environmental and economic damage caused on Guam by the non-native brown tree snake.

Research priorities

Dr. Lodge testified that the current Federal research portfolio is reactive and is focused on how to control species that are already invasive. However, once a species is already established, it is virtually impossible to eradicate. He stressed that research should focus on how to prevent species from being introduced in the first place, and how to detect their arrival early in order to eradicate them, allowing more proactive management. An ideal invasive species research portfolio would include a dramatically increased research effort relevant to steps that are early in the invasion process, such as pathway and ecological surveys.

Dr. David Smith described some of the work that he has been involved in to survey pathways, and testified that shipping is the primary vector for aquatic invasions. He stressed the need to include findings from such pathway studies in management plans.

Dr. Ruiz reiterated that prevention of new invasions through pathway management is a clear priority. Pathway management involves three fundamental components: pathway strength, pathway analysis, and pathway disruption. He stated that tracking invasions, through standardized field surveys, is of paramount importance to pathway management, both to measure pathway strength—or the source of new invasions—and to assess the long-term effect of management practices to disrupt pathways on invasion rates and patterns.

Ms. Cangelosi stressed that while ballast water exchange is currently required under the National Invasive Species Act (NISA), an interim, biologically based standard of treatment is needed until research can identify a final, environmentally protective "whole-ship" standard. She advocated research to directly support Coast Guard efforts to set such a final standard, and stated that an integrated shore-based and shipboard approach between the Environmental Protection Agency (EPA) and Coast Guard would afford economic and ecological research efficiencies and assure that methods developed would be environmentally sound. She stated that no additional research is needed in order to set an interim standard.

Upon questioning, all of the witnesses agreed that an interim standard should be set immediately.

Ms. Faulkner testified that development of new technologies for ballast water treatment has been hindered by the fact that alternatives to ballast water exchange have not been encouraged, and

interim and final treatment standard has not been identified, and research funding is inadequate. She called for increased funding for the development and testing of treatment technologies for ballast water, and stated that such a program also needs to focus on developing verification and certification programs, which can only exist when standards are identified.

November 14, 2002: House Resources Subcommittee on Fisheries Conservation, Wildlife and Oceans and the House Science Subcommittee on Environment, Technology, and Standards Joint Hearing on H.R. 5395 and H.R. 5396

On Thursday, November 14, 2002, the House Resources Subcommittee on Fisheries Conservation, Wildlife and Oceans and the House Science Subcommittee on Environment, Technology, and Standards held a legislative hearing on H.R. 5395, the National Aquatic Invasive Species Act, and H.R. 5396, the Aquatic Invasive Species Research Act.

Witnesses included: Panel 1: (1) Mr. Steve Williams, Director, U.S. Fish and Wildlife Service; (2) Mr. Timothy R.E. Keeney, Deputy Assistant Secretary for Oceans and Atmosphere, National Oceanic and Atmospheric Administration and co-chair of the Aquatic Nuisance Species Task Force; (3) Captain Michael W. Brown, Chief, Office of Operating and Environmental Standards, U.S. Coast Guard; and (4) Dr. Gregory M. Ruiz, Senior Scientist, Smithsonian Environmental Research Center. Panel 2: (1) Dr. Gabriela Chavarria, Policy Director for Wildlife Management, National Wildlife Federation; (2) Ms. Allegra Cangelosi, Senior Policy Analyst, Northeast-Midwest Institute; (3) Dr. Roger Mann, Professor, Virginia Institute for Marine Science; and (4) Dr. Phyllis Windle, Senior Scientist, Union of Concerned Scientists.

Support for the legislation

The witnesses all agreed that the underlying legislation should be reauthorized and were generally supportive of H.R. 5395 (the version of H.R. 1081 introduced in the 107th Congress). Mr. Williams stated that the introduction of invasive species has had a significant impact on our environment and that the Department of Interior supported the overall direction of the two bills. Mr. Keeney agreed and stated that the National Oceanic and Atmospheric Administration (NOAA) believes that the two bills address important gaps in the existing programs. He also stated that there is a need to develop an early detection and response mechanism, and to systematically assess eradication technologies. Mr. Williams reported that the Department of Interior was encouraged that the legislation emphasizes pathways other than ballast water. Both Mr. Williams and Mr. Keeney praised the bills for including strong research and education elements, calling these elements critical to control efforts. Mr. Williams stressed that efforts to deal with invasive species must be informed by research.

Dr. Ruiz testified in support of H.R. 5395. He began his testimony by outlining the difficulty in developing management strategies without more complete information about invasion ecology. He stated that there are gaps in the scientific data on the relationship between the introduction and establishment of species and that these gaps limit the predictive capability for both intentional and

unintentional introductions. Dr. Ruiz emphasized the need for research to measure changes in species transfer and invasion patterns to understand and predict the most serious threats for invasive introductions, both intentional and unintentional. Dr. Ruiz advocated two measures for addressing these problems. He sees the need for the development of an early detection system that would include a list of "target" species that have the potential for causing the most harm. More important, however, would be establishing a framework, consistent among geographical regions, to evaluate and approve intentional introductions.

Dr. Gabriela Chavarria testified that H.R. 5395 would fill a big gap in the Federal government's current invasive species programs. She stated that a comprehensive and thorough research, development, and demonstration program on aquatic invasive species needs to be conducted to better understand how aquatic invasive species are introduced and become established, and to support efforts to prevent their introduction and establishment and eradicate them.

Dr. Mann testified that H.R. 5395 provides a sound basis for new and continuing research priorities on a broad range of issues, and, importantly, includes research that is relevant to management practices.

Dr. Phyllis Windle testified that H.R. 5395 is an important step in combating the problems posed by invasive species. She stated that there are a number of specific provisions in the bill that biological scientists have long advocated as especially important. These include efforts to identify the high-risk pathways by which organisms reach the country and to develop the methods to limit them. She testified that the targeted research contained in H.R. 5395 is essential to implementing and evaluating management practices aimed at combating invasive species.

V. Committee Actions

The Environment, Technology, and Standards Subcommittee of the House Committee on Science heard testimony in the 107th Congress relevant to the programs authorized in H.R. 1081 at hearings held on July 26, 2001, June 20, 2002, and November 14, 2002.

On March 13, 2003 (108th Congress), the Environment, Technology and Standards Subcommittee met to consider H.R. 1081. No amendments were offered, and the Subcommittee favorably reported the bill by voice vote.

On June 4, 2003, the Full Science Committee met to consider H.R. 1081, and considered the following amendments to the bill:

1. Mr. Ehlers and Mr. Baird offered amendments en bloc to various portions of the bill. The en bloc amendments, which were accepted en bloc and agreed to by voice vote, comprised many technical, clarifying and conforming changes, as well as a number of substantive changes to the underlying bill as follows:

a. Required greater coordination with State agencies in implementing the provisions of the Act.

b. Altered the structure of the grant program authorized under section 5(e).

c. Authorized the development of a plan to conduct a survey of methods to control or eradicate aquatic invasive species,

evaluate the cost-effectiveness of these methods, and facilitate the exchange of information. Required that the plan be submitted to Congress within one year of the date of enactment.

2. Ms. Jackson Lee offered an amendment to include, to the maximum extent practicable, institutions attended by underrepresented populations in the grant program in section 5(e). The amendment was adopted by voice vote.

3. Mr. Wu offered an amendment to authorize $10 million to the Army Corps of Engineers Center for Aquatic Plant Research and Technology to conduct research, development and demonstration to control, prevent and eradicate invasive aquatic plants. The amendment was withdrawn.

Mr. Hall moved that the Committee favorably report the bill, H.R. 1081, as amended, to the House with the recommendation that the bill as amended do pass, and that the staff be instructed to make technical and conforming changes to the bill as amended and prepare the legislative report and that the Chairman take all necessary steps to bring the bill before the House for consideration. With a quorum present, the motion was agreed to by a voice vote.

VI. Summary of Major Provisions of the Bill

The major provisions of the legislation are:

- Authorization of an ecological and pathway research program, combining surveys, experimentation and analysis, run by the National Oceanic and Atmospheric Administration, the United States Geological Survey and the Smithsonian Environmental Research Center and including grants to State and academic researchers;
- Authorization of a development, demonstration and verification program run by the Environmental Protection Agency to develop environmentally sound technologies to control and eradicate invasive species;
- Reauthorization of the Ballast Water Technology Demonstration Program;
- Authorization of a joint Coast Guard and Environmental Protection Agency research program to support the Coast Guard's efforts to set mandatory standards for ships with respect to the introduction of non-native species;
- Authorization of a grant program within the National Science Foundation to support academic research in systematics and taxonomy.

VII. Section-by-Section Analysis

Section 1. Short title

This Act is named the "Aquatic Invasive Species Research Act."

Section 2. Findings

The legislation establishes several findings in support of the legislation, and finds that aquatic invasive species pose significant direct and indirect costs to the U.S. economy and environment, and that more research is needed to better direct Federal efforts toward effectively preventing the introduction of invasive species.

Section 3. Definitions

The administering agencies of the Act are defined as the National Oceanic and Atmospheric Administration, the Smithsonian Environmental Research Center and the United States Geological Survey.

The following additional terms are defined: aquatic ecosystem, ballast water, invasion, invasive species, Invasive Species Council, pathway, species, task force, and type approval.

Section 4. Consultation and cooperation

The administering agencies shall enter into a memorandum of agreement regarding implementation of this Act. In carrying out the Act, they shall consult with the Aquatic Nuisance Species Task Force, the Invasive Species Council, the Environmental Protection Agency and other appropriate State and Federal agencies, and shall cooperate with academic researchers.

Section 5. Ecological and pathway research

The administering agencies shall conduct surveys of ecosystems and of pathways (such as ships' ballast water) by which invasive species enter U.S. waters in order to track the introduction of invasive species. They shall also conduct experiments to understand the relationship between the conditions under which an invasive species is introduced and the likelihood that it will become established, and maintain a database of all of the information gathered under this section. Ecosystem surveys will review the patterns and rates of invasion at the site, track the establishment of species in ecosystems, monitor the circumstances accompanying that establishment, and document factors that may influence an ecosystem's vulnerability to invasion. Pathway surveys will identify the species being introduced through a given pathway, the quantity being introduced, and handling practices that contribute to the introduction. In carrying out this program the administering agencies will develop standardized protocols for carrying out the surveys and will coordinate their efforts to establish long-term survey sites to collect strong baseline information. A grant program is established to fund academic researchers and State agencies to carry out the surveys at diverse sites distributed geographically around the country.

Section 6. Analysis

The administering agencies shall analyze the survey and experimental results collected under Section 5. Specifically, they will, among other things, identify the highest risk pathways, identify handling practices within pathways that contribute to introductions, and evaluate how much effort is required in reducing introductions for various taxonomic groups to reduce the risk that they will become established. The agencies shall recommend and review pathway management programs to reduce introductions of invasive species. A profile, based on information about species characteristics, ecosystem characteristics and environmental circumstances that favor invasion, will be developed to predict, to the extent practical, whether a species planned for importation is likely to invade a particular ecosystem.

Authorization of Appropriations.—To carry out Sections 5 and 6 for FY04 through FY08, the National Oceanic and Atmospheric Administration is authorized $17 million per year ($13 million of which is for the grant program), the Smithsonian Environmental Research Center is authorized $4 million per year, and the United States Geological Survey is authorized $4.5 million per year ($500,000 million of which is to administer the database).

Section 7. Dissemination

The National Invasive Species Council shall disseminate the information developed under Section 6 to relevant audiences. This includes a report to Congress, a mechanism to provide survey findings to support rapid response efforts, and dissemination to users of the various pathways invasive species exploit of information regarding how their practices should be modified to prevent the introduction of non-native species. The National Invasive Species Council is authorized for FY04 through FY08 $500,000 million per year.

Section 8. Technology development and demonstration

The Act establishes and expands several programs to develop technologies to prevent, control and eradicate invasive species. These include (authorizations are for FY04 through FY08):

- The creation of an Environmental Protection Agency grant program to fund research, development, demonstration and verification of a suite of environmentally sound technologies to control and eradicate invasive species (authorized at $2.5 million per year).
- The creation of an Army Corps of Engineers dispersal barrier research program (authorized at $1 million per year).
- The expansion of the Ballast Water Technology Demonstration Program to include the demonstration of technologies to treat all ship pathways of introduction (including hull fouling) (authorized at $7.5 million per year).

Section 9. Research to support the setting and implementation of standards

The Act establishes a research program to support the setting, implementation and evaluation of standards for treatment of ship pathways of introduction. This includes:

- The creation of a Coast Guard and Environmental Protection Agency research program to conduct experiments and answer relevant policy questions associated with standards and their implementation, such as the identification of possible circumstances in which a ship may encounter invasive species and in which a treatment technology must be effective (authorized at $1.5 million for Environmental Protection Agency and $1.5 million for Coast Guard per year for FY04 through FY08).
- Coast Guard research to design a performance test for ballast water exchange (authorized at $500,000 million per year for FY04 through FY06).
- A study by the National Academy of Sciences to develop recommendations for a ballast water discharge standard (authorized at $500,000 for FY04).

• An inter-agency working group to evaluate the effectiveness of the standard and make recommendations for revision.

Section 10. Research in systematics and taxonomy

The National Science Foundation shall establish a competitive, peer-reviewed program to award grants to researchers at institutions of higher education and museums to carry out research in systematics and taxonomy. The program is authorized at $2.5 million per year for FY04 through FY08.

Section 11. State programs

The administering agencies, in cooperation with State agencies, shall develop a plan to conduct a survey of control and eradication methods, facilitate the exchange of information on effective methods and the costs of those methods, and evaluate the cost-effectiveness of various methods, and shall transmit this plan to Congress.

VIII. Committee Views

Investment in invasive species R&D

It is the Committee's view that the United States has underinvested in Research and Development (R&D) on aquatic invasive species. Specifically, more R&D funding should be focused on understanding the earliest stages of invasions. This will inform Federal, State and local managers who seek to prevent aquatic invasive species from entering U.S. waters and to eradicate them quickly upon arrival. This view is embodied in the comprehensive R&D program authorized by this legislation.

While there has been great focus on the Great Lakes and marine ecosystems with respect to invasive species, the Committee also recognizes the significant problems experienced in many of the nation's rivers, streams, and lakes due to invasive aquatic plants. The Committee intends to have the interagency programs authorized in this bill address the problems of aquatic invasive plants by drawing upon the expertise and experience of Federal programs already in existence such as the Center for Aquatic Plant Research and Technology, and their State and local cooperating organizations. The research programs authorized in this Act should be national in scope and strive for balanced coverage of the problems of aquatic invasive species that impact all waters of the United States.

Section 4. Coordination and implementation

It is the Committee's view that the administering agencies should work closely in implementing this Act with those who are primarily responsible for the management of invasive species. This includes both Federal agencies, including the Environmental Protection Agency and Fish and Wildlife Service, as well as State and local agencies, which ultimately perform the bulk of invasive species management.

The Committee believes that the memorandum of understanding required under this section should cover all of the duties assigned to the administering agencies, including the development of surveys and protocols, administration of the grant program and the database, experimentation and analysis. In developing the memorandum of understanding, the administering agencies should focus

on assigning duties that match the strengths of the particular agencies. For instance, the Smithsonian Environmental Research Center is primarily a research agency, and should be fully utilized for its research expertise in implementing all of the provisions listed above, including developing research protocols and solicitations for research grants. However, it should not have burdensome administrative responsibilities.

The Committee recognizes that academic researchers also have a wealth of experience in conducting research on invasive species, and believes they should be included in planning the research program and conducting research, as appropriate.

The Committee acknowledges that the Aquatic Nuisance Species Task Force and Invasive Species Council play an important role in coordinating the invasive species activities of the Federal government, both in terms of management and research. The Committee feels that to the extent practicable, in planning, coordinating and disseminating research authorized in this bill, the administering agencies should work with the Task Force and Council and seek to avoid duplication.

Section 5. Ecological and pathway research

The Committee understands that measuring invasion patterns and rates effectively requires the use of standardized, quantitative surveys that are replicated at many sites, and repeated over time. The Committee believes strongly that it is critical to establish a baseline of information that is comparable across ecosystems throughout the United States. However, the Committee recognizes that there is also information that will be location specific and not comparable. Therefore, while the Committee urges the administering agencies, through the workshop required by this Act and other activities, to determine the necessary baseline data and accompanying protocols that will ensure comparability and meet the goals of this section, the Committee understands that at some sites, surveys will include both standardized core elements (i.e., identical across all sites) and measures that are of particular interest at only a subset of sites.

While the surveys and protocols developed under this section are primarily intended for use in carrying out the research authorized under this Act, the Committee encourages the administering agencies to develop the surveys and protocols in such a way that a subset of the survey (and accompanying protocols) can be used more easily and broadly in early detection and rapid response efforts. The Committee also recognizes that for some survey elements there will be existing research protocols that are accepted by the scientific community, and encourages the administering agencies to use these protocols to the maximum extent practicable instead of creating new ones. In conducting the surveys, the Committee believes that existing data relevant to the surveys should be used to the maximum extent practical in lieu of new data collection. It is the view of the Committee that the administering agencies should work closely with Federal, State and local resource managers in order to ensure that data collected through the surveys will be relevant to their work.

Pathway surveys should cover, at a minimum, known pathways, including ships (ballast tank discharges and movements of species

on ship hulls); dispersal through canals and natural waterways; stocking of waterbodies by private and public agencies; aquaculture escapes; the aquarium trade; the watergarden trade; the live bait trade; the biological supply trade; and the live food trade.

The Committee recognizes that the bill gives discretion to the administering agencies in selecting the number and location of survey sites. The committee envisions that the administering agencies will use their directly appropriated funds to set up and operate some of the survey sites, and then will choose the remainder of the sites through the competitive grant program. One possibility is to have a small number of regionally-based "core" research sites run by the administering agencies, and then a larger number of "distributed" research sites, run by State agencies or academic researchers and awarded competitively through the grant program. One advantage of a network approach lies in the local implementation of surveys, drawing on local or regional expertise in a cost-effective manner. Further, the development of a distributed network with centralized services, including especially data management and analyses, would assure rapid access to current information which could inform analyses of invasion patterns and rates or rapid-response actions. It is the intention of the Committee that these sites be geographically distributed across the United States.

In designating the sites, and awarding funds through the grant program, it is the Committee's view that all three of the administering agencies should jointly make these decisions including reviewing grant proposals. The Committee does not intend to give direction as to the number of marine versus freshwater sites based on the amount of funding authorized to the National Oceanic and Atmospheric Administration and the United States Geological Survey respectively. The administering agencies are not eligible for funds awarded through the grant program.

The Act requires at least one workshop to support the development of the protocols and designs for the surveys. The Committee believes that it is critical that State and local employees responsible for the management of invasive species and academic researchers be included in this workshop.

It is the Committee's view that the experimentation required under subsection (h) should include lab and field-based experimentation. The administering agencies should ensure that experimentation and surveys support each other in accomplishing the goals of the Act.

The Committee underscores that the National Pathway and Ecological Surveys Database must be developed and maintained in consultation with the Smithsonian Environmental Research Center (which runs the Ballast Water Information Clearinghouse), the National Oceanic and Atmospheric Administration, and the Task Force.

Section 6. Analysis

The Committee expects that the analysis required under section 6 will be ongoing, and that the administering agencies will present an update of this analysis to Congress on an annual basis. It is intended that the administering agencies will use the results of the surveys and experimentation conducted under section 5, as well as other relevant research results in order to answer questions di-

rectly relevant to policy-makers. Policy-makers include both State and local employees directly responsible for managing invasive species, as well as Federal agencies and the Congress, responsible for setting national level policy.

Section 8. Technology development, demonstration, and verification

It is the Committee's view that the Ballast Water Management Demonstration Program has been underfunded in the past and recognizes that research needs far exceed past funding. However, the Committee also notes that the program requires better coordination, and therefore the Committee has required an annual workshop to ensure that research results are adequately communicated. It is the Committee's view that this should be an applied research program and that, in funding research and development proposals, the National Oceanic and Atmospheric Administration should give preference to proposals that build upon existing research and development. In addition, the Committee has expanded the program to focus on all ship pathways, since other pathways are proving to be important in the transport of species.

Section 9. Research to support the setting and implementation of standards

The Committee notes that in every rulemaking relating to the management of invasive species in ballast water, the Coast Guard has cited the need for more research to answer key science questions. This section is intended to support research that will assist the Coast Guard in developing, establishing, promulgating and implementing a risk-based, environmentally protective standard for the regulation of ship pathways. The Committee believes that the Coast Guard and Environmental Protection Agency should be equal partners in administering this research program.

IX. Cost Estimate

A cost estimate and comparison prepared by the Director of the Congressional Budget Office under section 402 of the Congressional Budget Act of 1974 has been timely submitted to the Committee on Science prior to the filing of this report and is included in Section X of this report pursuant to House Rule XIII, clause 3(c)(3).

H.R. 1081 does not contain new budget authority, credit authority, or changes in revenues or tax expenditures. Assuming that the sums authorized under the bill are appropriated, H.R. 1081 does authorize additional discretionary spending, as described in the Congressional Budget Office report on the bill, which is contained in Section X of this report.

X. Congressional Budget Office Cost Estimate

U.S. Congress,
Congressional Budget Office,
Washington, DC, June 18, 2003.

Hon. Sherwood L. Boehlert,
Chairman, Committee on Science,
House of Representatives, Washington, DC.

Dear Mr. Chairman: The Congressional Budget Office has prepared the enclosed cost estimate for H.R. 1081, the Aquatic Invasive Species Research Act.

If you wish further details on this estimate, we will be pleased to provide them. The CBO staff contacts are Deborah Reis and Jenny Lin.

Sincerely,

Douglas Holtz-Eakin,
Director.

Enclosure.

H.R. 1081—Aquatic Invasive Species Research Act

Summary: H.R. 1081 would authorize appropriations through fiscal year 2008 for programs to combat and research the spread of invasive species that are not native to U.S. waters. Assuming appropriation of the authorized amounts, CBO estimates that implementing this bill would cost $20 million in 2004 and $180 million over the 2004–2008 period. An additional $35 million would be spent after 2008. Enacting the bill would not affect direct spending or revenues.

The bill contains no new intergovernmental or private-sector mandates as defined in the Unfunded Mandates Reform Act (UMRA) and would impose no costs on state, local, or tribal governments.

H.R. 1081 would direct eight federal agencies to conduct research programs to detect, control, and prevent nonnative species in marine and freshwater systems within the United States. These research programs would assess the rates and patterns of the introduction and spread of such species, develop protocols for conducting ecological surveys, develop and maintain a national database of survey information, and promulgate standards to prevent further incursions. The bill also would authorize grant programs to develop methods and technologies to control and eradicate existing species.

Estimated cost to the Federal Government: The estimated budgetary impact of H.R. 1081 is shown in the following table. The costs of this legislation fall within budget function 300 (natural resources and environment).

	By fiscal year, in millions of dollars—				
	2004	2005	2006	2007	2008
CHANGES IN SPENDING SUBJECT TO APPROPRIATION					
Authorization Level [1]	44	43	43	43	43
Estimated Outlays	20	30	40	45	45

[1] For fiscal year 2003, $2.55 million was appropriated to the National Oceanic and Atmospheric Administration for a ballast water management demonstration program. Other programs authorized by H.R. 1081 would be new federal activities.

Basis of estimate: For this estimate, CBO assumes that the amounts authorized by the legislation will be appropriated for each

fiscal year and that outlays will follow historical spending patterns for similar activities. The estimate is based on information provided by the National Oceanic and Atmospheric Administration, the U.S. Coast Guard, and other federal agencies.

Intergovernmental and private-sector impacts: H.R. 1081 contains no intergovernmental or private-sector mandates as defined in UMRA and would impose no costs on state, local, or tribal governments.

Estimate prepared by: Federal Costs: Deborah Reis and Jenny Lin; Impact on State, Local, and Tribal Governments: Majorie Miller; and Impact on the Private Sector: Cecil McPherson.

Estimate approved by: Robert A. Sunshine, Assistant Director for Budget Analysis.

XI. Compliance With Public Law 104–4

H.R. 1081 contains no unfunded mandates.

XII. Committee Oversight Findings and Recommendations

The Committee on Science's oversight findings and recommendations are reflected in the body of this report.

XIII. Statement on General Performance Goals and Objectives

Pursuant to rule XIII, clause 3(c)(4) of the Rules of the House of Representatives the general performance goals and objectives of H.R. 1081 are to conduct research, development and demonstration in order to support efforts to prevent, control, and eradicate aquatic invasive species, as well as to educate citizens and stakeholders and restore ecosystems.

XIV. Constitutional Authority Statement

Article I, section 8 of the Constitution of the United States grants Congress the authority to enact H.R. 1081.

XV. Federal Advisory Committee Statement

H.R. 1081 does not establish nor authorize the establishment of any advisory committee.

The Committee finds that H.R. 1081 does relate to the terms and conditions of employment or access to public services or accommodations within the meaning of section 102(b)(3) of the Congressional Accountability Act (Public Law 104–1).

XVI. Congressional Accountability Act

The Committee finds that H.R. 1081 does not relate to the terms and conditions of employment or access to public services or accommodations within the meaning of section 102(b)(3) of the Congressional Accountability Act (Public Law 104–1).

XVII. Statement on Preemption of State, Local, or Tribal Law

This bill is not intended to preempt any State, local, or tribal law.

XVIII. CHANGES IN EXISTING LAW MADE BY THE BILL, AS REPORTED

In compliance with clause 3(e) of rule XIII of the Rules of the House of Representatives, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italic, existing law in which no change is proposed is shown in roman):

NONINDIGENOUS AQUATIC NUISANCE PREVENTION AND CONTROL ACT OF 1990

* * * * * * *

TITLE I—AQUATIC NUISANCE PREVENTION AND CONTROL

* * * * * * *

Subtitle B—Prevention of Unintentional Introductions of Nonindigenous Aquatic Species

* * * * * * *

SEC. 1102. NATIONAL BALLAST WATER MANAGEMENT INFORMATION.

(a) * * *

(b) ECOLOGICAL AND BALLAST WATER DISCHARGE SURVEYS.—

(1) * * *

(2) BALLAST WATER DISCHARGE SURVEYS.—

(A) * * *

(B) REQUIREMENTS FOR SURVEYS.—In conducting the surveys under this paragraph, the Secretary shall—

(i) * * *

[(ii) assess the effectiveness of voluntary guidelines issued, and regulations promulgated, under this subtitle in altering ballast water discharge practices to reduce the probability of accidental introductions of aquatic nuisance species.]

(ii) examine other potential modes for the introduction of nonnative aquatic species by ship, including hull fouling.

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SEC. 1104. BALLAST WATER MANAGEMENT DEMONSTRATION PROGRAM.

(a) * * *

(b) DEMONSTRATION PROGRAM.—

(1) * * *

* * * * * * *

(4) ADDITIONAL PURPOSES.—The Secretary of the Interior and the Secretary of Commerce may also demonstrate and verify technologies under this subsection to monitor and control path-

ways of organism transport on ships other than through ballast water.

[(4)] *(5)* SELECTION OF TECHNOLOGIES AND PRACTICES.—In selecting technologies and practices for demonstration under this subsection, the Secretary of the Interior and the Secretary of Commerce shall give priority consideration to technologies and practices identified as promising by the National Research Council Marine Board of the National Academy of Sciences in its report on ships' ballast water operations issued in July 1996.

[(5)] *(6)* REPORT.—Not later than 3 years after the date of enactment of the National Invasive Species Act of 1996, the Secretary of the Interior and the Secretary of Commerce shall prepare and submit a report to the Congress on the demonstration program conducted pursuant to this section. The report shall include findings and recommendations of the Secretary of the Interior and the Secretary of Commerce concerning technologies and practices.

* * * * * * *

(d) CRITERIA.—When issuing grants under this section, the National Oceanic and Atmospheric Administration shall give preference to those technologies that will likely meet the criteria laid out in any testing protocol developed by the Environmental Protection Agency Office of Research and Development's Environmental Technology Verification Program.

(e) WORKSHOP.—The National Oceanic and Atmospheric Administration shall hold an annual workshop of principal investigators funded under this section and researchers conducting research directly related to ship pathway technology development, for information exchange, and shall make the proceedings widely available to the public.

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Subtitle D—Authorizations of Appropriation

SEC. 1301. AUTHORIZATIONS.

(a) * * *

* * * * * * *

(e) BALLAST WATER MANAGEMENT DEMONSTRATION PROGRAM.—There are authorized to be appropriated [$2,500,000] *$7,500,000 for each of the fiscal years 2004 through 2008* to carry out section 1104.

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XIX. COMMITTEE RECOMMENDATIONS

On June 4, 2003 a quorum being present, the Committee on Science favorably reported the Aquatic Invasive Species Research Act, by a voice vote, and recommended its enactment.

XX. PROCEEDINGS OF THE MARKUP BY THE SUBCOMMITTEE ON ENVIRONMENT, TECHNOLOGY, AND STANDARDS ON H.R. 1081, AQUATIC INVASIVE SPECIES RESEARCH ACT

THURSDAY, MARCH 13, 2003

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENVIRONMENT, TECHNOLOGY,
AND STANDARDS,
COMMITTEE ON SCIENCE,
Washington, DC.

The Subcommittee met, pursuant to call, at 10:11 a.m., in Room 2318 of the Rayburn House Office Building, Hon. Vernon J. Ehlers [Chairman of the Subcommittee] presiding.

Mr. EHLERS. Good morning. I would like to call the Subcommittee to order. I apologize for the delay in starting, but because this is a markup, we need a sufficient number of Members here for that. And also, I was delayed in a meeting with the Director, Office of Management and Budget, as were a few other Members here.

Pursuant to notice, the Subcommittee on Environment, Technology and Standards is meeting today to consider the following measure: H.R. 1081, the Aquatic Invasive Species Research Act. I ask unanimous consent for the authority to recess the Subcommittee at any point, and without objection, so ordered.

I will begin with my opening remarks. And before we turn to our new Ranking Member, whom I will welcome in the hearing portion of this meeting, welcome to the first meeting of the Environment, Technology, and Standards Subcommittee. We are off to a fast start in this Congress, as we will be reviewing two important matters today. The first item of business is marking up legislation I authored with Congressman Gilcrest and Baird to further research on aquatic invasive species. After the markup, we will hold the hearing reviewing research on harmful algal blooms and hypoxia.

And I just wanted to mention, I just mentioned to Congressman Gilcrest, as a co-sponsor of this, that I would like to inform everyone with some sad news that Congressman Gilcrest's father passed away two days ago, and he will not be able to be present here. And on behalf of the Subcommittee, and I am sure the full Committee, we want to extend to him and his family our deepest sympathies for that tragedy.

Before we begin the markup, let me take care of a few housekeeping items. I want to congratulate Congressman Udall for taking over the reins as the Ranking Minority Member of the Subcommittee. In the last Congress, I worked very closely with your predecessor, and I look forward to having an equally close, if not more close, working relationship with you. It is good to have a Ranking Member I can look up to in several ways, and I look forward to a fruitful relationship with you, Mr. Udall.

I also want to welcome all of the Members who have joined us on this Subcommittee and let you know my door and my ears are always open for ideas or suggestions that you have about what issues this Subcommittee should be reviewing. I would parenthetically insert here that we hope to also include some travel this year in investigating various problems, and any suggestions anyone has on that, please pass them on to me or on to the Chief of Staff of this Subcommittee, Eric Webster.

Now let us move on to the markup of the Aquatic Invasive Species Research Act. Any of you who were on this Subcommittee last year know that dealing with the threat posed by invasive species has always been a top priority of mine. Last Congress, we held three hearings dealing with this topic, all of which helped in the development of the legislation before us today.

Invasive species are a tremendous threat to our economy and environment. Researchers at Cornell University estimate that the total economic cost of invasive species to Americans is $137 billion, with a B, annually. Beyond economic impacts, invasive species cause ecological costs that are even more difficult to quantify. In fact, invasive species now are second only to habitat loss as threats to endangered species.

While there are many federal programs focused on addressing the threat of aquatic invasive species, the introduction of invasive species into U.S. waters is accelerating. Many of the failures of these programs are due to inadequate research, particularly on the means to prevent invasive species from being introduced in the first place. This point was clearly articulated to this Subcommittee last Congress by Dr. David Lodge, a professor at the University of Notre Dame, who found that we only spend about $27 million a year on aquatic invasive species research programs, only 22 percent of which is spent on prevention research. This is a very tiny fraction of the amount we spend annually to deal with species that have already invaded the United States.

The legislation before us corrects this fundamental problem by authorizing new research programs so that Federal, State, and local agencies can better understand how invasive species are coming into the United States and improve ways of dealing with them once they take hold in our environment.

There are four main programs authorized by this legislation. The first is a comprehensive, ecological and pathway research program run by the National Oceanic and Atmospheric Administration, the United States Geological Survey, and the Smithsonian Environmental Research Center so that policy makers will be able to assess how these species get into our waterways and whether or not management decisions are helping to reduce invasions. The second is a development, demonstration and verification program run by

the Environmental Protection Agency to develop environmentally sound technologies to control and eradicate invasive species so that Federal, State and local managers will have more tools to combat invasive species. The third is a research program to support the Coast Guard's efforts to reduce the threat that ships pose for the introduction of new species into U.S. waters. These efforts will spur the development of technology to prevent invasive species from entering U.S. waters. The final program is a grant program within the National Science Foundation to support academic research in systematics and taxonomy so that we will maintain U.S. expertise in these areas and enhance our ability to identify invaders once they arrive.

It is time to change our strategy in dealing with aquatic invasive species. It is time for Congress to realize that this threat continues to grow and will not go away unless we act. Finally, the time has come for us to move this legislation forward. Invasive species don't respect political boundaries or timelines, and they are arriving here even as we speak today.

I urge all of my colleagues to support this bill, and I look forward to their input during this markup. Let me also add that in addition to this bill, Congressman Gilcrest has sponsored, and I have worked with him as a co-sponsor of the bill, to reauthorize the current invasive species activities of the Federal Government and, in fact, improve them. We have been joined by Senator Collins and Senator Levin in introducing a bill that encompasses both of our bills. And we look forward to working with the Senate. We hope we will be able to transform these bills into law very quickly and that we will soon be able to attack the invasive species problem in a very direct, thoughtful, thoroughly researched manner.

I am now pleased to recognize Mr. Udall, the brand new Ranking Minority Member of this Subcommittee, for his opening statement. Mr. Udall.

[The prepared statement of Mr. Ehlers follows:]

PREPARED STATEMENT OF CHAIRMAN VERNON J. EHLERS

Good Morning! Welcome to the first meeting of the Environment, Technology and Standards Subcommittee. We are off to a fast start this Congress, as we will be reviewing two important matters today. The first item of business is marking up legislation I authored with Congressmen Gilchrest and Baird to further research on aquatic invasive species. After the markup, we will hold a hearing reviewing research on harmful algal blooms and hypoxia.

Before we begin the markup, let me take care of a few housekeeping items. I want to congratulate Congressman Udall for taking over the reigns as the Ranking Minority Member of the Subcommittee. Last Congress, I worked very closely with your predecessor, Mr. Barcia, and I look forward to having an equally close working relationship with you. I also want to welcome all the Members who have joined us on this subcommittee, and let you know that my door is always open for ideas or suggestions you have about what issues this subcommittee should be reviewing.

Last Congress, this subcommittee was very busy. We focused our energy, in a bipartisan manner, on issues upon which the American public demanded action and on which we could make a difference. As a result, we passed important legislation dealing with—to name just a few items—cyber security, research on voting standards and equipment, reforms to the Sea Grant Program, improving manufacturer's supply chains, improving the flood warning system, and improving science at the Environmental Protection Agency.

I expect that we will be just as busy this Congress. We will review issues such as—again, just to name a few—legislation to reauthorize and improve the harmful algal bloom research program, legislation to reauthorize the transportation research and development programs created under the Transportation Equity Act for the 21st

Century, climate change research, the laboratory programs at the National Institute of Standards and Technology (which I know is near and dear to Mr. Udall's heart), and science programs at the Environmental Protection Agency.

Now let us move on to the markup of the Aquatic Invasive Species Research Act. Any of you who were on this subcommittee last year know that dealing with the threat posed by invasive species has always been a top priority of mine. Last Congress, we held three hearings dealing with this topic, all of which helped in the development of the legislation before us today.

Invasive species are a tremendous threat to our economy and environment. Researchers at Cornell University estimate that the total economic cost of invasive species to Americans is $137 billion annually. In the Great Lakes basin alone, various entities have spent an estimated $3 billion over the past decade in cleaning water intake pipes, purchasing filtration equipment and other efforts to fight the zebra mussel infestation. Beyond economic impacts, invasive species cause ecological costs that are even more difficult to quantify. In fact, invasive species now are second only to habitat loss as threats to endangered species.

While there are many federal programs focused on addressing the threat of aquatic invasive species, the introduction of invasive species into U.S. waters is accelerating. Many of the failures of these programs are due to inadequate research, particularly on how to prevent invasive species from being introduced in the first place. This point was clearly articulated to this subcommittee last Congress by Dr. David Lodge, a professor at the University of Notre Dame, who found that we only spend about $27 million a year on aquatic invasive species research programs, only 22 percent of which is spent on prevention research. This is a tiny fraction of the amount we spend annually to deal with species that have already "invaded" the U.S. The legislation before us corrects this fundamental problem by authorizing new research programs so that Federal, State and local agencies can better understand how invasive species are coming into the United States, and improve ways of dealing with them once they take hold in our environment.

There are four main programs authorized by this legislation. The first is a comprehensive ecological and pathway research program, run by the National Oceanic and Atmospheric Administration, the United States Geological Survey and the Smithsonian Environmental Research Center, so that policy-makers will be able to assess how these species get into our waterways and whether or not management decisions are helping to reduce invasions. The second is a development, demonstration and verification program run by the Environmental Protection Agency to develop environmentally sound technologies to control and eradicate invasive species, so that Federal, State and local managers will have more tools to combat invasive species. The third is a research program to support the Coast Guard's efforts to reduce the threat that ships pose for the introduction of new species into U.S. waters. These efforts will spur the development of technology to prevent invasive species from entering U.S. waters. The final program is a grant program within the National Science Foundation to support academic research in systematics and taxonomy, so that we will maintain U.S. expertise in these areas and enhance our ability to identify invaders once they arrive.

It is time to change our strategy in dealing with aquatic invasive species. It is time for Congress to realize that this threat continues to grow and will not go away unless we act. Finally the time has come for us to move this legislation forward—invasive species don't respect political boundaries or timelines, and they are arriving here even as we speak today. I urge all of my colleagues to support this bill and I look forward to their input during this markup.

Mr. UDALL. Thank you, Mr. Chairman. And I want you to know I appreciate your kind words. And let us set the record straight: I look up to you when it comes to matters of science, given your great background in the field. And I do look forward to some collaborative efforts in the future on behalf of the Subcommittee and on behalf of the Committee, and I wanted to thank you here today for the journey you made out to my hometown of Boulder last year for an important Congressional delegation trip. And I know we have talked about some future travels we can make together to look at the state of science, and particularly the Subcommittee portfolio around the country. I hope we don't have the same kind of experience we had when we traveled to Turkey late last year where our airplane had to make two or three return trips to Gan-

der, Newfoundland because of fueling problems, but we survived that great journey together.

I would tell the assembled audience that this Subcommittee has been one of the most productive in the Congress, and I anticipate it will be so in this Congress. We are pleased to—on the Democratic side, to have been joined by two new Members of the Science Committee, Congressman Miller from North Carolina, who is obviously busy this morning, but I look forward to his productive involvement. And we are joined by Congressman Lincoln Davis of Tennessee, and I wanted to welcome both of them to the Subcommittee.

As the Chairman mentioned, we have quite a great deal of business this morning within the House, so I want to be brief. The bill before us addresses an issue, as the Chairman mentioned, that affects every state in the Nation: invasive species. Regardless of the billions of dollars that are lost each year due to invasive species, research monitoring and eradication have been and continue to be under-funded. Today's bill is a step in the right direction in addressing the research elements of an aquatic invasive species program.

Because Members on our side were just appointed last week, we have not had time to adequately circulate the bill among their constituencies. So therefore today we will not be offering any amendments, but I wanted to note that our Members may offer amendments at the full Committee markup, and I want to assure Chairman Ehlers that we will work with him and his staff as the bill moves forward.

With that, I would like to yield, Mr. Chairman, the balance of my time to my good friend Mr. Baird, who is the co-sponsor of the bill.

[The prepared statement of Mr. Udall follows:]

PREPARED STATEMENT OF REPRESENTATIVE MARK UDALL

Mr. Chairman, I want to join you in welcoming everyone this morning. And I want to welcome all the new Members to the Committee. Since I've served on this subcommittee it has been one of the most productive in the Congress and I anticipate that it will be so again this Congress.

I would like to introduce to introduce two new Members of the Science Committee—Brad Miller of North Carolina and Lincoln Davis of Tennessee.

I know that Members have markups in other Committees this morning, so I will be brief. The bill before us this morning addresses an issue that affects every state in the Nation—invasive species. Regardless of the billions of dollars that are lost each year due to invasive species, research, monitoring and eradication have been and continue to be under-funded. Today's bill is a step in the right direction in addressing the research elements of an aquatic invasive species program.

Because Democratic Members were just appointed last week, our Members have not had the time to circulate the bill among their constituencies. Today, we will not be offering any amendments, but I want to make clear that our Members may offer amendments at the Full Committee markup. I want to assure Chairman Ehlers that we will work with him and his staff as the bill moves forward.

And now I would like to yield the balance of my time to my good friend Mr. Baird who is a co-sponsor of this bill.

Mr. BAIRD. I thank my colleague and friend, Mr. Udall, and our good Chairman, Mr. Ehlers, for his long-standing interest in this. As I often say on this topic, it is easy as an elected official or politician to work on legislation that has large financial interests backing it or great, huge constituencies back home. But invasive species are the kind of quiet menace, which as the Chairman correctly

pointed out, cost our nation $120 billion a year, $137 billion a year, but people don't even know about it until the problem arises. What Mr. Ehlers's bill does, and the other bills we have been working on in this committee, are basically two things. They try to address the existing problems in invasive species, and they try to prevent new problems from arising by keeping new invasive species from arriving. This is a benefit in two ways. Exactly as the Chair and the Ranking Member pointed out, it helps protect our environment, and it helps protect our economy.

In my home state, we have a magnificent estuary called the Willapa Bay, which has been infested with spartina grass, and if we don't control that, we are going to soon have the Willapa Prairie instead of the Willapa Bay. And that is a central area for migrating bird habitat, salmon, oyster growing, and crab fishing. It is an absolutely fundamental, critical ecosystem to the Pacific Northwest. And this spartina grass, which I understand is not a problem here on the East Coast, but on the West Coast, it is a heck of a problem, is just really threatening a huge economic loss and an environmental devastation. We are trying to prevent one of Mr. Ehlers's good friends, the zebra mussel, from coming into our region and, because he knows well and I know well that the challenge this has wreaked on the Great Lakes Region and the Mississippi Basin, etcetera, we have just got to stop these organisms from coming in to begin with. And once they do get in, we must identify them quickly and eradicate them quickly, because most of these critters and plants have the potential to multiply exponentially.

So I commend the Chair and the Ranking Member and thank them for the opportunity to work on this, and I yield back my time.

Mr. EHLERS. I thank both gentlemen for their comments. And if we could only train zebra mussels to eat spartina grass, we would both be in good shape.

Without objection, all other Members may place opening statements in the record.

I will make one brief exception for Senator—pardon me, Congressman Smith, Chair of the Research Committee, for a brief opening statement.

Mr. SMITH. I don't know if this is going to work, Mr. Chairman, without a Ranking Member from Michigan, but——

Mr. EHLERS. Yes.

Mr. SMITH.—I am also delighted to be a co-sponsor of the bill. Of course Michigan with the zebra mussels, not aquatic, but the emerald ash boar from Asia just came in in some crates, so invasive species are something that need to be considered and evaluated.

And I need to leave in about 60 seconds, so thank you for the time.

[The prepared statement of Mr. Smith follows:]

PREPARED STATEMENT OF REPRESENTATIVE NICK SMITH

I am happy to be a co-sponsor of H.R. 1081, the Aquatic Invasive Species Research Act. This legislation is critically important for the environment and the economy.

Invasive aquatic species (IAS) inflict billions of dollars worth of damage every year. Foreign to the area that they inhabit, IAS disrupt the ecosystem leading to far reaching and often unexpected consequences. In the State of Michigan, zebra mussels native to Europe infest intake and discharge pipes from facilities that use Great Lakes water, requiring costly maintenance.

My district has been directly by a different type of invasive species. The Emerald Ash Borer, native to Asia, was discovered ravishing ash trees in southeast Michigan last summer. So far it has infested about 5.5 million trees and is expected to spread. Whether aquatic or not, these unwanted guests take a considerable toll on society. I feel that it is important that we all continue to work to control and eradicate all forms of harmful invasive species.

This legislation will provide the funding and coordination necessary to allow us to begin fighting IAS comprehensively. For the first time, we will be able to determine the exact routes that IAS take to get here so that new infestations can be prevented. H.R. 1081 will lead to the development of new, environmentally friendly methods for exterminating IAS. It will also establish a research project to come up with standards to eliminate the risk of ships transporting new species into our waters. And finally, a new grant program within the National Science Foundation will be funded to support academic research to make us better able to identify IAS after they arrive. I urge my colleagues to support H.R. 1081.

And I want to thank Chairman Ehlers for holding the additional hearing today to look for ways to combat the threat of harmful algal blooms (HAB) and hypoxia.

Protecting our water resources is particularly important to the people in my home state of Michigan. Michigan relies on the Great Lakes, as well as an abundance of inland lakes, rivers and streams for economic, agricultural, scientific and leisure purposes. HABs threaten this resource by damaging fisheries, closing beaches, and disrupting the ecosystem.

HABs are increasingly becoming a problem in the Great Lakes. However, research on freshwater HABs has fallen behind similar efforts targeting marine HABs. This committee should take into account the unique circumstances and consequences posed by each form of HAB, and support legislation that does the same.

One of the main problems that we face in fighting HABs is that it is still unclear what has triggered their increased rate of incidence. There is anecdotal evidence that aquatic invasive species (AIS) are contributing to this unfortunate trend. Earlier today, this committee approved legislation that would address the threats posed by AIS and I hope that similar attention will be paid to the problem of HABs.

Mr. EHLERS. Thank you. And we hope we may finish this before you leave. There are no amendments that have been offered, to the best of my knowledge. I am sorry. We will now consider H.R. 1081, the Aquatic Invasive Species Research Act.

[H.R. 1081 follows:]

108TH CONGRESS
1ST SESSION

H. R. 1081

To establish marine and freshwater research, development, and demonstration programs to support efforts to prevent, control, and eradicate invasive species, as well as to educate citizens and stakeholders and restore ecosystems.

IN THE HOUSE OF REPRESENTATIVES

MARCH 5, 2003

Mr. EHLERS (for himself, Mr. GILCHREST, Mr. BAIRD, Mr. HOEKSTRA, Mr. ORTIZ, Mrs. BIGGERT, Mr. KIRK, Mr. KILDEE, Mr. CAMP, Mr. MCHUGH, Mr. EMANUEL, Ms. SLAUGHTER, Mr. ROGERS of Michigan, Mr. ENGLISH, Mr. FARR, Mr. CUMMINGS, Mr. LEVIN, Mr. STUPAK, Mr. SCOTT of Virginia, Mr. ABERCROMBIE, Mr. QUINN, Mr. SMITH of Washington, Mr. GEORGE MILLER of California, Mrs. MALONEY, Mr. DINGELL, Ms. KAPTUR, Ms. LEE, Mr. SAXTON, Mr. DICKS, Ms. BORDALLO, Mr. VISCLOSKY, Mr. WALSH, Mr. UPTON, Mr. GILLMOR, Mr. SMITH of Michigan, Mr. CASE, Mr. BOEHLERT, Mr. BROWN of Ohio, Mr. GREENWOOD, Mr. PALLONE, Mr. MARKEY, Mr. DELAHUNT, Mr. CARDIN, Mr. ALLEN, Mrs. MILLER of Michigan, Mr. BLUMENAUER, Mr. INSLEE, Mr. HOUGHTON, Ms. MCCOLLUM, Mr. MCGOVERN, Mr. MCCOTTER, Ms. BALDWIN, Mr. LEACH, Mr. MCDERMOTT, Mr. NEAL of Massachusetts, Mr. KNOLLENBERG, Mr. TOWNS, Mr. HONDA, Mr. LIPINSKI, Mr. WEINER, Mr. KIND, Mr. EVANS, Ms. LOFGREN, Mr. JOHNSON of Illinois, Mr. KLECZKA, Mr. SIMMONS, Mr. FALEOMAVAEGA, and Mr. LATOURETTE) introduced the following bill; which was referred to the Committee on Science, and in addition to the Committees on Transportation and Infrastructure, Resources, and House Administration, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned

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A BILL

To establish marine and freshwater research, development, and demonstration programs to support efforts to prevent, control, and eradicate invasive species, as well as to educate citizens and stakeholders and restore ecosystems.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Aquatic Invasive Species Research Act".

SEC. 2. FINDINGS.

The Congress makes the following findings:

(1) Aquatic invasive species damage infrastructure, disrupt commerce, outcompete native species, reduce biodiversity, and threaten human health.

(2) The direct and indirect costs of aquatic invasive species to our Nation's economy number in the billions of dollars per year. In the Great Lakes region, approximately $3,000,000,000 dollars have been spent in the past 10 years to mitigate the damage caused by one invasive species, the zebra mussel.

(3) Recent studies have shown that, in addition to economic damage, invasive species cause enormous environmental damage, and have cited invasive species as the second leading threat to endangered species.

(4) Over the past 200 years, the rate of detected marine and freshwater invasions in North America has increased exponentially.

(5) The rate of invasions continues to grow each year.

(6) Marine and freshwater research underlies every aspect of detecting, preventing, controlling, and eradicating invasive species, educating citizens and stakeholders, and restoring ecosystems.

(7) Current Federal efforts, including research efforts, have focused primarily on controlling established invasive species, which is both costly and often unsuccessful. An emphasis on research, development, and demonstration to support efforts to prevent invasive species or eradicate them upon entry into United States waters would likely result in a more cost-effective and successful approach to combating invasive species through preventing initial introduction.

(8) Research, development, and demonstration to support prevention and eradication includes monitoring of both pathways and ecosystems to track the introduction and establishment of nonnative species, and development and testing of technologies to prevent introduction through known pathways.

(9) Therefore, Congress finds that it is in the United States interest to conduct a comprehensive and thorough research, development, and demonstration program on aquatic invasive species in order to better understand how aquatic invasive species are introduced and become established and to support efforts to prevent the introduction and establishment of, and to eradicate, these species.

SEC. 3. DEFINITIONS.

In this Act:

(1) ADMINISTERING AGENCIES.—The term "administering agencies" means——

(A) the National Oceanic and Atmospheric Administration (including the Great Lakes Environmental Research Laboratory);

(B) the Smithsonian Environmental Research Center; and

(C) the United States Geological Survey.

(2) AQUATIC ECOSYSTEM.—The term "aquatic ecosystem" means a fresh-water, marine, or estuarine environment (including inland waters and wetlands) located in the United States.

(3) BALLAST WATER.—The term "ballast water" means any water (with its suspended matter) used to maintain the trim and stability of a vessel.

(4) INVASION.—The term "invasion" means the introduction and establishment of an invasive species into an ecosystem beyond its historic range.

(5) INVASIVE SPECIES.—The term "invasive species" means a species——

(A) that is nonnative to the ecosystem under consideration; and

(B) whose introduction causes or may cause harm to the economy, the environment, or human health.

(6) INVASIVE SPECIES COUNCIL.—The term "Invasive Species Council" means the council established by section 3 of Executive Order No. 13112 (42 U.S.C. 4321 note).

(7) PATHWAY.—The term "pathway" means 1 or more routes by which an invasive species is transferred from one ecosystem to another.

(8) SPECIES.—The term "species" means any fundamental category of taxonomic classification or any viable biological material ranking below a genus or subgenus.

(9) TASK FORCE.—The term "Task Force" means the Aquatic Nuisance Species Task Force established by section 1201(a) of the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (16 U.S.C. 4721(a)).

(10) TYPE APPROVAL.—The term "type approval" means an approval procedure under which a type of system is certified as meeting a standard established pursuant to Federal law for a particular application.

SEC. 4. CONSULTATION AND COOPERATION.

(a) MEMORANDUM OF UNDERSTANDING.—The administering agencies shall enter into a memorandum of understanding regarding implementation of this Act.

(b) CONSULTATION.—In carrying out this Act, the administering agencies shall consult with——

(1) the Task Force and Invasive Species Council;

(2) the Environmental Protection Agency; and

(3) other appropriate Federal and State agencies.

(c) COOPERATION.—In carrying out this Act, the administering agencies shall contract, as appropriate, or otherwise cooperate with academic researchers.

SEC. 5. ECOLOGICAL AND PATHWAY RESEARCH.

(a) IN GENERAL.—The administering agencies shall develop and conduct a marine and fresh-water research program which shall include ecological and pathway surveys and experimentation to detect nonnative aquatic species in aquatic ecosystems and to assess rates and patterns of introductions of nonnative aquatic species in aquatic ecosystems. The goal of this marine and freshwater research program shall be to support efforts to prevent the introduction of, detect, and eradicate invasive species through informing early detection and rapid response efforts, informing relevant policy decisions, and assessing the effectiveness of implemented policies to prevent the introduction and spread of aquatic invasive species. Surveys and experiments under this subsection shall be commenced not later than 18 months after the date of the enactment of this Act.

(b) PROTOCOL DEVELOPMENT.—The administering agencies shall establish standardized protocols for conducting ecological and pathway surveys of nonnative aquatic species that are integrated and produce comparable data, and shall recommend a standardized approach for classifying species. For ecological surveys, two protocols shall be developed, one to support early detection surveys that may be conducted by Federal, State, or local agencies involved in the management of invasive species, and a second protocol to support the surveys conducted under subsection (a). Protocols shall, as practicable, be integrated with existing protocols and data collection methods. Upon the development of protocols to support early detection surveys, the Task Force shall make appropriate efforts to disseminate the protocols to appropriate Federal, State, and local entities. In developing the protocols under this subsection, the administering agencies shall draw on the recommendations gathered at the workshop under subsection (g). The protocols shall be peer reviewed, and revised as necessary. Protocols shall be completed within 1 year after the date of the enactment of this Act.

(c) ECOLOGICAL AND PATHWAY SURVEY REQUIREMENTS.—(1) Each ecological survey conducted under subsection (a) shall, at a minimum——

(A) document baseline ecological information of the aquatic ecosystem including, to the extent practicable, a comprehensive inventory of native species, nonnative species, and species of unknown origin present in the ecosystem, as well as the chemical and physical characteristics of the water and underlying substrate;

(B) for nonnative species, gather information to assist in identifying their life history, environmental requirements and tolerances, the historic range of their native ecosystems, and their history of spreading from their native ecosystems;

(C) track the establishment of nonnative species including information about the estimated population of nonnative organisms in order to allow an analysis of the probable date of introduction of the species; and

(D) identify the likely pathway of entry of nonnative species.

(2) Each pathway survey conducted under this section shall, at a minimum——

(A) identify what nonnative aquatic species are being introduced or may be introduced through the pathways under consideration;

(B) determine the quantities of organisms being introduced through the pathways under consideration; and

(C) determine the practices that contributed to or could contribute to the introduction of nonnative aquatic species through the pathway under consideration.

(d) NUMBER AND LOCATION OF SURVEY SITES.—The administering agencies shall designate the number and location of survey sites necessary to carry out marine and freshwater research required under this section. In establishing sites under this subsection or subsection (e), emphasis shall be on the geographic diversity of sites, as well as the diversity of the human uses and biological characteristics of sites.

(e) COMPETITIVE GRANT PROGRAM.—The administering agencies (acting through the National Oceanic and Atmospheric Administration) shall administer a program to award grants to academic institutions, State agencies, and other appropriate groups, in order to assist in carrying out subsections (b) and (h). This program shall be competitive, peer-reviewed, and merit-based.

(f) SHIP PATHWAY SURVEYS.—Section 1102(b)(2)(B)(ii) of the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (16 U.S.C. 4712(b)(2)(B)(ii)) is amended to read as follows:

"(ii) examine other potential modes for the introduction of nonnative aquatic species by ship, including hull fouling.".

(g) WORKSHOP.—In order to support the development of the protocols and design for the surveys under subsections (b) and (c), the administering agencies shall convene a workshop with appropriate researchers from Federal and State agencies and academic institutions to gather recommendations. The administering agencies shall make the results of the workshop widely available to the public. The workshop shall be held within 120 days after the date of the enactment of this Act.

(h) EXPERIMENTATION.—The administering agencies shall conduct laboratory and field-based marine and freshwater research experiments on a range of taxonomic groups to identify the relationship between the introduction and establishment of nonnative aquatic species, including those legally introduced, and the circumstances necessary for those species to survive and thrive.

(i) NATIONAL PATHWAY AND ECOLOGICAL SURVEYS DATABASE.——

(1) IN GENERAL.—The United States Geological Survey shall develop, maintain, and update, in consultation and cooperation with the Smithsonian Environmental Research Center, the National Oceanic and Atmospheric Administra-

tion, and the Task Force, a central, national database of information concerning information collected under this section.

(2) REQUIREMENTS.—The database shall——

(A) be widely available to the public;

(B) be updated not less than once a quarter;

(C) be coordinated with existing databases collecting similar information; and

(D) be, to the maximum extent practicable, formatted such that the data is useful for both researchers and Federal and State employees managing relevant invasive species programs.

SEC. 6. ANALYSIS.

(a) INVASION ANALYSIS.——

(1) IN GENERAL.—Not later than 3 years after the date of the enactment of this Act, and every year thereafter, the administering agencies shall analyze data collected under section 5 and other relevant research on the rates and patterns of invasions by aquatic invasive species in waters of the United States. The purpose of this analysis shall be to use the data collected under section 5 and other relevant research to support efforts to prevent the introduction of, detect, and eradicate invasive species through informing early detection and rapid response efforts, informing relevant policy decisions, and assessing the effectiveness of implemented policies to prevent the introduction and spread of invasive species.

(2) CONTENTS.—The analysis required under paragraph (1) shall include with respect to aquatic invasive species——

(A) an analysis of pathways, including——

(i) identifying, and characterizing as high, medium, or low risk, pathways regionally and nationally;

(ii) identifying new and expanding pathways;

(iii) identifying handling practices that contribute to the introduction of species in pathways; and

(iv) assessing the risk that species legally introduced into the United States pose for introduction into aquatic ecosystems;

(B) patterns and rates of invasion and susceptibility to invasion of various bodies of water;

(C) how the risk of establishment through a pathway is related to the identity and number of organisms transported;

(D) rates of spread and numbers and types of pathways of spread of new populations of the aquatic invasive species and an estimation of the potential spread and distribution of newly introduced invasive species based on their environmental requirements and historical distribution;

(E) documentation of factors that influence an ecosystem's vulnerability to a nonnative aquatic species becoming invasive;

(F) a description of the potential for, and impacts of, pathway management programs on invasion rates;

(G) recommendations for improvements in the effectiveness of pathway management;

(H) to the extent practical, a determination of the level of reduction in live organisms of various taxonomic groups required to reduce the risk of establishment to receiving aquatic ecosystems to an acceptable level; and

(I) an evaluation of the effectiveness of management actions (including any standard) at reducing species introductions and establishment.

(c) RESEARCH TO ASSESS THE POTENTIAL OF THE ESTABLISHMENT OF INTRODUCED SPECIES.—Within 2 years after the date of the enactment of this Act, the administering agencies shall develop a profile, based on the general characteristics of invasive species and vulnerable ecosystems, in order to predict, to the extent practical, whether a species planned for importation is likely to invade a particular aquatic ecosystem if introduced. In developing the profile, the above agencies shall analyze the research conducted under section 5, and other research as necessary, to determine general species and ecosystem characteristics (taking into account the opportunity for introduction into any ecosystem) and circumstances that can lead to establishment. Based on the profile, the Task Force shall make recommendations to the Invasive Species Council as to what planned importations of nonnative aquatic organisms should be restricted. This profile shall be peer-reviewed.

(d) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated for carrying out this section and section 5 of this Act, and section 1102(b)(2) of the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (16 U.S.C. 4712(b)(2)) for each of the fiscal years 2004 through 2008——

(1) $4,000,000 for the Smithsonian Environmental Research Center;

(2) $4,500,000 for the United States Geological Survey, of which $500,000 shall be for developing, maintaining, and updating the database under section 5(i); and

(3) $17,000,000 for the National Oceanic and Atmospheric Administration, of which $13,000,000 shall be for the grant program under section 5(e).

SEC. 7. DISSEMINATION.

(a) IN GENERAL.—The Invasive Species Council, in coordination with the Task Force and the administering agencies, shall be responsible for disseminating the information collected under this Act to Federal, State, and local entities, including relevant policymakers, and private researchers with responsibility over or interest in aquatic invasive species.

(b) REPORT TO CONGRESS.—Not later than 3 years after the date of the enactment of this Act, the Invasive Species Council shall report actions and findings under section 6 to the Congress, and shall update this report once every 3 years thereafter, or more often as necessary.

(c) RESPONSE STRATEGY.—The Invasive Species Council, in coordination with the Task Force, the administering agencies, and other appropriate Federal and State agencies, shall develop and implement a national strategy for how information collected under this Act will be shared with Federal, State, and local entities with responsibility for determining response to the introduction of potentially harmful nonnative aquatic species, to enable those entities to better and more rapidly respond to such introductions.

(d) PATHWAY PRACTICES.—The Invasive Species Council, in coordination with the Task Force and the administering agencies, shall disseminate information to, and develop an ongoing educational program for, pathway users (including vendors and customers) on how their practices could be modified to prevent the intentional or unintentional introduction of nonnative aquatic species into aquatic ecosystems.

(e) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated for each of the fiscal years 2004 through 2008 $500,000 for the Invasive Species Council for carrying out this section.

SEC. 8. TECHNOLOGY DEVELOPMENT, DEMONSTRATION, AND VERIFICATION.

(a) ENVIRONMENTALLY SOUND TECHNOLOGY DEVELOPMENT, DEMONSTRATION, AND VERIFICATION.——

(1) GRANT PROGRAM.—Not later than 1 year after the date of the enactment of this Act, the Environmental Protection Agency, acting through the Office of Research and Development, in consultation with the Army Corps of Engineers and the administering agencies, shall develop and begin administering a grant program to fund research, development, demonstration, and verification of environmentally sound cost-effective technologies and methods to control and eradicate aquatic invasive species.

(2) PURPOSES.—Proposals funded under this subsection shall——

(A) seek to support Federal, State, or local officials' ongoing efforts to control and eradicate aquatic invasive species in an environmentally sound manner;

(B) increase the number of environmentally sound technologies or methods Federal, State, or local officials may use to control or eradicate aquatic invasive species;

(C) provide for demonstration or dissemination of the technology or method to potential end-users; and

(D) verify that any technology or method meets any appropriate criteria developed for effectiveness and environmental soundness by the Environmental Protection Agency.

(3) PREFERENCE.—The Administrator of the Environmental Protection Agency shall give preference to proposals that will likely meet any appropriate criteria developed for environmental soundness by the Environmental Protection Agency.

(4) MERIT REVIEW.—Grants shall be awarded under this subsection through a competitive, peer-reviewed, merit-based process.

(5) REPORT.—Not later than 3 years after the date of the enactment of this Act, the Administrator of the Environmental Protection Agency shall prepare and submit a report to Congress on the program conducted under this subsection. The report shall include findings and recommendations of the Administrator with regard to technologies and methods.

(b) DISPERSAL BARRIER RESEARCH PROGRAM.—Not later than 1 year after the date of the enactment of this Act, the Assistant Secretary of the Army for the Corps of Engineers, in conjunction with the Fish and Wildlife Service and other appro-

priate Federal agencies and academic researchers, shall establish a research, development, and demonstration program to study environmentally sound methods and technologies to reduce dispersal of aquatic invasive species through interbasin waterways and assess the potential for using those methods and technologies in other waterways.

(c) SHIP PATHWAY TECHNOLOGY DEMONSTRATION.——

(1) REAUTHORIZATION OF PROGRAM.—Section 1301(e) of the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (16 U.S.C. 4741(e)) is amended by striking "$2,500,000" and inserting "$7,500,000 for each of the fiscal years 2004 through 2008".

(2) EXPANSION OF PROGRAM.—Section 1104(b) of the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (16 U.S.C. 4714(b)) is amended——

(A) by redesignating paragraphs (4) and (5) as paragraphs (5) and (6), respectively; and

(B) by inserting after paragraph (3) the following new paragraph:

"(4) ADDITIONAL PURPOSES.—The Secretary of the Interior and the Secretary of Commerce may also demonstrate and verify technologies under this subsection to monitor and control pathways of organism transport on ships other than through ballast water.".

(3) CRITERIA AND WORKSHOP.—Section 1104 of the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (16 U.S.C. 4714) is amended by adding at the end the following new subsections:

"(d) CRITERIA.—When issuing grants under this section, the National Oceanic and Atmospheric Administration shall give preference to those technologies that will likely meet the criteria laid out in any testing protocol developed by the Environmental Protection Agency Office of Research and Development's Environmental Technology Verification Program.

"(e) WORKSHOP.—The National Oceanic and Atmospheric Administration shall hold an annual workshop of principal investigators funded under this section and researchers conducting research directly related to ship pathway technology development, for information exchange, and shall make the proceedings widely available to the public.".

(d) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated for each of the fiscal years 2004 through 2008——

(1) $2,500,000 for the Environmental Protection Agency to carry out subsection (a); and

(2) $1,000,000 for the Army Corps of Engineers to carry out subsection (b).

SEC. 9. RESEARCH TO SUPPORT THE SETTING AND IMPLEMENTATION OF SHIP PATHWAY STANDARDS.

(a) RESEARCH PROGRAM.—The Coast Guard and the Environmental Protection Agency, in coordination with the National Oceanic and Atmospheric Administration, the Task Force, and other appropriate Federal agencies and academic researchers, shall develop a coordinated research program to support the promulgation and implementation of standards to prevent the introduction and spread of invasive species by ships that shall include——

(1) characterizing physical, chemical, and biological harbor conditions relevant to ballast discharge into United States waters to inform the design and implementation of ship vector control technologies and practices;

(2) developing testing protocols for determining the effectiveness of vector monitoring and control technologies and practices;

(3) researching and demonstrating methods for mitigating the spread of invasive species by coastal voyages, including exploring the effectiveness of alternative exchange zones in the near coastal areas and other methods proposed to reduce transfers of organisms;

(4) verifying the practical effectiveness of any type approval process to ensure that the process produces repeatable and accurate assessments of treatment effectiveness; and

(5) evaluating the effectiveness and residual risk and environmental impacts associated with any standard set with respect to the ship pathway through experimental research.

(b) PERFORMANCE TEST.—Within 1 year after the date of the enactment of this Act, the Coast Guard, in conjunction with the National Institute of Standards and Technology and the Maritime Administration, shall design a performance test for ballast water exchange such as a dye study to measure the effectiveness of ballast water exchange.

(c) NATIONAL ACADEMY STUDY.—The Secretary of the Department in which the Coast Guard is operating shall enter into an arrangement with the National Academy of Sciences under which the Academy shall——

(1) identify the relative risk of transfer of various taxonomic groups by different ship modes;

(2) assess the extent to which a ballast water standard that virtually eliminates the risk of introduction of invasive species by ballast water may relate to the risk of introductions by all ship modes, and explain the degree of uncertainty in such assessment; and

(3) recommend methods for reducing organism transfers by ships by addressing all parts and systems of ships and all related modes of transport of invasive species, and identify the research, development, and demonstration needed to improve the information base to support such methods, including economic information.

Not later than 2 years after the date of the enactment of this Act, the Secretary of the Department in which the Coast Guard is operating shall transmit to the Congress a report on the results of the study under this subsection.

(d) RECOMMENDATIONS.—Not later than the later of 1 year after the date of submission of the report under subsection (c), or 3 years after the date of the enactment of this Act, the Task Force, in conjunction with the Environmental Protection Agency, the administering agencies, and other appropriate Federal and State agencies and academic researchers, shall submit to the Coast Guard a report that describes recommendations for——

(1) a ship pathway treatment standard that incorporates all potential modes of transfer by ships; and

(2) methods for type approval and accurate monitoring of treatment performance that are simple and streamlined and follow established protocols.

(e) WORKING GROUP.—Not later than 2 years after the issuance by the Coast Guard of any standard relating to the introduction by ships of invasive species, the Coast Guard shall convene a working group including the Environmental Protection Agency, the administering agencies, and other appropriate Federal and State agencies and academic researchers, to evaluate the effectiveness of that standard and accompanying implementation protocols. The duties of the working group shall, at a minimum, include——

(1) reviewing the effectiveness of the standard in reducing the establishment of invasive species in aquatic ecosystems, taking into consideration the data collected under section 5; and

(2) developing recommendations to the Coast Guard for the revision of such standard and type approval process to ensure effectiveness in reducing introductions and accurate shipboard monitoring of treatment performance that is simple and streamlined, which shall be made widely available to the public.

(f) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated——

(1) for each of the fiscal years 2004 through 2008 $1,500,000 for the Coast Guard and $1,500,000 for Environmental Protection Agency to carry out subsection (a);

(2) for each of the fiscal years 2004 through 2006 $500,000 for the Coast Guard to carry out subsection (b); and

(3) for fiscal year 2004 $500,000 for the Coast Guard to carry out subsection (c), to remain available until expended.

SEC. 10. RESEARCH IN SYSTEMATICS AND TAXONOMY.

(a) IN GENERAL.—The National Science Foundation shall establish a program to award grants to researchers at institutions of higher education and museums to carry out research programs in systematics and taxonomy.

(b) GOALS.—The goals of the program under this section are to——

(1) encourage scientists to pursue careers in systematics and taxonomy to ensure a continuing knowledge base in these disciplines;

(2) ensure that there will be adequate expertise in systematics and taxonomy to support Federal, State, and local needs to identify species;

(3) develop this expertise throughout the United States with an emphasis on regional diversity; and

(4) draw on existing expertise in systematics and taxonomy at institutions of higher education and museums to train the next generation of systematists and taxonomists.

(c) CRITERIA.—Grants shall be awarded under this section on a merit-reviewed competitive basis. Emphasis shall be placed on funding proposals in a diverse set of ecosystems and geographic locations, and, when applicable, integrated with the

United States Long Term Ecological Research Network. Preference shall be given to proposals that will include student participation, and to institutions and museums that actively train students to become experts in taxonomy and systematics.

(d) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the National Science Foundation for carrying out this section $2,500,000 each of the fiscal years 2004 through 2008.

SECTION-BY-SECTION ANALYSIS

H.R. 1081, Aquatic Invasive Species Research Act

Section 1. Short Title

This Act is named the "Aquatic Invasive Species Research Act."

Section 2. Findings

The legislation establishes several findings in support of the legislation, and finds that aquatic invasive species pose significant direct and indirect costs to the U.S. economy and environment, and that more research is needed to better direct Federal efforts toward effectively preventing the introduction of invasive species.

Section 3. Definitions

The administering agencies of the Act are defined as the National Oceanic and Atmospheric Administration, the Smithsonian Environmental Research Center and the United States Geological Survey.

The following additional terms are defined: aquatic ecosystem, ballast water, invasion, invasive species, invasive species council, pathway, species, task force, and type approval.

Section 4. Consultation and Cooperation

The administering agencies shall enter into a memorandum of agreement regarding implementation of this Act. In carrying out the Act, they shall consult with the Task Force, the Invasive Species Council, the Environmental Protection Agency and other appropriate State and Federal agencies, and shall cooperate with academic researchers.

Section 5. Ecological and Pathway Research

The administering agencies shall conduct surveys of ecosystems and of pathways (such as ships' ballast water) by which invasive species enter U.S. waters in order to track the introduction of invasive species. They shall also conduct experiments to understand the relationship between the conditions under which an invasive species is introduced and the likelihood that it will become established, and maintain a database of all of the information gathered under this section. Ecosystem surveys will review the patterns and rates of invasion at the site, track the establishment of species in ecosystems, monitor the circumstances accompanying that establishment, and document factors that may influence an ecosystem's vulnerability to invasion. Pathway surveys will identify the species being introduced through a given pathway, the quantity being introduced, and handling practices that contribute to the introduction. In carrying out this program the administering agencies will develop standardized protocols for carrying out the surveys and will coordinate their efforts to establish long-term survey sites to collect strong baseline information. A grant program is established to fund academic researchers and state agencies to carry out the surveys at diverse sites distributed geographically around the country.

Section 6. Analysis

The administering agencies shall analyze the survey and experimental results collected under Section 5. Specifically, they will, among other things, identify the highest risk pathways, identify handling practices within pathways that contribute to introductions, and evaluate how much effort is required in reducing introductions for various taxonomic groups to reduce the risk that they will become established. The agencies shall recommend and review pathway management programs to reduce introductions of invasive species. A profile, based on information about species characteristics, ecosystem characteristics and environmental circumstances that favor invasion, will be developed to predict, to the extent practical, whether a species planned for importation is likely to invade a particular ecosystem.

Authorization of Appropriations—To carry out Sections 5 and 6 for FY04 through FY08, the National Oceanic and Atmospheric Administration is authorized $17 million ($13 million of which is for the grant program), the Smithsonian Environmental Research Center is authorized $4 million, and the United States Geological Survey is authorized $4.5 million ($500,000 million of which is to administer the database).

Section 7. Dissemination

The National Invasive Species Council shall disseminate the information developed under Section 6 to relevant audiences. This includes a report to Congress, a mechanism to provide survey findings to support rapid response efforts, and dissemination to users of the various pathways invasive species exploit of information

regarding how their practices should be modified to prevent the introduction of non-native species. The National Invasive Species Council is authorized for FY04 through FY08 $500,000 million per year.

Section 8. Technology Development and Demonstration

The Act establishes and expands several programs to develop technologies to prevent, control and eradicate invasive species. These include (authorizations are for FY04 through FY08):

- The creation of an Environmental Protection Agency grant program to fund research, development, demonstration and verification of a suite of environmentally sound technologies to control and eradicate invasive species. (authorized at $2.5 million per year)
- The creation of an Army Corps of Engineers dispersal barrier research program. (authorized at $1 million per year)
- The expansion of the Ballast Water Technology Demonstration Program to include the demonstration of technologies to treat all ship pathways of introduction (including hull fouling). (authorized at $7.5 million per year)

Section 9. Research to Support the Setting and Implementation of Standards

The Act establishes a research program to support the setting, implementation and evaluation of standards for treatment of ship pathways of introduction. This includes:

- The creation of a Coast Guard and EPA research program to conduct experiments and answer relevant policy questions associated with standards and their implementation, such as the identification of possible circumstances in which a ship may encounter invasive species and in which a treatment technology must be effective. (authorized at $1.5 million for EPA and $1.5 million for Coast Guard for FY04 through FY08)
- Coast Guard research to design a performance test for ballast water exchange. (authorized at $500,000 million for FY04 through FY06)
- A study by the National Academy of Sciences to develop recommendations for a standard. (authorized at $500,000 for FY04)
- An interagency working group to evaluate the effectiveness of the standard and make recommendations for revision.

Section 10. Research in Systematics and Taxonomy

The National Science Foundation shall establish a competitive, peer-reviewed program to award grants to researchers at institutions of higher education and museums to carry out research in systematics and taxonomy. The program is authorized at $2.5 million for FY04 through FY08.

Mr. EHLERS. I ask unanimous consent that the bill be considered as read and open to amendment at any point. Without objection, so ordered.

Hearing no amendments being offered, we will—the question is on the bill, H.R. 1081. I am sorry. Mr. Gutknecht.

Mr. GUTKNECHT. Mr. Chairman, I was considering offering an amendment, because we have had an awful lot of discussion about this between you and I and various committees. And I wonder if we shouldn't offer a line at the very end of the bill that simply says, "And we really mean it," because it really has been difficult for me to see that some of the agencies that are involved in this have not been taking this as seriously as they really need to. And I don't know if it requires more oversight by this committee or other committees, but this is a very serious problem. I agree with you and the Ranking Member. And we have to do all we can. It seems to me—and passing this legislation is an important step. But it seems to me we have to be much more vigilant about this, because some of the answers that I have heard in talking to some of the folks in my state and others is that yes, they take it seriously. But they don't take it as seriously as I believe they should. And

so I am not going to offer that amendment, but I do want to put that out for the record that we do take this seriously. And we hope that the agencies will respond accordingly, and that it is not enough just to control some of these invasive species. We would like to see plans to eliminate them.

Mr. EHLERS. Will the gentleman yield?

Mr. GUTKNECHT. I yield back.

Mr. EHLERS. I am pleased to second your comment, and that is the intent of both of these bills. And the other bill, Mr. Gilcrest's bill, does make it clear there are specific requirements agencies have to meet. But I share your disappointment, particularly with the Coast Guard on the aquatic invasive species. They have had the responsibility for more than a decade now, and very little has transpired. We hope—and we have had meetings with them, and I would be delighted to have oversight meetings to impress on everyone involved that we mean it.

The gentleman's time is expired. Hearing no amendments on the bill, the question is on the bill, H.R. 1081. All those in favor will say "aye." All opposed will say "no." In the opinion of the Chair, the ayes have it. And we will note the presence of a quorum.

I know recognize Mr. Udall for a motion.

Mr. UDALL. Thank you, Mr. Chairman. Mr. Chairman, I would move that the Subcommittee favorably report the bill H.R. 1081 to the full Committee with a recommendation that it be favorably reported to the House. Further, I ask unanimous consent that the staff be instructed to make all necessary technical and conforming changes to the bill in accordance with the recommendations of the Subcommittee.

Mr. EHLERS. The Committee has heard the motion. Those in favor will say "aye." Those opposed will say "no." The ayes have it, and the motion is agreed to. Without objection, the motion to reconsider is laid upon the table.

This concludes our Subcommittee markup, and I am very pleased that we can now move into the hearing portion of this assembly.

[Whereupon, at 10:29 a.m., the Subcommittee proceeded to other business.]

XXI. PROCEEDINGS OF THE FULL COMMITTEE MARKUP ON H.R. 1081, AQUATIC INVASIVE SPECIES RESEARCH ACT

WEDNESDAY, JUNE 4, 2003

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE,
Washington, DC.

The Committee met, pursuant to other business, at 12:05 p.m., in Room 2318 of the Rayburn House Office Building, Hon. Sherwood L. Boehlert (Chairman of the Committee) presiding.

Chairman BOEHLERT. This is a markup on the Invasive Species Research Act of 2003. I ask unanimous consent for the authority to recess the Committee at any point. And without objection, it is so ordered. We will now consider the bill H.R. 1081. I will keep my remarks brief, and I would appreciate others doing the same.

I want to congratulate Dr. Ehlers and all of the other Members of the Committee who worked on this important bill. I know that Chairman Ehlers and his staff have put in well over a year talking to every interested party and refining this bill. Mr. Gilchrest and Mr. Baird have been especially active. The hard work shows, and has resulted in an excellent bipartisan bill.

All of us know the damage that is caused by invasive species, because we see it in our own Districts, and mine is no exception. This bill will, over time, enable us to prevent new invasive species from gaining a tow hold here, although perhaps that is the wrong terminology for aquatic creatures, and will enable us to do a better job of controlling or eradicating the pests that have already made their way to our shores. We will work closely with the other Committees of jurisdiction that have an interest and with the Senate. And I am hopeful that this bill can move either separately or as part of a larger invasive species legislation during this Congress.

[The prepared statement of Chairman Boehlert follows:]

PREPARED STATEMENT OF CHAIRMAN SHERWOOD BOEHLERT

I'll keep my remarks brief as we have worked out all the amendments to this bill, and we should have an expeditious markup.

I just want to congratulate Dr. Ehlers and all the other Members of the Committee who worked on this important bill. I know that Chairman Ehlers and his staff have put in well over a year talking to every interested party and refining this bill. Mr. Gilchrest and Mr. Baird have been especially active. The hard work shows and has resulted in an excellent, bipartisan bill.

All of us know the damage that is caused by invasive species because we see it in our own districts. Mine is no exception. This bill will, over time, enable us to prevent new invasive species from gaining a toehold here—although perhaps that's the

wrong terminology for aquatic creatures—and will enable us to do a better job of controlling or eradicating the pests that have already made their way to our shores.

We will work closely with the other committees of jurisdiction that have an interest in this matter, and with the Senate, and I am hopeful that this bill can move either separately, or as part of larger invasive species legislation, during this Congress.

Chairman BOEHLERT. Mr. Hall.

Mr. HALL. Mr. Chairman, I, too, will be brief, and I thank you. H.R. 1081 is going to help us find a lot of more economical and effective ways to prevent invasive species. And I have a copy of Texas Parks and Wildlife Newsstand with the then Governor George Bush operating a machine that harvested hydrilla, an exotic water plant that chokes a lot of lakes in Texas. It will be some help to that. And this tells me that when we pass this bill that the President will put some wet ink on it quickly.

Thank you.

[The prepared statement of Mr. Hall follows:]

PREPARED STATEMENT OF REPRESENTATIVE RALPH M. HALL

I thank the Chairman for bringing this bill before the Committee today and for working with us on the amendments. H.R. 1081 will help us to find more economical and effective ways to prevent invasive species from being introduced to our lakes, rivers, and coastal areas and to eliminate and control those that are already established.

In Texas, we have serious problems due to aquatic invasive plants such as hydrilla and water hyacinth in our reservoirs, rivers, and lakes. I expect each of us could produce a list of the 10 most unwanted organisms for our home states. I hope through these programs we will provide some help to the state and local agencies struggling to deal with the problems created by invasive species. I urge my colleagues to support the bill.

Chairman BOEHLERT. Thank you very much. I now recognize Dr. Ehlers, the bill's sponsor, and the Chairman of the Environment, Technology, and Standards Subcommittee, for any opening remarks he may have.

Mr. EHLERS. Thank you, Mr. Chairman. And thank you for bringing this timely and important legislation before the Committee, for even as we work on this legislation, invasive species are crossing our borders, invading our lands and waterways, and causing us enormous economic and environmental harm.

I recognize the desire of the Committee and the Chairman to proceed rapidly, so I will summarize my statement and ask that the full statement be entered into the record.

The basic problem this bill addresses is dealing with aquatic invasive species. And one of our biggest problems with that is we simply don't know what to do. The research has to be done first. It has to be done well so that we don't waste money by taking the wrong approach and finding out it doesn't work. So this bill provides arrangements, standards, and funding for conducting research on aquatic invasive species. Particularly, it will involve the U.S. Geological Survey, which has been very active in this. It will involve NOAA, which of course, has a responsibility for it. It will involve the Smithsonian Institution, which has been one of the leaders in studying invasives. And it also will tangentially involve the Coast Guard, which will have the authority to investigate ballast water problems. And finally, it will involve the National Science Foundation in establishing a grant program aimed at sup-

porting the academic research in systematics and taxonomy, which is so badly needed.

So it is a companion piece to the legislation by Mr. Gilchrest, also of this committee. His bill will go through the Resources Committee, first. And this one will join up with it at some point, or may be passed independently simply because the research part of it has to be done first before the other parts can be implemented.

So I thank you, again, Mr. Chairman, for taking it up. And I urge the Committee to give an affirmative vote.

[The prepared statement of Mr. Ehlers follows:]

PREPARED STATEMENT OF REPRESENTATIVE VERNON J. EHLERS

Thank you for yielding, Mr. Chairman, and thank you for bringing this timely and important legislation before the Committee, for even as we work on this legislation, invasive species are crossing our borders, invading our lands and waterways, and causing us enormous economic and environmental harm. Many Members have heard about these invaders from press accounts of the voracious snakehead fish that invaded Maryland waterways last summer, or zebra mussels that have plagued the Great Lakes for over a decade, or specific invasive plants or animals that are affecting their districts. The overwhelming support this legislation has received, with 85 cosponsors, shows that Members and the public understand this growing threat.

I'm pleased to bring this legislation before the Committee because it addresses this threat by providing a comprehensive research program focused on informing and improving the management of aquatic invasive species. For example, when regulatory agencies, in this case the Coast Guard, need to develop standards aimed at preventing invasive species from being introduced by ships, they must ask: What is the risk that invasive species in ballast water—or for that matter, on hulls and other parts of vessels—pose to our environment, and are the management decisions that we have already made working? This legislation sets up a research program to answer these and other difficult management questions. By developing this understanding, we can arrive at better decisions about how to prevent, control and eradicate invasive species.

Now that I've given some sense of the bill's purpose, let me describe it in more detail. The first main component of the bill authorizes a comprehensive ecological and pathway research program, which will enable policy-makers to assess how these species get into our waterways and whether or not management decisions are helping reduce invasions.

The next major piece authorizes the Environmental Protection Agency to begin a development, demonstration and verification program focused on giving Federal, State and local managers more environmentally sound tools to combat invasive species once they arrive.

The next part authorizes a research program to support the Coast Guard's efforts to reduce the threat that ships pose for the introduction of new species into U.S. waters, efforts that will spur the development of technologies to prevent invasive species from entering U. S. waters.

Finally, the last part authorizes the National Science Foundation to establish a grant program aimed at supporting academic research in systematics and taxonomy, so that we will maintain U.S. expertise in these areas and enhance our ability to identify invaders once they arrive.

This legislation complements bills introduced by Mr. Gilchrest in the House and Mr. Levin in the Senate to reauthorize the National Invasive Species Act. Taken together, both my legislation and Mr. Gilchrest's represent an important step forward in our efforts to prevent invasive species from ever crossing our borders and to combat them once they arrive. We simply cannot afford to wait any longer to deal with this problem, and so I urge all of my colleagues to support this legislation.

Chairman BOEHLERT. Thank you very much. And without objection, all Members may place opening statements in the record at this point in time.

[The prepared statement of Mr. Calvert follows:]

PREPARED STATEMENT OF REPRESENTATIVE KEN CALVERT

I appreciate the great efforts, of my dear friend and colleague from Michigan, Mr. Ehlers, to move H.R. 1081 forward. The eradication of non-native invasive species

is extremely important in my district and throughout California. In my state a new pest is introduced every 60 days and, as history has shown, many have become established and destructive to agriculture and native habitats. Non-native invasive species will continue to be introduced as international air transport, tourism, human immigration, and movement of infested agricultural products increase. While H.R. 1081 specifically addresses aquatic invasive species, it serves to highlight all invasive species problems that threaten billions of dollars in agricultural products and jeopardize our water resources. This legislation stresses early detection and coordinated scientific efforts which will have positive results in our communities to combat invasive species in watersheds, rivers, lakes, and coastal areas. I urge my colleagues to support this common sense legislation and with that I want to thank Mr. Ehlers again and thank you Mr. Chairman.

[The prepared statement of Mr. Smith of Michigan follows:]

PREPARED STATEMENT OF REPRESENTATIVE NICK SMITH

I want to thank Chairman Boehlert for holding this hearing today to vote on H.R. 1081, the Aquatic Invasive Species Research Act. I am a co-sponsor of this legislation because I believe that it is critically important for the environment and the economy.

Invasive aquatic species (IAS) inflict billions of dollars worth of damage every year. Foreign to the area that they inhabit, IAS disrupt the ecosystem leading to far reaching and often unexpected consequences. In the State of Michigan, zebra mussels native to Europe infest intake and discharge pipes from facilities that use Great Lakes water, requiring costly maintenance.

My district has been directly affected by a different type of invasive species. The Emerald Ash Borer, native to Asia, was discovered ravishing ash trees in southeast Michigan last summer. So far it has infested about 5.5 million trees and is expected to spread. Whether aquatic or not, these unwanted guests take a considerable toll on society. I feel that it is important that we all continue to work to control and eradicate all forms of harmful invasive species.

This legislation will provide the funding and coordination necessary to allow us to begin fighting IAS comprehensively. For the first time, we will be able to determine the exact routes that IAS take to get here so that new infestations can be prevented. H.R. 1081 will lead to the development of new, environmentally friendly methods for exterminating IAS. It will also establish a research project to come up with standards to eliminate the risk of ships transporting new species into our waters. And finally, a new grant program within the National Science Foundation will be funded to support academic research to make us better able to identify IAS after they arrive. I urge my colleagues to support H.R. 1081.

[The prepared statement of Mr. Costello follows:]

PREPARED STATEMENT OF REPRESENTATIVE JERRY F. COSTELLO

Good morning. Thank you Chairman Boehlert and Chairman Ehlers for working with me to reach a compromise on my amendment to initiate a survey by the U.S. Geological Survey (USGS) in cooperation with the National Oceanic and Atmospheric Administration (NOAA) to gather information about the experience of state and federal agencies in eradicating and controlling invasive species.

I look forward to further collaboration with you as this bill moves closer to consideration by the House. I hope we will be able to develop a provision that will move beyond planning to implementation of a data collection effort by USGS and NOAA.

Resource managers in State and local agencies continue to struggle with an increasing list of invasive species, both aquatic and terrestrial. That is why it is crucial we establish a centralized database to determine what has and has not worked for control and eradication as applied in management setting. In my area, invasive species including Asian Carp and zebra mussels, have been invading our fresh water sources. The invasion of these species has been costly to our boaters and our ecosystems. Our state and local agencies would benefit from a national database that included information about the effectiveness of prevention and control methods as well as cost of each method.

There is more to research than merely documenting the pattern and consequences of invasions. Our states and local areas need to be able to access a wide variety of information, including effectiveness and cost, on a broad range of species.

I want to thank Chairman Ehlers for introducing H.R. 1081 and Chairman Boehlert for working with me on this amendment.

Chairman BOEHLERT. Mr. Baird will have first priority for his statement. He is—has a conflict that requires him to be elsewhere, but we will put him first in line for the statements.

I ask unanimous consent that the bill be considered as open and read to amendment at any point and that the Members proceed with the amendments in the order of the roster.

[See H.R. 1081 in Appendix.]

And the roster lists just three amendments—yeah, three amendments. The first amendment up, Mr. Ehlers, En Bloc.

Mr. EHLERS. Mr. Chairman, I have an amendment at the desk.

Chairman BOEHLERT. The Clerk will read the amendment.

Ms. TESSIERI. Amendment——

Chairman BOEHLERT. Report the amendment.

Ms. TESSIERI. Amendments to H.R. 1081 offered by Mr. Ehlers and Mr. Baird.

[See Amendment in Appendix.]

Chairman BOEHLERT. The gentleman is recognized for five minutes to explain his amendment.

Mr. EHLERS. Thank you, Mr. Chairman. The En Bloc Amendment that Mr. Baird and I are offering makes several primarily technical changes to the bill and clarifies our intent with respect to how the Act would be carried out. Among other things, the amendment would clarify that those involved in managing invasive species at the State level are included in the workshop that we require in this legislation and clarifies that grant money should be used to fund research on aquatic invasive species in both coastal and inland aquatic ecosystems.

The amendment also includes language proposed by Mr. Davis to increase state input into the program, language proposed by Mr. Matheson to recognize the Cooperative Fish and Wildlife Research Program, and language proposed by Mr. Costello to develop a plan to evaluate current control and eradication technologies. This amendment is not controversial. It has been put together by the Minority and the Majority, and I hope that all of my colleagues will support it.

Chairman BOEHLERT. This is the traditional bipartisan Manager's Amendment worked out with Mr.—with Dr. Baird and Dr. Ehlers. And I assume there is no controversy. Is there anyone that feels compelled to speak to these——

Mr. UDALL. Mr. Chairman.

Chairman BOEHLERT. Mr. Udall.

Mr. UDALL. I would move to strike the last word.

Chairman BOEHLERT. The gentleman is recognized.

Mr. UDALL. I want to just speak on behalf of our colleague, Congressman Baird; he has been, unfortunately, detained, as you mentioned. And so that we don't hold up the proceedings, he asked me to express his gratitude and the gratitude of the Committee to Chairman Ehlers for working with us on the bill and to you, Mr. Boehlert—Mr. Chairman, as well.

So I would ask unanimous consent that Representative Baird's statement would be placed in the record, and I would urge my colleagues to support the amendment and the underlying bill.

[The prepared statement of Mr. Baird follows:]

PREPARED STATEMENT OF REPRESENTATIVE BRIAN BAIRD

I want to thank Chairman Boehlert for moving this bill forward today. I also want to thank Subcommittee Chairman Ehlers for working with me on this Manager's amendment.

Invasive species are now found throughout the country, and they are causing extensive ecological and economic damage. States and local resource management agencies are struggling with problems created by invasive species—everything from degradation of habitat for ecologically and commercially important native species to clogging of waterways and water infrastructure. The list of damaging species is long and it is growing rapidly. Assuming we can provide the additional resources authorized in this bill, we will gather the information we need to prevent introduction of, and to respond quickly to eradicate and control invasive species. Prevention and quick response will enable us to save millions of dollars and to maintain the productivity of our land and water resources.

This bill will now proceed to the Resources, Transportation, and House Administration Committees. I welcome the opportunity to continue working with Chairman Boehlert and Chairman Ehlers over in the Transportation Committee to further improve this bill and the companion bill on invasive species management. I urge all my colleagues to support this amendment and the underlying bill.

Chairman BOEHLERT. Thank you very much, and I do—the Chair does acknowledge the outstanding contribution that Dr. Baird has made to this Subcommittee and the Full Committee. And we miss him, but we know there are conflicts, and we all have conflicts.

Is there anyone else who feels—yes, sir, Mr. Davis.

Mr. DAVIS. I move to strike the last word.

Chairman BOEHLERT. The gentleman is recognized.

Mr. DAVIS. Mr. Chairman, I, too, would like to thank the Chairman for allowing the particular amendment that I have offered to be allowed to be in the Manager's Amendment. And I would like unanimous consent to include a statement.

Chairman BOEHLERT. Without objection, so ordered.

[The prepared statement of Mr. Davis follows:]

PREPARED STATEMENT OF REPRESENTATIVE LINCOLN DAVIS

Thank you, Mr. Chairman. I want to commend, Chairman Ehlers for his work on this legislation. Invasive species cost the United States billions of dollars every year. We need to work smarter to control invasive species and H.R. 1081 is a step in the right direction.

As we all know, states and localities bear the brunt of controlling and eradicating invasive species. H.R. 1081 develops a number of protocols to help states identify invasive species, before they become a problem. I was concerned there wasn't a good tie between what the research community would develop and the actual users of their activities. My amendment would ensure that there is coordination between the federal agencies implementing this legislation and state officials. At a hearing before the Subcommittee on Harmful Algal Bloom, one state manager said that researchers pursue a path of enquiry or develop a plan that doesn't really suit the needs of state officials. In this time of scarce budget resources, I wanted to ensure that research agendas and protocols will yield results and data that can be used by State and local officials.

This is not a major change to the legislation, it simply strengthens existing language in Sec. 4 of the bill.

I want to thank Chairman Boehlert and Chairman Ehlers for working with me on this amendment. And I would urge everyone to support this amendment.

Chairman BOEHLERT. If there is no further discussion, Mr. Boehlert——

Mr. MATHESON. Mr. Chairman, could I just——

Chairman BOEHLERT. Who seeks recognition?

Mr. MATHESON. Mr. Chairman, just—I have a statement I would like to submit for the record. And I just want to thank you and

your staff for being very helpful in incorporating some language in the Manager's Amendment.

Chairman BOEHLERT. Thank you very much. And without objection, so ordered.

[The prepared statement of Mr. Matheson follows:]

PREPARED STATEMENT OF REPRESENTATIVE JIM MATHESON

I move to strike the last word.

Mr. Chairman, I want to thank you and the Chairman of the Environment, Technology and Standards Subcommittee for including my amendment in the Manager's amendment. As you know, drought continues to be a great problem in the West. Tamarisk and other invasive riparian species overwhelmingly contribute to this ongoing problem. Tamarisk is helping to reshape the large river ecosystems throughout the Colorado River System. This plant changes river hydrology and geomorphology, affecting habitats for organisms living in the river. The Green and Colorado Rivers in Utah are particularly vulnerable to additional disruption of ecosystem functions. Tamarisk occupies more than a million acres of riparian habitat in the West. Tamarisk consumes as much water as California's allotment of the Colorado River. A single plant can absorb up to 300 gallons of water a day through taproots that reach deep into the water table. The West is losing from 2.0 to 4.5 million acre-feet of water per year over what native plants would use. This is enough water to supply over 20 million people or to irrigate over one million acres of land. For example, Spring Lake in New Mexico was overrun by Tamarisk; eventually it occupied the entire shoreline causing a lake that was 40 to 45 feet deep to dry up. This lake was vital for Texas water users. Something similar is bound to happen along the Green and Colorado Rivers unless something is done. Research is needed to both understand the reasons why this species is so dominant and to control and reverse these invasions. Thank you Mr. Chairman.

Chairman BOEHLERT. If there are no further discussion, the vote occurs on the amendments. All in favor, say aye. Opposed, nay. The ayes have it. And the amendment is agreed to.

The next amendment, amendment number two, is offered by Mr. Hall on behalf of Ms. Jackson Lee. And I will let Mr. Hall know that the Chair will recommend this as a good amendment and is prepared to accept it.

Mr. Hall.

Mr. HALL. I won't ruin my chances of passage by explaining it. I yield back my time.

Chairman BOEHLERT. Everyone has a copy of the amendment before——

Mr. HALL. I ask unanimous consent to put Mrs. Jackson Lee's statement in the record.

Chairman BOEHLERT. Without objection, so ordered.

[The prepared statement of Ms. Lee follows:]

PREPARED STATEMENT OF REPRESENTATIVE SHEILA JACKSON LEE

Mr. Chairman,

This is a good bill, and I commend you and Ranking Member Hall for your hard work. This bill will definitely bring protection to our nation's waterways, like in Galveston Bay and the Port of Houston. This amendment simply makes sure that we get the most we can out of our federal research investment, by ensuring that the Act harnesses the power of the diverse pool of excellent colleges and universities in the United States.

All of our major colleges and universities have dual purposes—producing data—and producing the intellectual leaders of tomorrow. As written, this Act will enable our nation's research facilities to produce scientific data which will guide better policy and procedures and products, that will make our waterways cleaner, clearer for traffic, and more hospitable to the fish and wildlife that are supposed to be there. As an added benefit, much of that research will be done by graduate students and

post-doctoral fellows, who will then become the leaders in oceanographic and biological research in the future.

My amendment also has a dual purpose. In the section of the bill establishing the competitive grant program, it adds that the program will include Historically Black Colleges and Universities, those serving large proportions of Hispanics, Native Americans, Asian-Pacific Americans, and other populations under-represented in the sciences. It will ensure that the research programs we create take advantage of the excellent expertise and experience of these institutions. This will make the science better. Furthermore, it will make it more likely that the future leaders in this exciting field reflect the diversity of this great nation, so that all Americans can benefit from the way we spend their tax dollars.

This amendment will make sure that these great institutions and the young people in them, are included and not excluded from the program we establish here. Mr. Chairman, I understand that my staff has been working with yours on this amendment. I hope you and my colleagues will support it.

Thank you.

[See Amendment in Appendix.]

Chairman BOEHLERT. Dr. Ehlers.

Mr. EHLERS. Thank you, Mr. Chairman. I support the amendment offered by Ms. Jackson Lee, and I urge its adoption.

Chairman BOEHLERT. Thank you very much. If there is no further discussion, the vote is on the amendment. All in favor, say aye. Nays. The ayes have it. The amendment is agreed to.

The third and final amendment on our list is an amendment offered by our distinguished colleague, Mr. Wu, who is recognized for—first of all, the Clerk will report the amendment.

Ms. TESSIERI. Amendment to H.R. 1081 offered by Mr. Wu.

[See Amendment in Appendix.]

Chairman BOEHLERT. Mr. Wu is recognized for the traditional 30 seconds.

Mr. WU. Thank you, Mr. Chairman.

Mr. Chairman, we have invasive species in the Pacific Northwest ranging from fish to mussels to plants. And there is, appropriately, a lot of focus on the Great Lakes and other bodies of water where there are larger populations and people who are concerned about these things. We have a relatively benign environment where a lot of invasive species can thrive and lower population and so we don't kick up as much of a ruckus as sometimes we could or should. We do have a problem with certain invasive aquatic plant species.

I understand from staff discussion that the particular centers, which this amendment is aimed at encouraging work on aquatic species, invasive aquatic species, that these particular centers are under the jurisdiction of the Army Corps of Engineers. And unless the Chairman would like to take a poke at slightly expanding the jurisdiction of this committee, I would certainly—I offer this amendment and would like to work with the Chairman and the rest of the Committee in finding a place in report language and then in statutory language, perhaps, in an appropriate bill, in an appropriate vehicle to effectively address these invasive aquatic species and problems that we have in the Columbia River and the Pacific Northwest.

[The prepared statement of Mr. Wu follows:]

PREPARED STATEMENT OF REPRESENTATIVE DAVID WU

- Millions of acres of inland waterways are choked with non-native aquatic plants. With no natural enemies, these invasive species choke native aquatic plants, serve no value to fish and wildlife, and contribute to water quality

problems. Some of these plants also interfere with navigation, flood control, hydropower production, and waterborne recreational uses.

- I support the intent of H.R. 1081, the Aquatic Invasive Species Research Act, and applaud the sponsor of this piece of legislation, Mr. Ehlers, for H.R. 1081. While I understand that the Army Corps of Engineers is not within the Science Committee's jurisdiction, the Corps' Aquatic Plant Control Research Program (APCRP) does have the capacity and the expertise to deal with this issue. The APCRP is the Nation's only federally research program directed to develop technology for the management of non-indigenous aquatic plant species.
- I believe my amendment would help solve the aquatic invasive plants problem by providing funding and directing the Corps to work with those regional expertise to control and eradicate invasive aquatic plants. I ask my colleagues to work with me to address this important issue.
- I understand that staff had discussions last night about report language[1] to address the invasive aquatic plants issue. I appreciate the Chairman's willingness to work with me on this issue.

Chairman BOEHLERT. We compliment the gentleman. Our staffs have worked well together, and it is my understanding you are prepared to withdraw the amendment with the understanding that we have—we will work out agreeable language for the Committee Report and will continue to work together.

The difference between Oregon and New York just hit me like a ton of bricks as you were speaking. In Oregon, you raise a ruckus. In New York, we raise hell, but we end up accomplishing a great deal by working on a bi-coastal basis. And so is it—my understanding correct that you have agreed to withdraw the amendment, we—understanding that we have report language that will deal on a very responsible way with the subject matter?

Mr. WU. Mr. Chairman, I just want to point out that there is an Astoria, New York, and there is an Astoria, Oregon in my Congressional District. We have a lot in common. Ruckus and otherwise notwithstanding, I ask unanimous consent to withdraw the amendment.

Chairman BOEHLERT. Without objection, so ordered. We look forward to continued working and productive partnership.

Mr. EHLERS. Mr. Chairman.

Chairman BOEHLERT. Who seeks recognition? Dr. Ehlers.

Mr. EHLERS. Thank you. I just wanted to have my comments. I think Mr. Wu has—is in the right direction in offering this amendment. I disagree with one of his comments in which he said he didn't make enough of a ruckus. I find that he makes plenty of ruckuses. Fortunately, they are constructive ruckuses.

I would also point out that whereas you may do similar things in New York, it is the Midwest that quietly goes around solving all of the problems. And so——

Chairman BOEHLERT. The gentleman's time has expired.

Mr. EHLERS. But I just wanted to say I agree with the action taken. The amendment would not be appropriate, because it would lead to tremendous jurisdictional problems in the future. But I

[1] The Committee recognizes the significant problems experienced in many of the Nation's rivers, streams, and lakes due to invasive aquatic plants. The Committee intends to have the interagency programs authorized in this bill address the problems of aquatic invasive plants by drawing upon the expertise and experience of Federal programs, and their State and local cooperating organizations. The program should be national in scope and strive for balanced coverage of the problems of aquatic invasive species that impact all waters of the United States.

think it is a good idea, and let us put it in the report language and talk about ways we can bring it into effect.

Chairman BOEHLERT. Thank you very much. If there are no further amendments—pardon me. It has already had unanimous consent. That is withdrawn. No further amendments. So I move that—let us see. Now I will recognize distinguished Ranking Member.

Mr. HALL. Mr. Chairman, I move that the Committee favorably report H.R. 1081, as amended, to the House with the recommendation that the bill, as amended, do pass. Furthermore, I move that the staff be instructed to prepare the legislative report and make necessary technical and conforming changes and that the Chairman take all of the necessary steps to bring the bill before the House for consideration.

Chairman BOEHLERT. That is great. And we will hold that in reserve, because the—we have got to actually pass the bill. And so H.R. 1081, the Aquatic Invasive Species Research Act, as amended. The question is on passage. All in favor, say aye. Opposed, no. The ayes have it, and the bill is passed.

And Mr. Hall has already given his statement, which——

Mr. HALL. I will read it again, if you——

Chairman BOEHLERT. No, you don't need to. We will properly insert it at the correct spot in the record.

The Chair notes the presence of a quorum. The question is on the motion to report the bill favorably. Those in favor of the motion will signify by saying aye. Opposed, no. The ayes have it. And the bill is favorably reported. Without objection, the motion to reconsider is laid upon the table. I move that Members have two subsequent calendar days in which to submit supplemental Minority or additional views on the measure. I move pursuant to Clause 1 of Rule 22 of the House of Representatives that the Committee authorize the Chairman to offer such motions, as may be necessary in the House, to go to conference with the Senate on the bill H.R. 1081, or a similar Senate bill. Without objection, so ordered.

This concludes our Committee markup, and I thank my colleagues for their cooperation.

Mr. Costello.

Mr. COSTELLO. Mr. Chairman, I apologize. We were in a Transportation Committee—Subcommittee hearing. I wanted to enter into a colloquy with you. I would ask that I submit this for the record. I think that we have an understanding on Section 11 where you have accepted some of the language, but we are to work out the rest before the bill goes to the Floor. Without going through the entire colloquy, I would ask, is that your understanding?

Chairman BOEHLERT. That is my understanding. I will be happy to work with the gentleman, and we will have the colleague, which we will submit, without objection, for the record.

[The prepared statement of Mr. Costello follows:]

STATEMENT FOR THE RECORD BY REPRESENTATIVE JERRY F. COSTELLO

Section 11 which is added by the amendment before us is an important addition, but less ambitious than the language I originally proposed for inclusion in this legislation. I commend my colleagues for their willingness to have the administering agencies, in cooperation with appropriate state agencies, develop a plan to survey current methods used by the Federal and State governments to control and eradicate aquatic invasive species, facilitate exchange of information on best practices,

and evaluate the cost-effectiveness of the various approaches to control of invasive species. While the amendment also requires the plan to be submitted to the Congress, in its current form, it does not require implementation. The last thing we need is to receive yet another plan from the Executive Branch that sits on the shelf and gathers dust. It is my hope that we can refine this amendment to the point where it once again becomes a full-fledged program. I agreed to the current formulation after receiving the Chairman's assurances that there was time to improve this provision as this bill moves through the legislative process. Is this the Chairman's understanding?

Chairman BOEHLERT. I will be happy to work with the gentleman. I am as committed as you are to solving this problem, but I just did not feel that we had enough information at this point to understand how this Section 11 relates to ongoing state activities and what the costs of such a program would be. You are correct that we have some time before this bill reaches the Floor and I am happy to work with the gentleman over the coming weeks to understand the implications of his original proposal and to see if we can design an implementation provision to complement the very important step we are taking here today.

Mr. COSTELLO. I would ask that instead of having the colloquy now that I be able to submit it for the record and we can work to work this out.

Chairman BOEHLERT. Thank you very much, and without objection, so ordered. And with that, let me state that the Committee now concludes its business. Thank you all very much.

[Whereupon, at 12:20 p.m., the Committee was adjourned.]

Appendix

Roster, Amendments, H.R. 1081, Section-By-Section Analysis, and Summary

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COMMITTEE ON SCIENCE
FULL COMMITTEE MARKUP - June 4, 2003
AMENDMENT ROSTER

H.R. 1081, Aquatic Invasive Species Research Act
--Motion to adopt the bill, as amended: agreed to by a voice vote.
--Motion to report the bill, as amended: agreed to by a voice vote.

No.	Sponsor	Description	Result
1.	Mr. Ehlers Mr. Baird	En Bloc Amendment – includes a number of technical changes, enhances state input into the program, and authorizes the development of a plan to evaluate eradication and control technologies.	--Adopted by a voice vote.
2.	Ms. Jackson Lee	Amendment provides clarifying language to Section 5(e) - Competitive Grant Program. This language recognizes that institutions attended by underrepresented groups should be included in the grant program to the maximum extent practicable.	--Offered by Mr. Hall, at the request of Ms. Jackson Lee, the amendment was adopted by a voice vote.
3.	Mr. Wu	Amendment inserts a new subsection titled Section 5(j) – Control and Eradication Research Program. This amendment would create a new research program at a Corps of Engineers Center to conduct research on aquatic plants, and is authorized at $10 million per year.	--Withdraw.

AMENDMENTS TO H.R. 1081

OFFERED BY MR. EHLERS AND MR. BAIRD

Page 4, lines 16 and 17, amend subparagraph (B) to read as follows:

1 (B) the Smithsonian Institution (acting
2 through the Smithsonian Environmental Re-
3 search Center); and

Page 4, line 21, insert ", riparian areas," after "inland waters".

Page 6, lines 8 through 21, amend section 4 to read as follows:

4 **SEC. 4. COORDINATION AND IMPLEMENTATION.**
5 (a) COORDINATION.—In carrying out this Act, the
6 administering agencies shall coordinate with—
7 (1) appropriate State agencies;
8 (2) the Fish and Wildlife Service, the Environ-
9 mental Protection Agency, and other appropriate
10 Federal agencies; and
11 (3) the Task Force and Invasive Species Coun-
12 cil.
13 (b) IMPLEMENTATION.—The administering agencies
14 shall enter into a memorandum of understanding regard-
15 ing the implementation of this Act, which shall include the
16 coordination required by subsection (a).

1 (c) COOPERATION.—In carrying out this Act, the ad-
2 ministering agencies shall contract, as appropriate, or oth-
3 erwise cooperate with academic researchers.
4 (d) STRUCTURE.—To the extent practicable, the ad-
5 ministering agencies shall carry out this Act working with-
6 in the organizational structure of the Task Force and
7 Invasive Species Council.

Page 7, line 17, insert "under subsection (a)" after "aquatic species".

Page 7, lines 18 through 24, strike ", and shall recommend" and all that follows through "under subsection (a)".

Page 8, lines 1 through 4, strike "Upon the development" and all that follows through "and local entities.".

Page 9, lines 2 and 3, strike "population" and insert "abundance".

Page 10, lines 3 through 5, strike "administering agencies (acting through the National Oceanic and Atmospheric Administration) shall" and insert "National Oceanic and Atmospheric Administration and the United States Geological Survey shall jointly".

Page 10, line 6, insert "competitive, peer-reviewed" after "program to award".

Page 10, lines 8 and 9, strike "subsections (b) and (h)" and all that follows through "and merit-based" and insert "subsection (a)".

Page 10, line 19, insert "and to determine how to obtain consistent, comparable data across a range of ecosystems," after "subsections (b) and (c),".

Page 10, line 20, strike "convene a" and insert "convene at least one".

Page 10, line 20, insert "and representatives involved in the management of aquatic invasive species" after "appropriate researchers".

Page 10, line 24, strike "120 days" and insert "180 days".

Page 11, lines 2 through 4, strike "shall conduct" through "taxonomic groups" and insert "shall conduct research".

Page 11, line 7, strike "survive and thrive" and insert "become invasive".

Page 11, lines 12 and 13, strike "Smithsonian Environmental Research Center" and insert "Smithsonian Institution (acting through the Smithsonian Environmental Research Center)".

Page 11, line 21, insert ", both domestic and foreign," after "existing databases".

Page 14, line 16, strike "reducing" and insert "preventing nonnative".

Page 15, lines 19 through 22, amend paragraph (2) to read as follows:

1 (2) $11,000,000 for the United States Geologi-
2 cal Survey (including activities through the Coopera-
3 tive Fish and Wildlife Research Program), of which
4 $6,500,000 shall be for the grant program under
5 section 5(e), and of which $500,000 shall be for de-
6 veloping, maintaining, and updating the database
7 under section 5(i); and

Page 15, line 23, strike "$17,000,000" and insert "$10,500,000".

Page 15, line 24, strike "$13,000,000" and insert "$6,500,000".

Page 16, lines 5 and 6, strike "Federal, State, and local entities, including" and insert "the public, including Federal, State, and local entities,".

Page 16, line 21, strike "harmful nonnative" and insert "invasive".

Page 17, line 6, insert "to the Secretary of the Interior" after "to be appropriated".

Page 17, lines 17 and 18, strike "and the administering agencies" and insert ", the administering agencies, and the Task Force".

Page 18, line 23, strike ", merit-based".

Page 27, after line 10, insert the following new section:

1 **SEC. 11. STATE PROGRAMS.**

2 (a) PLAN.—The administering agencies, in coopera-
3 tion with the appropriate State agencies, shall develop a
4 plan to—

5 (1) conduct a survey of methods States and
6 Federal agencies are using to control or eradicate
7 aquatic invasive species;

8 (2) facilitate the exchange of information
9 among States and Federal agencies on methods
10 States or Federal agencies have found to be effective
11 at controlling or eradicating aquatic invasive species
12 and the costs of those methods; and

13 (3) evaluate the cost-effectiveness of the various
14 methods States and Federal agencies are using to
15 control or eradicate aquatic invasive species.

1 (b) REPORT.—Not later than one year after the date
2 of enactment of this Act, the administering agencies shall
3 jointly transmit to the Congress the plan described in sub-
4 section (a) and the expected costs of carrying out the plan.

AMENDMENT TO H.R. 1081
OFFERED BY MS. JACKSON-LEE OF TEXAS

Page 10, line 9, insert ", and shall include to the maximum extent practicable diverse institutions, including Historically Black Colleges and Universities and those serving large proportions of Hispanics, Native Americans, Asian-Pacific Americans, or other underrepresented populations" after "and merit-based".

AMENDMENT TO H.R. 1081

OFFERED BY MR. WU

Page 12, after line 2, insert the following new subsection:

1 (j) CONTROL AND ERADICATION RESEARCH PRO-
2 GRAM.—The Corps of Engineers Center for Aquatic Plant
3 Research and Technology shall work with institutions with
4 expertise with aquatic plant management to conduct re-
5 search, development, and demonstration to control, pre-
6 vent, and eradicate invasive aquatic plants. There are au-
7 thorized to be appropriated to the Corps of Engineers
8 $10,000,000 for carrying out this subsection.

108TH CONGRESS
1ST SESSION

H. R. 1081

To establish marine and freshwater research, development, and demonstration programs to support efforts to prevent, control, and eradicate invasive species, as well as to educate citizens and stakeholders and restore ecosystems.

IN THE HOUSE OF REPRESENTATIVES

MARCH 5, 2003

Mr. EHLERS (for himself, Mr. GILCHREST, Mr. BAIRD, Mr. HOEKSTRA, Mr. ORTIZ, Mrs. BIGGERT, Mr. KIRK, Mr. KILDEE, Mr. CAMP, Mr. MCHUGH, Mr. EMANUEL, Ms. SLAUGHTER, Mr. ROGERS of Michigan, Mr. ENGLISH, Mr. FARR, Mr. CUMMINGS, Mr. LEVIN, Mr. STUPAK, Mr. SCOTT of Virginia, Mr. ABERCROMBIE, Mr. QUINN, Mr. SMITH of Washington, Mr. GEORGE MILLER of California, Mrs. MALONEY, Mr. DINGELL, Ms. KAPTUR, Ms. LEE, Mr. SAXTON, Mr. DICKS, Ms. BORDALLO, Mr. VISCLOSKY, Mr. WALSH, Mr. UPTON, Mr. GILLMOR, Mr. SMITH of Michigan, Mr. CASE, Mr. BOEHLERT, Mr. BROWN of Ohio, Mr. GREENWOOD, Mr. PALLONE, Mr. MARKEY, Mr. DELAHUNT, Mr. CARDIN, Mr. ALLEN, Mrs. MILLER of Michigan, Mr. BLUMENAUER, Mr. INSLEE, Mr. HOUGHTON, Ms. MCCOLLUM, Mr. MCGOVERN, Mr. MCCOTTER, Ms. BALDWIN, Mr. LEACH, Mr. MCDERMOTT, Mr. NEAL of Massachusetts, Mr. KNOLLENBERG, Mr. TOWNS, Mr. HONDA, Mr. LIPINSKI, Mr. WEINER, Mr. KIND, Mr. EVANS, Ms. LOFGREN, Mr. JOHNSON of Illinois, Mr. KLECZKA, Mr. SIMMONS, Mr. FALEOMAVAEGA, and Mr. LATOURETTE) introduced the following bill; which was referred to the Committee on Science, and in addition to the Committees on Transportation and Infrastructure, Resources, and House Administration, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned

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A BILL

To establish marine and freshwater research, development, and demonstration programs to support efforts to prevent, control, and eradicate invasive species, as well as to educate citizens and stakeholders and restore ecosystems.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Aquatic Invasive Species Research Act".

SEC. 2. FINDINGS.

The Congress makes the following findings:

(1) Aquatic invasive species damage infrastructure, disrupt commerce, outcompete native species, reduce biodiversity, and threaten human health.

(2) The direct and indirect costs of aquatic invasive species to our Nation's economy number in the billions of dollars per year. In the Great Lakes region, approximately $3,000,000,000 dollars have been spent in the past 10 years to mitigate the damage caused by one invasive species, the zebra mussel.

(3) Recent studies have shown that, in addition to economic damage, invasive species cause enormous environmental damage, and have cited invasive species as the second leading threat to endangered species.

(4) Over the past 200 years, the rate of detected marine and freshwater invasions in North America has increased exponentially.

(5) The rate of invasions continues to grow each year.

(6) Marine and freshwater research underlies every aspect of detecting, preventing, controlling, and eradicating invasive species, educating citizens and stakeholders, and restoring ecosystems.

(7) Current Federal efforts, including research efforts, have focused primarily on controlling established invasive species, which is both costly and often unsuccessful. An emphasis on research, development, and demonstration to support efforts to prevent invasive species or eradicate them upon entry into United States waters would likely result in a more cost-effective and successful approach to combating invasive species through preventing initial introduction.

(8) Research, development, and demonstration to support prevention and eradication includes monitoring of both pathways and ecosystems to track the introduction and establishment of non-native species, and development and testing of technologies to prevent introduction through known pathways.

(9) Therefore, Congress finds that it is in the United States interest to conduct a comprehensive and thorough research, development, and demonstration program on aquatic invasive species in order to better understand how aquatic invasive species are introduced and become established and to support efforts to prevent the introduction and establishment of, and to eradicate, these species.

SEC. 3. DEFINITIONS.

In this Act:

(1) ADMINISTERING AGENCIES.—The term "administering agencies" means——

(A) the National Oceanic and Atmospheric Administration (including the Great Lakes Environmental Research Laboratory);

(B) the Smithsonian Environmental Research Center; and

(C) the United States Geological Survey.

(2) AQUATIC ECOSYSTEM.—The term "aquatic ecosystem" means a fresh-water, marine, or estuarine environment (including inland waters and wetlands) located in the United States.

(3) BALLAST WATER.—The term "ballast water" means any water (with its suspended matter) used to maintain the trim and stability of a vessel.

(4) INVASION.—The term "invasion" means the introduction and establishment of an invasive species into an ecosystem beyond its historic range.

(5) INVASIVE SPECIES.—The term "invasive species" means a species——

(A) that is non-native to the ecosystem under consideration; and

(B) whose introduction causes or may cause harm to the economy, the environment, or human health.

(6) INVASIVE SPECIES COUNCIL.—The term "Invasive Species Council" means the council established by section 3 of Executive Order No. 13112 (42 U.S.C. 4321 note).

(7) PATHWAY.—The term "pathway" means 1 or more routes by which an invasive species is transferred from one ecosystem to another.

(8) SPECIES.—The term "species" means any fundamental category of taxonomic classification or any viable biological material ranking below a genus or subgenus.

(9) TASK FORCE.—The term "Task Force" means the Aquatic Nuisance Species Task Force established by section 1201(a) of the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (16 U.S.C. 4721(a)).

(10) TYPE APPROVAL.—The term "type approval" means an approval procedure under which a type of system is certified as meeting a standard established pursuant to Federal law for a particular application.

SEC. 4. CONSULTATION AND COOPERATION.

(a) MEMORANDUM OF UNDERSTANDING.—The administering agencies shall enter into a memorandum of understanding regarding implementation of this Act.

(b) CONSULTATION.—In carrying out this Act, the administering agencies shall consult with——

(1) the Task Force and Invasive Species Council;

(2) the Environmental Protection Agency; and

(3) other appropriate Federal and State agencies.

(c) COOPERATION.—In carrying out this Act, the administering agencies shall contract, as appropriate, or otherwise cooperate with academic researchers.

SEC. 5. ECOLOGICAL AND PATHWAY RESEARCH.

(a) IN GENERAL.—The administering agencies shall develop and conduct a marine and fresh-water research program which shall include ecological and pathway surveys and experimentation to detect non-native aquatic species in aquatic ecosystems and to assess rates and patterns of introductions of non-native aquatic species in aquatic ecosystems. The goal of this marine and freshwater research program shall be to support efforts to prevent the introduction of, detect, and eradicate invasive species through informing early detection and rapid response efforts, informing relevant policy decisions, and assessing the effectiveness of implemented policies to prevent the introduction and spread of aquatic invasive species. Surveys and experiments under this subsection shall be commenced not later than 18 months after the date of the enactment of this Act.

(b) PROTOCOL DEVELOPMENT.—The administering agencies shall establish standardized protocols for conducting ecological and pathway surveys of non-native aquatic species that are integrated and produce comparable data, and shall recommend a standardized approach for classifying species. For ecological surveys, two protocols shall be developed, one to support early detection surveys that may be conducted by Federal, State, or local agencies involved in the management of invasive species, and a second protocol to support the surveys conducted under subsection (a). Protocols shall, as practicable, be integrated with existing protocols and data collection methods. Upon the development of protocols to support early detection surveys, the Task Force shall make appropriate efforts to disseminate the protocols to appropriate Federal, State, and local entities. In developing the protocols under this subsection, the administering agencies shall draw on the recommendations gathered at the workshop under subsection (g). The protocols shall be peer reviewed, and revised as necessary. Protocols shall be completed within 1 year after the date of the enactment of this Act.

(c) ECOLOGICAL AND PATHWAY SURVEY REQUIREMENTS.—(1) Each ecological survey conducted under subsection (a) shall, at a minimum——

(A) document baseline ecological information of the aquatic ecosystem including, to the extent practicable, a comprehensive inventory of native species, non-native species, and species of unknown origin present in the ecosystem, as well as the chemical and physical characteristics of the water and underlying substrate;

(B) for non-native species, gather information to assist in identifying their life history, environmental requirements and tolerances, the historic range of their native ecosystems, and their history of spreading from their native ecosystems;

(C) track the establishment of non-native species including information about the estimated population of non-native organisms in order to allow an analysis of the probable date of introduction of the species; and

(D) identify the likely pathway of entry of non-native species.

(2) Each pathway survey conducted under this section shall, at a minimum——

(A) identify what non-native aquatic species are being introduced or may be introduced through the pathways under consideration;

(B) determine the quantities of organisms being introduced through the pathways under consideration; and

(C) determine the practices that contributed to or could contribute to the introduction of non-native aquatic species through the pathway under consideration.

(d) NUMBER AND LOCATION OF SURVEY SITES.—The administering agencies shall designate the number and location of survey sites necessary to carry out marine and freshwater research required under this section. In establishing sites under this subsection or subsection (e), emphasis shall be on the geographic diversity of sites, as well as the diversity of the human uses and biological characteristics of sites.

(e) COMPETITIVE GRANT PROGRAM.—The administering agencies (acting through the National Oceanic and Atmospheric Administration) shall administer a program to award grants to academic institutions, State agencies, and other appropriate groups, in order to assist in carrying out subsections (b) and (h). This program shall be competitive, peer-reviewed, and merit-based.

(f) SHIP PATHWAY SURVEYS.—Section 1102(b)(2)(B)(ii) of the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (16 U.S.C. 4712(b)(2)(B)(ii)) is amended to read as follows:

"(ii) examine other potential modes for the introduction of non-native aquatic species by ship, including hull fouling.".

(g) WORKSHOP.—In order to support the development of the protocols and design for the surveys under subsections (b) and (c), the administering agencies shall convene a workshop with appropriate researchers from Federal and State agencies and academic institutions to gather recommendations. The administering agencies shall make the results of the workshop widely available to the public. The workshop shall be held within 120 days after the date of the enactment of this Act.

(h) EXPERIMENTATION.—The administering agencies shall conduct laboratory and field-based marine and freshwater research experiments on a range of taxonomic groups to identify the relationship between the introduction and establishment of non-native aquatic species, including those legally introduced, and the circumstances necessary for those species to survive and thrive.

(i) NATIONAL PATHWAY AND ECOLOGICAL SURVEYS DATABASE.——

(1) IN GENERAL.—The United States Geological Survey shall develop, maintain, and update, in consultation and cooperation with the Smithsonian Environmental Research Center, the National Oceanic and Atmospheric Administra-

tion, and the Task Force, a central, national database of information concerning information collected under this section.

(2) REQUIREMENTS.—The database shall——

(A) be widely available to the public;

(B) be updated not less than once a quarter;

(C) be coordinated with existing databases collecting similar information; and

(D) be, to the maximum extent practicable, formatted such that the data is useful for both researchers and Federal and State employees managing relevant invasive species programs.

SEC. 6. ANALYSIS.

(a) INVASION ANALYSIS.——

(1) IN GENERAL.—Not later than 3 years after the date of the enactment of this Act, and every year thereafter, the administering agencies shall analyze data collected under section 5 and other relevant research on the rates and patterns of invasions by aquatic invasive species in waters of the United States. The purpose of this analysis shall be to use the data collected under section 5 and other relevant research to support efforts to prevent the introduction of, detect, and eradicate invasive species through informing early detection and rapid response efforts, informing relevant policy decisions, and assessing the effectiveness of implemented policies to prevent the introduction and spread of invasive species.

(2) CONTENTS.—The analysis required under paragraph (1) shall include with respect to aquatic invasive species——

(A) an analysis of pathways, including——

(i) identifying, and characterizing as high, medium, or low risk, pathways regionally and nationally;

(ii) identifying new and expanding pathways;

(iii) identifying handling practices that contribute to the introduction of species in pathways; and

(iv) assessing the risk that species legally introduced into the United States pose for introduction into aquatic ecosystems;

(B) patterns and rates of invasion and susceptibility to invasion of various bodies of water;

(C) how the risk of establishment through a pathway is related to the identity and number of organisms transported;

(D) rates of spread and numbers and types of pathways of spread of new populations of the aquatic invasive species and an estimation of the potential spread and distribution of newly introduced invasive species based on their environmental requirements and historical distribution;

(E) documentation of factors that influence an ecosystem's vulnerability to a non-native aquatic species becoming invasive;

(F) a description of the potential for, and impacts of, pathway management programs on invasion rates;

(G) recommendations for improvements in the effectiveness of pathway management;

(H) to the extent practical, a determination of the level of reduction in live organisms of various taxonomic groups required to reduce the risk of establishment to receiving aquatic ecosystems to an acceptable level; and

(I) an evaluation of the effectiveness of management actions (including any standard) at reducing species introductions and establishment.

(c) RESEARCH TO ASSESS THE POTENTIAL OF THE ESTABLISHMENT OF INTRODUCED SPECIES.—Within 2 years after the date of the enactment of this Act, the administering agencies shall develop a profile, based on the general characteristics of invasive species and vulnerable ecosystems, in order to predict, to the extent practical, whether a species planned for importation is likely to invade a particular aquatic ecosystem if introduced. In developing the profile, the above agencies shall analyze the research conducted under section 5, and other research as necessary, to determine general species and ecosystem characteristics (taking into account the opportunity for introduction into any ecosystem) and circumstances that can lead to establishment. Based on the profile, the Task Force shall make recommendations to the Invasive Species Council as to what planned importations of non-native aquatic organisms should be restricted. This profile shall be peer-reviewed.

(d) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated for carrying out this section and section 5 of this Act, and section 1102(b)(2) of the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (16 U.S.C. 4712(b)(2)) for each of the fiscal years 2004 through 2008——

(1) $4,000,000 for the Smithsonian Environmental Research Center;

(2) $4,500,000 for the United States Geological Survey, of which $500,000 shall be for developing, maintaining, and updating the database under section 5(i); and

(3) $17,000,000 for the National Oceanic and Atmospheric Administration, of which $13,000,000 shall be for the grant program under section 5(e).

SEC. 7. DISSEMINATION.

(a) IN GENERAL.—The Invasive Species Council, in coordination with the Task Force and the administering agencies, shall be responsible for disseminating the information collected under this Act to Federal, State, and local entities, including relevant policymakers, and private researchers with responsibility over or interest in aquatic invasive species.

(b) REPORT TO CONGRESS.—Not later than 3 years after the date of the enactment of this Act, the Invasive Species Council shall report actions and findings under section 6 to the Congress, and shall update this report once every 3 years thereafter, or more often as necessary.

(c) RESPONSE STRATEGY.—The Invasive Species Council, in coordination with the Task Force, the administering agencies, and other appropriate Federal and State agencies, shall develop and implement a national strategy for how information collected under this Act will be shared with Federal, State, and local entities with responsibility for determining response to the introduction of potentially harmful non-native aquatic species, to enable those entities to better and more rapidly respond to such introductions.

(d) PATHWAY PRACTICES.—The Invasive Species Council, in coordination with the Task Force and the administering agencies, shall disseminate information to, and develop an ongoing educational program for, pathway users (including vendors and customers) on how their practices could be modified to prevent the intentional or unintentional introduction of non-native aquatic species into aquatic ecosystems.

(e) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated for each of the fiscal years 2004 through 2008 $500,000 for the Invasive Species Council for carrying out this section.

SEC. 8. TECHNOLOGY DEVELOPMENT, DEMONSTRATION, AND VERIFICATION.

(a) ENVIRONMENTALLY SOUND TECHNOLOGY DEVELOPMENT, DEMONSTRATION, AND VERIFICATION.——

(1) GRANT PROGRAM.—Not later than 1 year after the date of the enactment of this Act, the Environmental Protection Agency, acting through the Office of Research and Development, in consultation with the Army Corps of Engineers and the administering agencies, shall develop and begin administering a grant program to fund research, development, demonstration, and verification of environmentally sound cost-effective technologies and methods to control and eradicate aquatic invasive species.

(2) PURPOSES.—Proposals funded under this subsection shall——

(A) seek to support Federal, State, or local officials' ongoing efforts to control and eradicate aquatic invasive species in an environmentally sound manner;

(B) increase the number of environmentally sound technologies or methods Federal, State, or local officials may use to control or eradicate aquatic invasive species;

(C) provide for demonstration or dissemination of the technology or method to potential end-users; and

(D) verify that any technology or method meets any appropriate criteria developed for effectiveness and environmental soundness by the Environmental Protection Agency.

(3) PREFERENCE.—The Administrator of the Environmental Protection Agency shall give preference to proposals that will likely meet any appropriate criteria developed for environmental soundness by the Environmental Protection Agency.

(4) MERIT REVIEW.—Grants shall be awarded under this subsection through a competitive, peer-reviewed, merit-based process.

(5) REPORT.—Not later than 3 years after the date of the enactment of this Act, the Administrator of the Environmental Protection Agency shall prepare and submit a report to Congress on the program conducted under this subsection. The report shall include findings and recommendations of the Administrator with regard to technologies and methods.

(b) DISPERSAL BARRIER RESEARCH PROGRAM.—Not later than 1 year after the date of the enactment of this Act, the Assistant Secretary of the Army for the Corps of Engineers, in conjunction with the Fish and Wildlife Service and other appro-

priate Federal agencies and academic researchers, shall establish a research, development, and demonstration program to study environmentally sound methods and technologies to reduce dispersal of aquatic invasive species through interbasin waterways and assess the potential for using those methods and technologies in other waterways.

(c) SHIP PATHWAY TECHNOLOGY DEMONSTRATION.——

(1) REAUTHORIZATION OF PROGRAM.—Section 1301(e) of the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (16 U.S.C. 4741(e)) is amended by striking "$2,500,000" and inserting "$7,500,000 for each of the fiscal years 2004 through 2008".

(2) EXPANSION OF PROGRAM.—Section 1104(b) of the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (16 U.S.C. 4714(b)) is amended——

(A) by redesignating paragraphs (4) and (5) as paragraphs (5) and (6), respectively; and

(B) by inserting after paragraph (3) the following new paragraph:

"(4) ADDITIONAL PURPOSES.—The Secretary of the Interior and the Secretary of Commerce may also demonstrate and verify technologies under this subsection to monitor and control pathways of organism transport on ships other than through ballast water.".

(3) CRITERIA AND WORKSHOP.—Section 1104 of the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (16 U.S.C. 4714) is amended by adding at the end the following new subsections:

"(d) CRITERIA.—When issuing grants under this section, the National Oceanic and Atmospheric Administration shall give preference to those technologies that will likely meet the criteria laid out in any testing protocol developed by the Environmental Protection Agency Office of Research and Development's Environmental Technology Verification Program.

"(e) WORKSHOP.—The National Oceanic and Atmospheric Administration shall hold an annual workshop of principal investigators funded under this section and researchers conducting research directly related to ship pathway technology development, for information exchange, and shall make the proceedings widely available to the public.".

(d) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated for each of the fiscal years 2004 through 2008——

(1) $2,500,000 for the Environmental Protection Agency to carry out subsection (a); and

(2) $1,000,000 for the Army Corps of Engineers to carry out subsection (b).

SEC. 9. RESEARCH TO SUPPORT THE SETTING AND IMPLEMENTATION OF SHIP PATHWAY STANDARDS.

(a) RESEARCH PROGRAM.—The Coast Guard and the Environmental Protection Agency, in coordination with the National Oceanic and Atmospheric Administration, the Task Force, and other appropriate Federal agencies and academic researchers, shall develop a coordinated research program to support the promulgation and implementation of standards to prevent the introduction and spread of invasive species by ships that shall include——

(1) characterizing physical, chemical, and biological harbor conditions relevant to ballast discharge into United States waters to inform the design and implementation of ship vector control technologies and practices;

(2) developing testing protocols for determining the effectiveness of vector monitoring and control technologies and practices;

(3) researching and demonstrating methods for mitigating the spread of invasive species by coastal voyages, including exploring the effectiveness of alternative exchange zones in the near coastal areas and other methods proposed to reduce transfers of organisms;

(4) verifying the practical effectiveness of any type approval process to ensure that the process produces repeatable and accurate assessments of treatment effectiveness; and

(5) evaluating the effectiveness and residual risk and environmental impacts associated with any standard set with respect to the ship pathway through experimental research.

(b) PERFORMANCE TEST.—Within 1 year after the date of the enactment of this Act, the Coast Guard, in conjunction with the National Institute of Standards and Technology and the Maritime Administration, shall design a performance test for ballast water exchange such as a dye study to measure the effectiveness of ballast water exchange.

(c) NATIONAL ACADEMY STUDY.—The Secretary of the Department in which the Coast Guard is operating shall enter into an arrangement with the National Academy of Sciences under which the Academy shall——

(1) identify the relative risk of transfer of various taxonomic groups by different ship modes;

(2) assess the extent to which a ballast water standard that virtually eliminates the risk of introduction of invasive species by ballast water may relate to the risk of introductions by all ship modes, and explain the degree of uncertainty in such assessment; and

(3) recommend methods for reducing organism transfers by ships by addressing all parts and systems of ships and all related modes of transport of invasive species, and identify the research, development, and demonstration needed to improve the information base to support such methods, including economic information.

Not later than 2 years after the date of the enactment of this Act, the Secretary of the Department in which the Coast Guard is operating shall transmit to the Congress a report on the results of the study under this subsection.

(d) RECOMMENDATIONS.—Not later than the later of 1 year after the date of submission of the report under subsection (c), or 3 years after the date of the enactment of this Act, the Task Force, in conjunction with the Environmental Protection Agency, the administering agencies, and other appropriate Federal and State agencies and academic researchers, shall submit to the Coast Guard a report that describes recommendations for——

(1) a ship pathway treatment standard that incorporates all potential modes of transfer by ships; and

(2) methods for type approval and accurate monitoring of treatment performance that are simple and streamlined and follow established protocols.

(e) WORKING GROUP.—Not later than 2 years after the issuance by the Coast Guard of any standard relating to the introduction by ships of invasive species, the Coast Guard shall convene a working group including the Environmental Protection Agency, the administering agencies, and other appropriate Federal and State agencies and academic researchers, to evaluate the effectiveness of that standard and accompanying implementation protocols. The duties of the working group shall, at a minimum, include——

(1) reviewing the effectiveness of the standard in reducing the establishment of invasive species in aquatic ecosystems, taking into consideration the data collected under section 5; and

(2) developing recommendations to the Coast Guard for the revision of such standard and type approval process to ensure effectiveness in reducing introductions and accurate shipboard monitoring of treatment performance that is simple and streamlined, which shall be made widely available to the public.

(f) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated——

(1) for each of the fiscal years 2004 through 2008 $1,500,000 for the Coast Guard and $1,500,000 for Environmental Protection Agency to carry out subsection (a);

(2) for each of the fiscal years 2004 through 2006 $500,000 for the Coast Guard to carry out subsection (b); and

(3) for fiscal year 2004 $500,000 for the Coast Guard to carry out subsection (c), to remain available until expended.

SEC. 10. RESEARCH IN SYSTEMATICS AND TAXONOMY.

(a) IN GENERAL.—The National Science Foundation shall establish a program to award grants to researchers at institutions of higher education and museums to carry out research programs in systematics and taxonomy.

(b) GOALS.—The goals of the program under this section are to——

(1) encourage scientists to pursue careers in systematics and taxonomy to ensure a continuing knowledge base in these disciplines;

(2) ensure that there will be adequate expertise in systematics and taxonomy to support Federal, State, and local needs to identify species;

(3) develop this expertise throughout the United States with an emphasis on regional diversity; and

(4) draw on existing expertise in systematics and taxonomy at institutions of higher education and museums to train the next generation of systematists and taxonomists.

(c) CRITERIA.—Grants shall be awarded under this section on a merit-reviewed competitive basis. Emphasis shall be placed on funding proposals in a diverse set of ecosystems and geographic locations, and, when applicable, integrated with the

United States Long Term Ecological Research Network. Preference shall be given to proposals that will include student participation, and to institutions and museums that actively train students to become experts in taxonomy and systematics.

(d) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the National Science Foundation for carrying out this section $2,500,000 each of the fiscal years 2004 through 2008.

SECTION-BY-SECTION ANALYSIS

H.R. 1081, Aquatic Invasive Species Research Act

Section 1. Short Title

This Act is named the "Aquatic Invasive Species Research Act."

Section 2. Findings

The legislation establishes several findings in support of the legislation, and finds that aquatic invasive species pose significant direct and indirect costs to the U.S. economy and environment, and that more research is needed to better direct Federal efforts toward effectively preventing the introduction of invasive species.

Section 3. Definitions

The administering agencies of the Act are defined as the National Oceanic and Atmospheric Administration, the Smithsonian Environmental Research Center and the United States Geological Survey.

The following additional terms are defined: aquatic ecosystem, ballast water, invasion, invasive species, invasive species council, pathway, species, task force, and type approval.

Section 4. Consultation and Cooperation

The administering agencies shall enter into a memorandum of agreement regarding implementation of this Act. In carrying out the Act, they shall consult with the Task Force, the Invasive Species Council, the Environmental Protection Agency and other appropriate State and Federal agencies, and shall cooperate with academic researchers.

Section 5. Ecological and Pathway Research

The administering agencies shall conduct surveys of ecosystems and of pathways (such as ships' ballast water) by which invasive species enter U.S. waters in order to track the introduction of invasive species. They shall also conduct experiments to understand the relationship between the conditions under which an invasive species is introduced and the likelihood that it will become established, and maintain a database of all of the information gathered under this section. Ecosystem surveys will review the patterns and rates of invasion at the site, track the establishment of species in ecosystems, monitor the circumstances accompanying that establishment, and document factors that may influence an ecosystem's vulnerability to invasion. Pathway surveys will identify the species being introduced through a given pathway, the quantity being introduced, and handling practices that contribute to the introduction. In carrying out this program the administering agencies will develop standardized protocols for carrying out the surveys and will coordinate their efforts to establish long-term survey sites to collect strong baseline information. A grant program is established to fund academic researchers and state agencies to carry out the surveys at diverse sites distributed geographically around the country.

Section 6. Analysis

The administering agencies shall analyze the survey and experimental results collected under Section 5. Specifically, they will, among other things, identify the highest risk pathways, identify handling practices within pathways that contribute to introductions, and evaluate how much effort is required in reducing introductions for various taxonomic groups to reduce the risk that they will become established. The agencies shall recommend and review pathway management programs to reduce introductions of invasive species. A profile, based on information about species characteristics, ecosystem characteristics and environmental circumstances that favor invasion, will be developed to predict, to the extent practical, whether a species planned for importation is likely to invade a particular ecosystem.

Authorization of Appropriations—To carry out Sections 5 and 6 for FY04 through FY08, the National Oceanic and Atmospheric Administration is authorized $17 million ($13 million of which is for the grant program), the Smithsonian Environmental Research Center is authorized $4 million, and the United States Geological Survey is authorized $4.5 million ($500,000 million of which is to administer the database).

Section 7. Dissemination

The National Invasive Species Council shall disseminate the information developed under Section 6 to relevant audiences. This includes a report to Congress, a mechanism to provide survey findings to support rapid response efforts, and dissemination to users of the various pathways invasive species exploit of information

regarding how their practices should be modified to prevent the introduction of non-native species. The National Invasive Species Council is authorized for FY04 through FY08 $500,000 million per year.

Section 8. Technology Development and Demonstration

The Act establishes and expands several programs to develop technologies to prevent, control and eradicate invasive species. These include (authorizations are for FY04 through FY08):

- The creation of an Environmental Protection Agency grant program to fund research, development, demonstration and verification of a suite of environmentally sound technologies to control and eradicate invasive species. (authorized at $2.5 million per year)
- The creation of an Army Corps of Engineers dispersal barrier research program. (authorized at $1 million per year)
- The expansion of the Ballast Water Technology Demonstration Program to include the demonstration of technologies to treat all ship pathways of introduction (including hull fouling). (authorized at $7.5 million per year)

Section 9. Research to Support the Setting and Implementation of Standards

The Act establishes a research program to support the setting, implementation and evaluation of standards for treatment of ship pathways of introduction. This includes:

- The creation of a Coast Guard and EPA research program to conduct experiments and answer relevant policy questions associated with standards and their implementation, such as the identification of possible circumstances in which a ship may encounter invasive species and in which a treatment technology must be effective. (authorized at $1.5 million for EPA and $1.5 million for Coast Guard for FY04 through FY08)
- Coast Guard research to design a performance test for ballast water exchange. (authorized at $500,000 million for FY04 through FY06)
- A study by the National Academy of Sciences to develop recommendations for a standard. (authorized at $500,000 for FY04)
- An interagency working group to evaluate the effectiveness of the standard and make recommendations for revision.

Section 10. Research in Systematics and Taxonomy

The National Science Foundation shall establish a competitive, peer-reviewed program to award grants to researchers at institutions of higher education and museums to carry out research in systematics and taxonomy. The program is authorized at $2.5 million for FY04 through FY08.

THE AQUATIC INVASIVE SPECIES RESEARCH ACT SUMMARY
BY VERNON J. EHLERS
JUNE 2003

What exactly is an invasive species?

Last summer, a voracious fish known as the Northern Snakehead became a media *cause celebre* and a serious threat to Maryland waterways. This predator wipes out native fish and once it is done feeding in one pond, it literally gets up and crawls across land to the next one. Once discovered in Maryland, Federal, State and local governments undertook rapid and successful efforts to wipe out this fish before it could establish itself and destroy native species. This is only one example out of thousands of non-native species that have been either intentionally or unintentionally introduced into United States waters. These "invasive species" take hold and multiply in ecosystems where they don't have any competition, causing tremendous economic and environmental harm. This legislation seeks to address the threat to U.S. waterways posed by all aquatic invasive species.

What harm do invasive species cause?

Invasive species can cause tremendous harm. Estimating the total economic impact of invasive species is extremely difficult, as no single organization accumulates such statistics comprehensively. However, researchers at Cornell University estimate that invasive species cost Americans $137 billion annually. This includes the cost of control, damage to property values, health costs and other factors. However, it only takes one species to cost government and private citizens billions of dollars. For example, zebra mussels have cost the various entities in the Great Lakes basin an estimated $3 billion during the past 10 years for cleaning water intake pipes, purchasing filtration equipment, etc. (Zebra mussels are bivalves native to European waters that scientists believe were first introduced to the Great Lakes through ships' ballast water exchanges in the late 1980s.)

Beyond economic impacts, invasive species cause ecological costs that are even more difficult to quantify. For example, sea lamprey control measures in the Great Lakes cost approximately $10 million to $15 million annually. However, we do not have a good measure of the cost of lost fisheries due to this invader, which was first discovered in the Great Lakes in the early 1900s. In fact, invasive species now are second only to habitat loss as threats to endangered species. Quantifying the loss due to extinction caused by these invasive species is nearly impossible.

What does the legislation do to combat invasive species?

The Aquatic Invasive Species Research Act establishes a comprehensive research program to assist policy-makers to make good decisions on the best methods to prevent invasive species from entering U.S. waters. It also enhances our ability to detect invasive species early and respond to eradicate them rapidly once they are established. The major provisions of the legislation are:

- A comprehensive ecological and pathway research program, combining surveys and experimentation, run by the National Oceanic and Atmospheric Administration, the United States Geological Survey and the Smithsonian Environmental Research Center, so that policy-makers will be able to assess how these species get into our waterways and whether or not management decisions are helping reduce invasions;
- A development, demonstration and verification program run by the Environmental Protection Agency to develop environmentally sound technologies to control and eradicate invasive species, so that Federal, State, and local managers will have more tools combat invasive species;
- A research program to support the Coast Guard's efforts to reduce the threat that ships pose for the introduction new species into U.S. waters, efforts that will spur the development of technology to prevent invasive species from entering U.S. waters;
- A grant program within the National Science Foundation to support academic research in systematics and taxonomy, so that we will maintain U.S. expertise in these areas and enhance our ability to identify invaders once they arrive; and,
- Adequate funding to conduct the necessary research to assist policy-makers in making decisions that effectively reduce this threat, and to advance the de-

velopment of the technologies necessary to control the threat. The bill is authorized at approximately $43.5 million per year from 2004 until 2008.

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