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The Argus II Bldg. • 400 Fourth St.• Ann Arbor, MI 48103-4816 • (313) 665-9135 • Fax: (313) 665-4370

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WORKSHOP PROCEEDINGS

AQUATIC NUISANCE SPECIES AND COASTAL MANAGEMENT PROGRAMS: TOWARD A REGIONAL STRATEGY IN THE GREAT LAKES BASIN

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Prepared by:
Katherine Glassner-Shwayder
Environmental Quality and Resource Management Program
Great Lakes Commission
400 Fourth Street
Ann Arbor, Michigan 48103-4816

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PREFACE

This proceedings document is based on the presentations and workgroup findings of the regional workshop (May 1995), *Aquatic Nuisance Species and Coastal Management Programs: Toward a Regional Strategy in the Great Lakes Basin.* Also included in this document is the primary product of the workshop, *A Model Comprehensive State Management Plan for the Prevention and Control of Nonindigenous Aquatic Nuisance Species.* The model is presented to the Great Lakes states as guidance in developing comprehensive state management plans under Section 1204 of the federal *Nonindigenous Aquatic Nuisance Prevention and Control Act* (P.L. 101-646) *(NANPCA)*. The workshop proceedings, associated workshop and model management plan were made possible by a grant from the National Oceanic and Atmospheric Administration to the Michigan Department of Natural Resources under Section 308 of the Coastal Zone Management Act.

These proceedings were prepared by the staff of the Great Lakes Commission's Resource Management and Environmental Quality Program. The document was compiled and edited by Katherine Glassner-Shwayder. Glassner-Shwayder also was responsible for the organization and conduct of the workshop on which the proceedings are based. Additional project support was provided by Tom Crane and Lori Reynolds. Members of the Great Lakes Panel on Aquatic Nuisance Species, representatives from coastal management programs, and all other workshop participants were critical to the success of the workshop and the ensuing production of these proceedings.

Special acknowledgment is warranted for two individuals. First is Chris Shafer, chief of the Great Lakes Shoreline Section, Michigan Department of Natural Resources. Shafer, who manages Michigan's Coastal Management Program, was instrumental in securing the project grant and ensuring strong, multistate involvement by coastal managers. Acknowledgment also is extended to Jay Rendall, exotic species program coordinator, Minnesota Department of Natural Resources. Mr. Rendall, who chairs the Great Lakes Panel on Aquatic Nuisance Species, played a critical leadership role in project design and conduct.

Questions and comments on this document can be directed to the Great Lakes Commission at: The Argus II Building, 400 Fourth Street, Ann Arbor, MI 48103-4816; phone: 313-665-9135; fax: 313-665-4370; e-mail: glc@great-lakes.net.

Michael J. Donahue, Ph.D.
Executive Director
Great Lakes Commission

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May 2-3, 1995
Ann Arbor, Michigan

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I. EXECUTIVE SUMMARY

The following document presents proceedings from the workshop, *Aquatic Nuisance Species and Coastal Management Programs: Toward A Regional Strategy in the Great Lakes Basin*, held May 2-3, 1995 in Ann Arbor, Michigan. This workshop was part of a larger initiative taken on by the Great Lakes Commission with guidance from the Great Lakes Panel on Aquatic Nuisance Species and Great Lakes state coastal managers, to strengthen Great Lakes regional policy on the prevention and control of aquatic nuisance species. The primary outcome of the workshop, which brought together aquatic nuisance species (ANS) specialists and state coastal managers of the Great Lakes region, was the production of *A Model Comprehensive State Management Plan for the Prevention and Control of Aquatic Nuisance Species*. Also during the workshop, significant progress was made in developing strategies on how to implement the state management plans with tools available in coastal management programs. The model management plan, presented in **Appendix A** of this document, was developed as guidance to the Great Lakes states on their state management plans as called for in the *Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990* (P.L. 101-646) (*NANPCA*). The workshop proceedings were prepared as support in use of the model management plan. Project activities were made possible by a grant from the National Oceanic and Atmospheric Administration to the Michigan Department of Natural Resources under Section 308 of the Coastal Zone Management Act.

This document opens with an overview of the project goals, objectives and methodology. The proceedings from the workshop are then presented. The plenary sessions of the workshop, designed to inform/update workshop participants on issues pertinent to the development of a Great Lakes regional strategy on ANS prevention and control, are summarized under the following panels as conducted at the workshop: 1) Aquatic Nuisance Species and Coastal Management Issues and Impacts; 2) Aquatic Nuisance Species Planning Initiatives and Needs; 3) Coastal Management Programs and ANS Issues; 4) A Model to Guide the Development of State Management Plans. Four concurrent workgroup sessions followed the plenary sessions, providing an opportunity for participants to discuss elements needed for the development and implementation of the model management plan. The results from the workgroup sessions also are summarized in these proceedings. Concluding remarks include a set of recommendations for states in expanding and refining the model state management plan, based on workshop findings. A distribution strategy for this document also is presented.

Project accomplishments involving the workshop and development of the model management plan are as follows:

- Recognition that the problems caused by aquatic nuisance species raise interjurisdictional challenges that will require a regional strategy for ANS prevention and control based on partnerships among federal, state, provincial and local agencies, and non-governmental groups.

- Increased awareness of a broad array of ANS issues among ANS officials, representatives from coastal management programs in the Great Lakes region and other individuals with vested interests in the prevention and control of aquatic nuisance species.

- Agreement among representatives of the Great Lakes states to use a model state management plan as guidance to help promote regional consistency in the development of their state management plans for ANS prevention and control.

- Consensus on the following topics for goals on which to base the model comprehensive state management plan for ANS prevention and control:

  Goal I: Preventing new ANS introductions;
  Goal II: Limiting the dispersal of aquatic nuisance species already established in the Great Lakes; and
  Goal III: Abating harmful ANS impacts.

- Consensus on the model hierarchy, which includes a goal statement, problem definition, and recommended strategies and tasks needed to accomplish stated goals.

- General agreement that a strong linkage exists between aquatic nuisance species issues and coastal management programs. Some of the tools recommended from coastal management programs to strengthen ANS prevention and control efforts (such as implementation of the comprehensive state management plans) include federal consistency, permit conditions, education and outreach programs, networking of state agencies, funding opportunities through grants under the Coastal Zone Management Act, and promotion of legislation and policy supporting ANS prevention and control through coastal management programs.

The regional workshop and the model management plan, during its various phases of review, received commendations by several participating ANS specialists and coastal managers. The workshop was considered a valuable opportunity for participants to strategize on how to address ANS issues as part of their state programs. The workshop also provided a forum for workshop participants to initiate a network approach between ANS specialists and coastal managers in their work on ANS issues. Positive feedback also was received on the model management plan which is actively being used by several Great Lakes states in the development of their state management plans for ANS prevention and control.

II. INTRODUCTION: PROJECT GOALS AND OBJECTIVES

Nonindigenous aquatic nuisance species are causing detrimental impacts in the Great Lakes Basin, particularly in coastal areas. Aquatic nuisance species have altered the Great Lakes ecosystem and caused costly socio-economic damages. The zebra mussel, a classic example, has taught us how aquatic nuisance species can threaten the biodiversity of the Great Lakes aquatic community by competing with native species. There also is evidence of how the zebra mussel has caused changes to the food web by filtering microscopic plants and animals from the water column, which could potentially reduce fish populations. The economic impacts caused by zebra mussels also have raised concern in the Great Lakes region due to considerable expenditures resulting from clogged municipal and industrial water impact pipes. The menagerie of aquatic nuisance species that have become established in the Great Lakes and inland waters of the region present a wide variety of ecological, socio-economic problems to Great Lakes water users. As the introduction and spread of aquatic nuisance species continue, the associated problems intensify, as does the need for their prevention and control.

The Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (P.L. 101-646) *(NANPCA)* addresses aquatic nuisance species (ANS) problems in the United States. Although the zebra mussel invasion of the Great Lakes played a central role in prompting passage of the federal legislation, *NANPCA* has a national focus to its programs for preventing new ANS introductions and limiting the dispersal of aquatic nuisance species already in U.S. waters.

Under Section 1204 of *NANPCA*, the states are called upon to develop comprehensive state management plans for ANS prevention and control. The legislation stipulates that the state management plan "identifies those areas or activities within the state, other than those related to public facilities, for which technical and financial assistance is needed to eliminate or reduce the environmental, public health, and safety risks associated with aquatic nuisance species." Each state plan is to focus on the identification of feasible, cost-effective management practices and measures to be taken on by state and local programs to prevent and control ANS infestations in a manner that is environmentally sound. The development of a state management plan, as called for in Section 1204 provides an opportunity for federal cost-share support for implementation of the plan, pending plan approval by the national Aquatic Nuisance Species (ANS) Task Force.

To address the challenges posed by ANS invasions of the Great Lakes and inland waters of the region, the Great Lakes Commission has identified the need for a regional strategy on ANS prevention and control. This regional strategy is addressed in the project, *Aquatic Nuisance Species and Coastal Management Programs: Toward A Regional Strategy in the Great Lakes Basin*, conducted under the leadership of the Great Lakes Commission with guidance from the Great Lakes Panel on Aquatic Nuisance Species and state coastal managers of the Great Lakes region. Project activities were made possible by a grant from the National Oceanic and Atmospheric Administration to the Michigan Department of Natural Resources under Section 308 of the Coastal Zone Management Act.

The two primary goals of the project are: 1) to develop a model comprehensive state management plan to provide guidance on a regional basis to the Great Lakes states in the development of their individual state management plans as called for under *NANPCA*; and 2) to establish a network between ANS programs and state coastal management programs to strengthen ANS prevention and control strategies. Other objectives related to the project goals are to raise awareness of ANS issues among Great Lakes state coastal managers; investigate how ANS prevention and control tactics can be incorporated in coastal management plans; and identify the mechanisms/authorities that currently exist in coastal management programs to facilitate implementation of state management plans.

Toward this end, a regional workshop, *Aquatic Nuisance Species and Coastal Management Programs: Toward A Regional Strategy in the Great Lakes Basin,* was held May 2-3, 1995, in Ann Arbor, Michigan. The workshop laid the groundwork for development of the model state management plan for ANS prevention and control. The workshop also served as a forum to initiate a network approach between ANS specialists and state coastal managers to address ANS issues.

The information presented at the regional workshop is summarized in the proceedings that follow. These proceedings, which provide support for use of the model state management plan for ANS prevention and control, have been developed to promote and facilitate the development and implementation of respective ANS plans and programs in each state.

III. METHODOLOGY

The following methodology was pursued in support of the project goals and objectives, under the direction of the Great Lakes Commission with guidance from the Great Lakes Panel on Aquatic Nuisance Species and state coastal managers of the Great Lakes region.

Project Scoping: An oversight committee was selected to provide guidance for project activities. Committee members, comprised of representatives from both aquatic nuisance species (ANS) programs and Great Lakes coastal management programs (CMPs), convened for a project planning meeting in February 1995 in Ann Arbor, Michigan (refer to **Appendix D** for listing of oversight committee members). The focus of the meeting was to develop a strategy on how state ANS programs and CMPs can build partnerships to strengthen a regional policy on ANS prevention and control in the Great Lakes region. Committee members agreed that a regional workshop would be the appropriate mechanism to initiate such efforts. They also strongly supported the development a model comprehensive state management plan to provide guidance on a regional basis to the Great Lakes states in the development of their individual state management plans as called for under the *Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990* (P.L. 101-646) *(NANPCA)*. The following project objectives were recommended by the oversight committee:

- Increase awareness of ANS issues through state programs;
- Integrate ANS issues with CMPs;
- Facilitate development of state management plans by developing the framework (template) on which detail can be incorporated by the states;
- Identify the mechanisms/authorities (i.e., state and federal statutes) that currently exist in CMPs to facilitate the implementation of the ANS state management plans;
- Incorporate tools from CMP plans (i.e., statutes and regulations) into ANS state management plans to facilitate implementation;
- Provide coastal managers with an understanding of the diverse issues involved in ANS prevention and control;
- Raise awareness among ANS officials on how CMP plans can facilitate implementation of state management plans;
- Gain legislative support for ANS state plans; and
- Assist Great Lakes states in efforts to acquire federal funds for relevant planning and implementation efforts.

Also discussed during the planning meeting was the basic design of the regional workshop. It was recommended that the event should run two days, providing both plenary and workgroup sessions to achieve the goals and objectives of the project. It was suggested that the plenary sessions provide background on ANS programs and CMPs as well as updates on ANS issues pertinent to the state management plans. Workgroup sessions were identified as an opportunity for the interactive discussion needed to develop the model state management plan and to identify tools from the CMPs to facilitate implementation of the state plans.

The members of the oversight committee played an instrumental role in providing lists of potential workshop participants. Members also provided summaries of ANS programs and CMPs used in a packet of background information prepared for workshop participants.

Research and Analysis: Great Lakes Commission staff researched and reported on the current status of ANS prevention and control efforts in the Great Lakes Basin, with an emphasis on impacts and implications for the coastal zone. Research was based on resources provided by the state natural resource/coastal management agencies in the Great Lakes region, as well the Great Lakes Panel on Aquatic Nuisance Species. The primary lesson gained from extensive research efforts was the need to reflect an ecosystem approach in addressing ANS issues, both in the workshop and the development of the model state management plan, which should include, among others, ecological, socio-economic and public health considerations, as well as interjurisdictional dynamics.

Research findings were used to develop a packet of background information for workshop participants. (These information packets are available from the Great Lakes Commission.) The information packet consists of summaries of state ANS programs and CMPs from several Great Lakes states, provided by lead ANS and coastal management officials. The state summaries on ANS programs provide information on program authorization, status reports on program activities, opportunities to integrate ANS activities with coastal management programs, and relevant statutes and regulations that are being used or could potentially be used in the prevention and control of aquatic nuisance species. The packet also includes an initial draft model of the state management plan which was discussed and evaluated during the workshop described below. Other documents found in the packet include a copy of *NANPCA*, the May issue of the *ANS UPDATE* newsletter, information on U.S. Coast Guard regulations on Great Lakes ballast water management, zebra mussel invasion of inland lakes in Michigan and Chesapeake Bay policies relating to nonindigenous aquatic nuisance species.

Project Workshop: The workshop, held May 2-3, 1995, in Ann Arbor, Michigan, brought together almost 60 ANS and CMP specialists from state and federal agencies, as well as tribal authorities and researchers (refer to **Appendix E** for listing of workshop participants and **Appendix F** for workshop agenda). The contributions of these participants, both through presentations and interactions in workgroup sessions, were critical to the development of the model management plan for ANS prevention and control. The workshop forum also provided an opportunity for ANS specialists and coastal managers to become aware of each other's programs or potential programs on ANS issues, setting the stage for future working relationships and establishing a network approach to strengthen ANS prevention and control initiatives.

Development of Model State Management Plan for the Prevention and Control of Nonindigenous Aquatic Nuisance Species: A model comprehensive state management plan was developed to provide guidance on a regional basis to the Great Lakes states in the development of their individual state management plans as called for under *NANPCA* (refer to introductory section (pages 3-4 for further detail on the state management plans). An initial draft model of the state

management plan, distributed to workshop participants for evaluation, was further developed and refined based on workshop presentations and findings brought forth during the workgroup sessions. The model was then distributed to workshop participants and Great Lakes Panel members in mid-August for review and preliminary use. Based on the comments received from this initial review, a final draft of the model was completed in November and distributed to members of the Great Lakes Panel and the national Aquatic Nuisance Species (ANS) Task Force for final review. The final version of the model, titled *A Model Comprehensive State Management Plan for the Prevention and Control of Nonindigenous Aquatic Nuisance Species* can be found in **Appendix A** of these proceedings.

Technical Assistance: The project team is providing post-workshop support and assistance to ensure that project findings and recommendations are considered and incorporated in state plans and programs addressing ANS issues. As part of this effort, these proceedings, which include the model state management plan, will be distributed to members of the Great Lakes Panel, Great Lakes state coastal managers and other participants in the regional workshop. Also, efforts will be made to promote and facilitate the development and submittal of state management plans under *NANPCA* and provide guidance to coastal managers on how ANS issues can be addressed as part of coastal management activities.

IV. WORKSHOP PROCEEDINGS: *AQUATIC NUISANCE SPECIES AND COASTAL MANAGEMENT PROGRAMS: TOWARD A REGIONAL STRATEGY IN THE GREAT LAKES BASIN*

Introductory Remarks

Project Goals and Objectives, Katherine Glassner-Shwayder, Great Lakes Commission

To address the challenges posed by nonindigenous aquatic nuisance species (ANS) invasions of the Great Lakes region, the Great Lakes Commission has identified the need for a regional strategy for ANS prevention and control. This regional strategy is addressed in the project, *Aquatic Nuisance Species and Coastal Management Programs: Toward A Regional Strategy in the Great Lakes Basin*, conducted under the leadership of the Great Lakes Commission with guidance from the Great Lakes Panel on Aquatic Nuisance Species and state coastal managers of the Great Lakes region. In developing a regional strategy for ANS prevention and control, an ecosystem approach has been taken to include both the prevention of new ANS introductions into the Great Lakes and inland waters of the region, and control of the dispersal of those species already established in the Great Lakes Basin. Also encompassed in this ecosystem approach are ecological, socio-economic and public health considerations, as well as the interjurisdictional elements critical to the success of implementing a regional strategy for ANS prevention and control.

The two primary goals of the project are: 1) to develop a model comprehensive state management plan to provide guidance on a regional basis to the Great Lakes states in the development of their individual state management plans as called for under *NANPCA*; and 2) to establish a network between ANS programs and coastal management programs to strengthen ANS prevention and control strategies. Other objectives related to the project goals are to raise awareness of ANS issues among Great Lakes state coastal managers; investigate how ANS prevention and control tactics can be incorporated in coastal management plans; and identify the mechanisms/authorities that currently exist in coastal management programs to facilitate the implementation of state management plans.

The workshop will serve as the primary mechanism to achieve project goals and objectives. The first day of the workshop focuses on the discussion of key issues regarding aquatic nuisance species and their impacts. Presentations will provide information on ongoing initiatives and opportunities for ANS prevention and control in the Great Lakes and inland waters of the region. These discussions will be led by policymakers, research scientists, natural resource agents and coastal managers on a variety of ANS issues, programs and activities.

The second day of the workshop will commence with presentations from representatives of the Great Lakes states on goals for ANS prevention and control, including progress reports regarding state planning efforts. Also presented will be a draft model state management plan for ANS prevention and control that, in its final form, will be used as guidance by the states in the

development of their comprehensive state management plans for ANS prevention and control. Workgroup sessions will be convened to further expand and refine the model state management plan. Other objectives of the workgroup sessions include: assembling a tool box for use in implementation of the state plans, including funding mechanisms; and identifying enforceable policies and statutes that coastal management plans can use for ANS prevention and control.

The findings generated at this workshop will be summarized in a proceedings document. These proceedings, including the model state management plan for ANS prevention and control, have been developed to promote and facilitate the development and implementation of ANS plans and programs.

Aquatic Nuisance Species Programs in the Great Lakes Region, Jay Rendall, Minnesota Department of Natural Resource, Chair of the Great Lakes Panel on Aquatic Nuisance Species

The introduction of nonindigenous aquatic nuisance species into the Great Lakes region has been occurring for more than a century through a variety of pathways. Some of the pathways of ANS introduction and dispersal include ballast water release by transoceanic vessels, inland recreational boaters and horticultural activities. In recent years, ANS introductions have become more numerous, adversely affecting more waters of the Great Lakes region, threatening a larger number of native aquatic species and causing significant economic losses.

Increased awareness of ANS problems, generated by high-profile species such as the zebra mussel, has lead to actions at the federal, state and local levels to address ANS problems. In the Great Lakes region, there are many agencies, organizations and partnerships that work on ANS issues. A catalyst for many of the activities is the *Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990* (P.L. 101-646) *(NANPCA)*.

On the federal level, the U.S. Coast Guard is called upon under *NANPCA* to establish and implement regulations to prevent the introduction of aquatic nuisance species into the Great Lakes via ballast water. The national ANS Task Force, co-chaired by the U.S. Fish and Wildlife Service and National Oceanic and Atmospheric Administration, is responsible under *NANPCA* to establish a national ANS program to coordinate prevention, detection and monitoring, and control activities. Under the ANS Task Force, the Ruffe Control Committee has been assigned to develop a plan for the control of ruffe, a nonindigenous fish species that is rapidly expanding its range along the southern shore of Lake Superior. The Sea Grant programs in the Great Lakes states, supported with both federal and state funding, conduct research and education on zebra mussels and other aquatic nuisance species in the Great Lakes region.

The Great Lakes Fishery Commission, a binational agency established in 1955, has led the battle to control sea lamprey in the Great Lakes. Currently the Fishery Commission is working with the U.S. Fish and Wildlife Service and Canadian agencies in the conduct of sea lamprey control work and research, as well as on control efforts for ruffe.

On a regional level, the Great Lakes Panel on Aquatic Nuisance Species was convened under *NANPCA*. The Panel, with representation from federal, state and local agencies as well as environmental and commercial interests, coordinates information/education activities, policy/legislation and research initiatives on a regional level.

State agencies are authorized under *NANPCA* to develop state management plans for ANS prevention and control. Despite funding constraints, several Great Lakes states are making progress on plan development and related activities.

Local agencies, such as counties, cities and lake associations also can play an important role in ANS prevention and control efforts. Some of these activities include volunteer monitoring programs, promotion of state laws and local ordinances, and involvement in information/ education activities to raise public awareness and inform decisionmakers on ANS issues.

Coastal Management Programs in the Great Lakes Region, Chris Shafer, Michigan Coastal Management Program, Michigan Department of Natural Resources

On a national level, the Coastal Management Programs (CMP) are authorized under the Coastal Zone Management Act (CZMA), originally passed in 1972. Under CZMA, Congress provides the states with a national policy to: 1) preserve, protect, develop and, where possible, restore and enhance resources of the nation's coastal zone; and 2) encourage and assist the states to effectively exercise their responsibilities for coastal management through the development and implementation of programs to achieve wise use of land and water resources of the coastal zone, giving full consideration to ecological, cultural, historic, aesthetic values as well as the needs for compatible economic development. The CZMA enables coastal states, including the Great Lakes states, to develop a CMP to improve protection of sensitive shoreline resources, to identify coastal areas appropriate for development, to designate areas hazardous to development, and to improve public access to the coastline.

In the Great Lakes region, four states have federally approved programs, including Michigan, Wisconsin, Pennsylvania and New York. The states of Ohio, Indiana and Minnesota are in the process of developing their state plans for federal approval. The programs are typically developed and implemented as part of one of three structures: a natural resource department (e.g., Michigan), a state planning office (e.g., Maine), or a separate, statutorily created agency (e.g., California Coastal Commission). Illinois is not presently participating in the coastal management program.

Traditionally, CMPs are more oriented toward land use and address control and development activities as well as the protection of hazard-prone areas along the shoreline such as wetlands, sand dunes and other unique features. Generally, state coastal programs regulate shore protection structures, dredging and filling activities, marina construction, new development, and flood-prone and high-risk erosion areas. States also promote improved public access and waterfront redevelopment activities through various programs and financial assistance. In the past several

years, coastal programs are looking more to the "wet-side" of their coastal areas. Ocean and marine states have recently begun focusing on ocean management activities beyond the state's 12-mile territorial seas. Also, more attention recently has been focused on the protection of cultural resources, such as shipwrecks and other maritime artifacts. Increased attention has been devoted to the states' public trust responsibilities over their submerged lands.

Two primary incentives exist for the states to participate in the federal coastal program: financial assistance and federal consistency. Under Section 306 of the CZMA, federal assistance implementation grants are awarded to the states with federally approved CMPs. In the Great Lakes region, these grants range from $600,000 to $2.1 million dollars annually, depending on the shoreline population and coastline mileage of individual states. Section 306 funds are generally used for planning activities, site design, engineering feasibility and natural features studies, historic preservation projects, coastal education materials, development of portions of local zoning ordinances, master planning of coastal significance and waterfront development studies. Project selection is competitive and based on how well each project meets coastal program objectives.

States generally pass a portion of their federal grants through to other state agencies and local units of government for planning, site design, engineering, scientific studies, regulatory programs and enforcement activities. Opportunities for ANS project funding exist under the state coastal programs in areas such as policy and scientific research, monitoring programs, information/ education activities and enforcement of existing statutes. To date, the coastal states have not actively been involved in funding ANS projects. These funding opportunities will be explored during the discussions of this workshop.

The federal consistency provision of CZMA is the other incentive for the states to participate in a federally-approved coastal program. Federal consistency requires that the federal agencies conducting projects in the coastal zone (such as construction activities, grant awards, or federal licenses or permitting activities) must be consistent with state law. This provision gives the states considerable authority and the ability to work with federal agencies on equal status. The authority under the federal consistency provision holds potential for addressing ANS issues. This idea will be pursued during the workshop. (Refer to **Appendix C** and Ellen Brody's presentation, *The Role of Federal Consistency and Other Coastal Zone Management Tools in ANS State Management Plans* (pages 21-24), for further detail on federal consistency.)

Opportunities do exist for ANS officials and state coastal managers to build working relationships and to support each other's missions and programs. We look forward to identifying and strengthening these opportunities and linkages between coastal management and ANS programs.

Panel 1: Aquatic Nuisance Species and Coastal Management Issues and Impacts

The Status of Ballast Water Invasions and Management in the Great Lakes, Dr. James Carlton, Director of Maritime Studies and Professor of Marine Sciences, Williams College, Mystic Seaport

A plethora of species new to American waters has become established due to ballast water and sediment release, and it appears that the number is steadily growing. Introduced species have been identified by the National Research Council as one of the five most pressing issues now facing the conservation of marine and aquatic biodiversity. Ballast water invasions continue, and they will continue for some years to come. National and international regulations (now largely voluntary) call for ballast water management interface with a huge maritime industry that directly involves more than 150 nations with a staggering variety of vessels of different sizes, cargoes, age, condition, routes and ballasting requirements. Vessels are being built in 1995 with an expected at-sea life of 25 or more years, without regard to ballast management considerations.

In efforts to prevent new introductions of nonindigenous aquatic nuisance species, ballast water management guidelines have been established as federal law in the Great Lakes under the *Nonindigenous Aquatic Nuisance Prevention and Control Act* (P.L. 101-646) *(NANPCA)*. The U.S. Coast Guard issued regulations in May 1993 that required vessels bound for the Great Lakes to exchange their water, if possible, on the high seas (in depths greater than 2,000 meters or 6,600 feet) to achieve a minimum salinity of 30 parts per thousand. Most vessels coming through Massena, New York (where the Coast Guard boards vessels test ballast water), have exchanged most or some of their water and have salinities greater than 30 parts per thousand. The four vessels that failed to meet salinity requirements in the 1993 and 1994 seasons were dealt with by adding salt, chlorination and by heat treatment. The word has gone out to the maritime industry that ships could be found in violation of the new ballast laws, and thereby stopped.

Problems have arisen with open ocean ballast exchange, ranging from limited effectiveness to concerns about crew and ship safety. In addition, it is becoming apparent that primary concern should not focus strictly on whether or not a vessel has exchanged its ballast water as it is currently viewed and calculated in official statistics, but rather on how much ballast was exchanged. These challenges are leading committee and research groups around the world to look toward more long-term solutions. These solutions are specifically focused on treatment of the ballast water aboard ship either while the water is being boarded, while the ship is underway or when the water is being released.

No new established invasions due to ballast water have been reported in the Great Lakes since earlier Canadian voluntary guidelines came into effect in May 1989. (This does not mean that no new invasions have occurred, since reports of new invasions lag behind the actual colonization event by two to five or more years.) However, it is important to emphasize that ballast regulations should not be expected to cease all future invasions; but rather, ballast regulations should be expected to profoundly diminish the number of new invasions into the Great Lakes.

The fact that "leakage" can still occur, even with regulations in place, is indicated by the discovery in 1994 of young European flounder in Lake Superior. These individuals must have been transported by ballast water subsequent to 1989. They may have arrived in water from ships that declared that they had "no ballast on board." Such ships (referred to as "NOBOB's"), however, often have enough "residual" water on board to carry organisms.

A combination of actions are needed to insure there are fewer invasions in the future. These include increased awareness of the need for ballast water management by the maritime industry, diligent attempts to affect ballast exchange operations that are safe for crew and ship, and the addition of new technological systems that will treat ballast water on the ship (e.g., thermal, ultraviolet, chemical, ultrasound, filtration, etc.).

Regulatory Control of Nonindigenous Species in Ballast Water on Vessels Entering the Great Lakes, Lt. Katherine Weathers, U. S. Coast Guard, Chief of the Marine Port and Environmental Safety Branch

The Great Lakes is the first place where the United States has established a regulatory regimen against the introduction of nonindigenous species carried in ballast water. U.S. regulations, (at 33 CAR 151 Subpart C) implementing mandatory compliance with *Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990* (P.L. 101-646) (*NANPCA*) went into effect on May 10, 1993. These regulations apply to all vessels that have operated outside the Exclusive Economic Zone (EEZ) of either the U.S. and Canada to control the discharge of ballast into the Great Lakes. Enforced by the U.S. Coast Guard at Massena, New York, with active assistance from the Canadian Coast Guard and the Seaway authorities, the regulations require that the level of salinity in the ballast water equals or exceeds 30 parts per thousand (ppt). (The salinity of normal sea water ranges from 34 to 36 ppt.) Compliance with the requirements of the regulations can be met with one of the following three options: 1) ballast water exchange at sea beyond the EEZ in a depth of at least 2,000 meters; 2) retaining the vessel's ballast water onboard during the entire voyage within the Great Lakes; or 3) implementation of an alternative environmentally sound method of ballast water management that must be first approved by the commandant of the U.S. Coast Guard.

Although the current regulatory regime on ballast water management has addressed a large portion of the ballast transport problem, there is still a significant problem with the unpumpable ballast residue for which regulations do not yet exist. There is concern that current ship designs leave a residual amount of ballast water in the tanks after a complete discharge operation. As a result, the organisms carried in the unpumpable ballast residue are available for discharge when more water is added to the ballast tank, allowing the release of these organisms into the Great Lakes from vessels with multiple destinations in the Basin. Since a large number of vessels entering the Great Lakes (approximately 95 percent of the 400 to 700 vessels entering each year) carry unpumpable ballast, additional regulatory action may prove necessary to strengthen the line of defense against new introductions of aquatic nuisance species.

Zebra Mussel Invasion of Inland Waters of Michigan, Paul Marangelo, University of Michigan, Research Associate, Mystic Seaport Museum

In 1993, the first systematic widespread sampling of inland waters in North America for the presence of zebra mussels was initiated to assess the incidence of overland dispersal into inland freshwater systems in the Lower Peninsula of Michigan. The 33 lakes targeted for this survey were considered to be at high risk of zebra mussel invasion due to large size, close proximity to infested waters, or the presence of public access sites, characteristics which typify lakes with higher levels of transient boating activity. Zebra mussels were detected in 10 of these lakes, thus providing a limited initial assessment of its inland range expansion.

The sampling program was continued in 1994 with the goal of expanding the scale of zebra mussel monitoring in inland lakes to construct a basis for refining inferences on the rates, direction and spatial patterns of the spread of zebra mussels that were generated in the 1993 season. Existing inland populations were monitored to investigate the early population dynamics of zebra mussel invasions, and derive predictive models of the timing and magnitude of future population growth and associated impacts. A total of 15 new inland lake infestations were documented in 1994.

As of January 1995, a total of 26 Michigan inland lakes displayed some evidence of zebra mussel infestation, and 15 lakes had confirmed populations of adult zebra mussels. Secondary dispersal from established inland populations has proved to be a significant factor in the development of new infestations, including downstream and interwatershed transport. The discrete inoculation of zebra mussels in Michigan's inland lakes was found to be another significant mechanism contributing to primary invasions. The results from this research clearly show that zebra mussels are continuing their range expansion at a rate that will infest a considerable number of inland lakes in Michigan within the next decade.

The Economic Impact of Zebra Mussels on Public Facilities, Dr. Leroy Hushak, Research Investigator, Ohio Sea Grant

The zebra mussel infestation has imposed large costs on facilities that draw water from the Great Lakes: electric generating plants, municipal water systems and industrial water users. For example, the largest fossil-fueled plant in the world, Detroit Edison's power plant in Monroe, Michigan had to shut down in 1989 because zebra mussels literally plugged up the water system. Since that time, this rapidly reproducing mollusk has spread throughout the Great Lakes, its tributaries, and many major rivers and inland lakes. The zebra mussel has reportedly infested hundreds of facilities that use raw water, such as municipalities' drinking water facilities, industries and power generating plans. Despite these widespread damages, there has been little systematic information to identify the infested facilities, the costs of monitoring, cleaning and controlling the infestations, and whether the best methods are being used to minimize the costs.

Research is being conducted by Ohio Sea Grant to determine water user expenditures on zebra mussel monitoring and control in the Great Lakes region. As of May 1995, a survey to document zebra mussel control costs was sent to 1,500 facilities on the Great Lakes, Great Lakes tributaries, and selected facilities on nearby streams and lakes that draw surface water into their facilities. Of the 400 facilities that responded, approximately one quarter are utilities, one quarter are municipalities and half are industries. The average total expenditures of facilities on the Great Lakes was determined to be $513,600 over the five-year period from 1989 to 1994. Respondents with Great Lakes water intakes include 32 of 48 facilities with more than 50 million gallons per day (mgpd) of intake capacity. Reported costs range from less than $20,000 per year for smaller water intakes (5 mgpd or less) to $350,000 or more per year for those in excess of 300 mgpd.

Few of the large water users that were heavily impacted by zebra mussels are included in the respondents of the survey. Efforts are currently underway to obtain more responses, especially from the large, heavily impacted facilities; and to determine if the facilities that did not respond are similar to those that did.

Panel 2: Aquatic Nuisance Species Planning Initiatives and Needs

Federal Activities on Aquatic Nuisance Species, Jay Troxell, U.S. Fish and Wildlife Service and Allegra Cangelosi, Northeast-Midwest Institute

The *Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990* (P.L. 101-646) *(NANPCA)* is the federal legislation established to prevent the occurrence of new ANS introductions and to limit the dispersal of aquatic nuisance species already in U.S. waters. The act provides an intergovernmental mechanism for development of a cooperative national program to address the following objectives:

- reduce the risk of or prevent the unintentional introduction and dispersal of nonindigenous aquatic species that may be nuisances;
- ensure prompt detection of the presence of and monitor changes in the distribution of nonindigenous aquatic nuisance species; and
- control established aquatic nuisance species in a cost-effective, environmentally sound manner.

The national Aquatic Nuisance Species (ANS) Task Force, co-chaired by the U.S. Fish and Wildlife Service and the National Oceanic and Atmospheric Administration, was established under Section 1201 of *NANPCA* to coordinate governmental efforts related to nonindigenous aquatic nuisance species in the United States with those of the private sector and other North American interests. An important role of this federal group in the implementation of *NANPCA* is to establish national policy direction in support of the act. The ANS Task Force (consisting of seven federal agency representatives and eight ex officio members representing non-federal governmental entities) has adopted the *Aquatic Nuisance Species Program* under Section 1202 of the act which recommends the following essential elements:

- ***Prevention***: Establish a systematic risk identification, assessment and management process to identify and modify pathways by which nonindigenous aquatic nuisance species spread.
- ***Detection and Monitoring:*** Create a National Nonindigenous Aquatic Nuisance Species Information Center to coordinate efforts to detect the presence and monitor the distributional changes of all nonindigenous aquatic nuisance species, identify and monitor native species and other effects, and serve as a repository for that information.
- ***Control***: The task force or any other potentially affected entity may recommend initiation of a nonindigenous aquatic nuisance species control program. If the task force determines, using a decision process outlined in the control program, that the species is a nuisance and control is feasible, cost-effective and environmentally sound, a control program may be approved.

The ANS Task Force recommends research, education and technical assistance as strategies to support the elements listed above.

The ANS Task Force also provides national policy direction as a result of protocols and guidance that have been developed through the efforts of the following working committees: Research Protocol Coordination Committee, Intentional Introduction Policy Review Committee, Great Lakes Panel on Aquatic Nuisance Species, Ruffe Control Committee, Risk Assessment and Management Committee, Detection and Monitoring Committee, Zebra Mussel Coordination Committee and Brown Tree Snake Control Committee.

A critical role of the federal government in the prevention of unintentional introductions of aquatic nuisance species is defined under Section 1101 of *NANPCA*, which mandates the establishment of regulations for ballast water management aimed at limiting introductions through transoceanic shipping. U.S. regulations control the discharge of ballast from all vessels entering Great Lakes waters, thus far the only region in the United States to be regulated. The regulations have been enforced by the U.S. Coast Guard since May 1993, with active assistance from the Canadian Coast Guard and Seaway Authorities. (The Canadian federal government has yet to enact federal ballast water management regulations, however, voluntary guidelines are in place.) The need has been identified for a federal research program to develop innovative technology for ballast water management.

The federal legislation to reauthorize *NANPCA* is in the preparation stages as of May 1995. This legislation is designed to extend and possibly modify or expand national ANS programs. The U.S. Fish and Wildlife Service is developing an administration proposal in consultation with ANS Task Force and congressional committees; both have received regional guidance from the Great Lakes Panel. The reauthorization bill will recommend a national voluntary program to prevent new introductions. Other proposed changes will include emergency authority for the ANS Task Force co-chairs to address urgent situations, and increased opportunities for other regions to form coordinating councils like the Great Lakes Panel on Aquatic Nuisance Species.

New York State's Nonindigenous Aquatic Species Comprehensive Management Plan: How Do We Get to the Goal of ANS Prevention and Control, Tim Sinnott, New York Department of Environmental Conservation

New York is the first and only Great Lakes state (as of May 1995) to complete a state management plan that has been approved by the national ANS Task Force. In August 1991, the New York State Legislature directed New York State's Department of Environmental Conservation to prepare a state management plan for the prevention and control of nonindigenous aquatic nuisance species consistent with the requirements of Section 1204 of the federal *Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990* (P.L. 101-646) (*NANPCA*).

To identify public needs and concerns, an ad hoc committee was formed from groups affected by or interested primarily in zebra mussels. These groups included representatives from municipal governments, industry, water authorities, academic researchers, regulators and New York Sea Grant. With guidance from the ad hoc committee, an initial draft of the management plan was developed. The plan was circulated for review to a larger group of agencies and individuals that were interested in or impacted by nonindigenous aquatic nuisance species. Based on feedback from this review, the focus on zebra mussels was expanded to include all nonindigenous aquatic nuisance species. After further revisions, the plan was submitted for public review.

The management plan is based on the following four goals:

- Reduce the potential for future introductions of nonindigenous aquatic species;
- Reduce the potential for nonindigenous aquatic species that have been introduced to spread into uncolonized waters;
- Minimize harmful economic, ecological and social impacts resulting from nonindigenous aquatic organisms that have already been introduced or are proposed for introduction; and
- Educate the public on the importance of preventing nonindigenous aquatic species introductions, and how the harmful impacts of such species can be reduced or mitigated.

Other sections of the plan that support these goals include research programs, governmental roles and responsibilities, recommendations for implementation and an implementation schedule. The plan describes the appropriate program infrastructure for accomplishing nonindigenous ANS management and specific objectives to be accomplished each year over a three-year period. The overall cost of the program presented is estimated at $350,000. In light of plan approval by the national ANS Task Force, New York's DEC received $68,000 for fiscal year 1995 in federal cost-share support from the U.S. Fish and Wildlife Service for implementation of the plan.

The Status of the Ruffe Control Plan, Thomas Busiahn, U.S. Fish and Wildlife Service, Chair of the Ruffe Control Committee

The ruffe, a spiny-finned fish species of the perch family, is a nonindigenous aquatic nuisance species native to Eurasia that was introduced to North America in the early 1980s presumably

through the ballast water of a seagoing vessel. First collected in 1986, the ruffe has made its home in Duluth Harbor where it has become the most abundant species. The range of the ruffe has expanded rapidly along the southern border of Lake Superior. (Since the date of this workshop presentation, three ruffe were discovered in Thunder Bay of Lake Huron, more than 300 miles east of the previously known range. This new sighting is believed to be the result of ballast water transport.) Exhibiting high reproductive and aggressive behavior for habitat and food, this spiny perch is a serious threat to the fisheries and aquatic ecosystems in the lower Great Lakes and inland waters.

In 1992, a task force appointed by the Great Lakes Fishery Commission recommended a program of research and control regarding the ruffe. The national ANS Task Force appointed a Ruffe Control Committee to develop a Ruffe Control Plan. The plan, based on the goal of preventing or delaying the spread of ruffe beyond western Lake Superior, was completed in June 1995.

The program addresses the vectors by which ruffe are known to spread as reflected in the following recommendations: 1) educational and regulatory actions to prevent bait bucket transport; 2) ballast water management plan, established by the maritime industry with assistance from the Ruffe Control Committee, to reduce the risk that ships might transport the ruffe out of western Lake Superior; 3) elimination of reproducing populations of ruffe on the periphery of its range by using piscicide to prevent unassisted range expansion; 4) research on ruffe populations and their effects on the ecosystem; and 5) evaluation of ruffe biological control measures.

All components of the program are being implemented with the exception of piscicide treatments. If the ruffe escapes from western Lake Superior, the program will be reexamined, and perhaps redirected on ways to keep the ruffe out of inland waters.

Development and Implementation of a Regional Policy on Nonindigenous Aquatic Species for the Chesapeake Basin, Dan Terlizzi, University of Maryland Sea Grant

In December 1993, the Chesapeake Bay Program, a regional body committed to the restoration of the bay, adopted the *Chesapeake Bay Policy for the Introduction of Nonindigenous Aquatic Species.* Major factors stimulating the development of this basinwide policy included the discovery of zebra mussel veligers in the upper Susquehanna River, the major tributary to Chesapeake Bay; the increased use of triploid grass carp in some states of the Chesapeake basin; and the initiation of *in situ* experiments with the nonindigenous oyster *Crassostrea gigas.* This regional policy, developed by the Exotic Species Workgroup of the Chesapeake Bay Programs' Living Resources Subcommittee, serves as guidance to the signatory parties (Maryland, Pennsylvania, Virginia and the District of Columbia) for the management of both intentional and unintentional introductions. Workgroup members include scientists, policy staff and resource managers from the Chesapeake Bay Program jurisdictions, as well as representation from the non-signatory basin states (Delaware, New York and West Virginia).

The management of nonindigenous species in the Chesapeake Bay watershed is pursued on a regional rather than state-by-state or species-by-species basis. The intentional introductions component of the Chesapeake Bay Policy – primarily geared for activities associated with aquaculture, fisheries management, biological controls and research – institutes an interjurisdictional process which guides the signatories in making cooperative decisions regarding the intentional, first-time introduction of nonindigenous aquatic nuisance species.

The policy regarding unintentional introductions covers the following areas: 1) education and information; 2) ballast water discharge; 3) monitoring; and 4) control and eradication methods. The policy recognizes that successful prevention of unintentional introductions is highly dependent on raising awareness of the problem among citizens, government agencies and industry. Considerable attention also is given to ballast water management options since the Chesapeake Bay is at high risk to unintentional introductions via ballast water discharge in the ports of Norfolk, Va. and Baltimore, Md. The Chesapeake Bay Commission, a signatory to the Chesapeake Bay Policy, has led a multidisciplinary Ballast Water Work Group in the production of the document, *The Introduction of Nonindigenous Species To the Chesapeake Bay Via Ballast Water: Strategies to Decrease the Risks of Future Introductions through Ballast Water Management* (Chesapeake Bay Commission, 1995).

Panel 3: Coastal Management Programs in the Great Lakes Region and ANS Issues

Introductory Remarks, Chris Shafer, Michigan Coastal Management Program, Michigan Department of Natural Resources

Catherine Cunningham, land and water management analyst from the Michigan Coastal Management Program will present an overview of Michigan's program. Christine Kasselmann, coastal management administrator from Ohio, will provide a status report on Ohio's coastal management program, which is in the process of development. In addition, ideas will be proposed in both these presentations on how to integrate coastal management programs with ANS program activities. Steve Resler, supervisor of consistency review from the New York Coastal Management Program, was originally on the agenda but was not able to attend the workshop. An overview of New York's program is available in **Appendix G**. Ellen Brody, acting Great Lakes regional manager from NOAA's Office of Ocean and Coastal Resource Management, has taken Resler's place on the agenda and will speak on federal consistency and other coastal management tools that could be used in ANS prevention and control efforts in the Great Lakes region.

Michigan Coastal Management Program, Catherine Cunningham, Michigan Coastal Management Program, Michigan Department of Natural Resources

The Michigan Coastal Management Program (MCMP) encompasses more than 24,000 acres of Great Lakes bottomlands, 600 islands and 3,288 miles of shoreline with coasts that border four of the five Great Lakes. Michigan has had an approved program since 1978 and was among the first states to join the federal Coastal Management Program. Michigan's program, housed in the

Michigan Department of Natural Resources, is designed to provide a regulatory and financial assistance function to protect the state's coastal resources.

MCMP holds direct permitting authority for projects affecting the Great Lakes coast through the following statutes:

- Great Lakes Submerged Lands Act, 1955 PA 247
- Sand Dunes Protection and Management Act, 1976 PA 222 as amended
- Goemaere-Anderson Wetland Protection Act, 1979 PA 203
- Shorelands Protection and Management Act, 1970 PA 245
- Inland Lakes and Streams Act, 1972 PA 346
- Michigan Underwater Salvage Act, 1929 PA 173 as amended

In addition to these core statutes, the MCMP utilizes the Michigan Environmental Protection Act (1970 PA 127), which provides every citizen of the state with standing to bring a cause of action to preserve, protect and enhance the state's natural resources. These statutes need to be assessed in terms of their role supporting Michigan's state management plan for ANS prevention and control.

The federal consistency provisions of the Coastal Zone Management Act, which require all federal permits, licenses and financial assistance loans to be consistent with federally approved state coastal management programs, is another important tool that can be used by MCMP to assist in the implementation of Michigan's state management plan for ANS prevention and control. Federal activities, such as administrative rules pertaining to ballast water discharge would be subject to federal consistency review. Michigan's draft state management plan includes a recommendation for the review of all state statutes related to the possession, transport and control of nonindigenous aquatic nuisance species and identification of those statutes that could be incorporated into MCMP's consistency review process. (Refer to Appendix C and Ellen Brody's presentation for further detail on federal consistency.)

MCMP also holds potential funding opportunities through its federal grants program, that could support projects to address both the objectives of the Coastal Zone Management Act and ANS issues. Examples of grant projects include the development of vehicles that could be used to disseminate ANS information, such as interpretive signs at public access sites, angler guides, exhibits at museums, aquariums and visitor centers. Other examples include coastal research and/or monitoring projects to support ANS prevention and control efforts.

Ohio Coastal Management Program, Christine Kasselmann, Ohio Coastal Management Program, Ohio Department of Natural Resources

Ohio is not yet implementing a coastal management program (CMP) but is receiving federal funds to develop a program. The state is in the process of developing a program document which is expected to be submitted to the National Oceanic and Atmospheric Administration in late summer

1995, with federal approval expected by 1996. Ohio's CMP is defined in state statute as the comprehensive action of the state and its political subdivisions in support of cooperative management of coastal resources and control activities that affect the coastal area and the beneficial use of its resources. The Ohio Department of Natural Resources is the statutorily designated lead agency of a networked program. The state coastal management law also includes a strong state consistency provision that parallels the federal consistency provision.

The recent inclusion of Policy 15 (on) exotic species in the CMP's draft document (yet to be approved) reflects the increased urgency regarding this issue. It addresses regulation of purple loosestrife and exotic fish species, as well as public information efforts and a management plan for state wildlife areas and nature preserves. Although Ohio is not currently implementing a federally approved coastal management program, potential regulatory processes that could incorporate nonindigenous aquatic nuisance species considerations could include submerged lands lease reviews, wetlands water quality certifications, and permitting of water diversion and marinas. As Ohio develops its state comprehensive ANS plan, additional enforceable policies could be deemed necessary. If so, the state's consistency provision could be used to ensure that the state agency actions and permitted activities are consistent with these policies.

Other items under consideration for incorporation in the CMP to support ANS prevention and control are as follows:

- Identification of wetlands, critical fish habitats, and ports and harbors as generic Areas of Particular Concern under CMP for prioritization of funding and actions to protect against ANS ecological threats.
- Use of the National Estuarine Research Reserve at Old Woman Creek as a focal point for state and regional research and information dissemination regarding ANS prevention and control.
- Use of the CMP network (including agency and interagency integrated management teams) to heighten awareness of the need for ANS considerations in the exercise of authorities of various agencies.
- Promotion of cooperative efforts between coastal management programs of the Great Lakes region in light of the fact that ANS problems cross state boundaries.

The Role of Federal Consistency and Other Coastal Zone Management Tools in ANS State Management Plans, Ellen Brody, National Oceanic and Atmospheric Administration, Office of Ocean and Coastal Resource Management

Federal consistency is an environmental law under the Coastal Zone Management Act (CZMA) that allows states to prohibit federal activities or federally authorized activities affecting coastal state resources that are not consistent with the enforceable policies (supported by state law or regulation) of the federally approved state coastal management program (CMP). The CZMA was passed by Congress to assist coastal and Great Lakes states, and U.S. territories to develop state CMPs to comprehensively manage and balance competing uses of and impacts to coastal

resources. The intent of federal consistency is to facilitate consultation and coordination early on in the process.

Federal actions that are subject to federal consistency provisions include:

- Direct federal actions: Activities and development projects performed by a federal agency, or contractor for the benefit of a federal agency. Examples include activities in National Parks, U.S. Corps of Engineers dredging projects, winter navigation in the Great Lakes involving opening and closing of locks by U.S. Corps of Engineers, federally approved Area Contingency Plans for oil spills (Oil Pollution Act), and federally approved state management plans for ANS prevention and control.
- Indirect federal actions: Activities not performed by a federal agency, but requiring federal permits and licenses and other forms of federal approval.
- Federal financial assistance to states, territories and local governments: Examples include Federal Highway Administration funds to state, territorial and local governments; construction grants for wastewater treatment works; and hazardous waste management trust funds.

An example of how federal consistency could be applied to the management of aquatic nuisance species is the review of Interstate Commerce Commission water carrier licenses that could affect the transport of aquatic nuisance species. The federal consistency provision provides the states with an enforceable tool that can be used to protect state coastal resources, including entire ecosystems within the watershed of the coastal zone. It also addresses the need for federal actions to adequately consider the policies of the state coastal management programs. It is an important mandatory, but flexible mechanism to resolve potential conflicts between states, territories and federal agencies, through early consultation, cooperation and coordination.

Note: Several other coastal management tools hold potential in preventing and controlling aquatic nuisance species. The following list of such tools is based on correspondence from Brody following the workshop.

- **Public access projects**: State coastal programs fund numerous public access projects along the coast, including boardwalks and trails, boat ramps, dune walkovers and park improvements. Interpretive displays may be associated with the public access projects. An opportunity exists to encourage states to include, as part of these projects, signs, interpretative displays or other public information related to aquatic nuisance species.

- **Permit conditions**: State agencies place conditions on most permit applications for activities in or affecting the coastal zone. These conditions are required to make the proposed activity consistent with state natural resource laws. Coastal management programs could establish permit conditions to limit the spread of aquatic nuisance species. For example, requirements could be established to ensure that marine operators have sufficient facilities for washing the hulls of boats. Each state's list of enforceable policies should be examined for the development of further ideas.

- **Education and outreach**: Coastal management programs are involved in education and outreach activities in a number of ways that could support ANS management.
  - Newsletters;
  - Coastweeks (a national coastal awareness program, including beach cleanups and many other activities). Coastal management programs could organize Coastweeks activities (e.g., education on ANS issues, boat inspections);
  - Public access projects (see above).

- **Assessment and monitoring of coastal waters**: While coastal management programs typically do not expend significant funds on research and monitoring, states could help to fund baseline studies and monitoring efforts.

- **National Estuarine Research Reserve System**: Section 315 of the Coastal Zone Management Act establishes the National Estuarine Research Reserve System (NERRS). The NERRS is a federal-state cooperative venture designed to protect estuarine land and water resources for use as natural field laboratories; focusing on protection and management through environmental education and interpretation, monitoring and research. Although there is only one such reserve in the Great Lakes region (Old Woman Creek in Ohio), an opportunity exists to conduct research and education activities at that site.

- **Coastal Zone Enhancement Program**: The Coastal Zone Enhancement Program (CZEP) was established in 1990 as part of the CZMA reauthorization. The purpose of the CZEP is for states to assess the condition of their coastal resources and, based on the needs identified, to make changes to the enforceable policies of their coastal zone management programs. One possibility under the CZEP is for states to identify the need to pass a law related to ANS prevention and control. Funds from coastal management programs could then be used to fund the staff work involved in the legislative process, which also can include studies deemed necessary to demonstrate to a state legislature that a problem exists.

- **Implementation and enforcement of ANS plans**: Fund staff from CMPs to develop, implement and enforce the state management plans for ANS prevention and control.

- **Local plans and ordinances**: Use CMP funds to update local comprehensive plans and development of local ordinances. Coastal management programs could work with local communities to revise local ordinances to address ANS management issues.

- **Networking of state agencies**: To gain federal approval of a state program, states are required to demonstrate that mechanisms are in place to coordinate and monitor activities affecting the coastal zone. These mechanisms are often in the form of Memoranda of Understanding or a Governor's Executive Order. Coastal managers are therefore in the position of knowing what activities are underway that could influence the coastal zone.

State coastal programs could use these existing institutional mechanisms (or develop others) to ensure that ANS management is considered in decisions involving state permits and agency actions.

- **National/Regional Policy**: Coastal management programs are well-organized to share information and influence national policy debates. The Coastal States Organization in Washington, D.C., is the lobbying organization and should be apprised of ANS issues. Coastal management program managers should be another voice to promote legislation and funding to support ANS prevention and control. On a different level, the Great Lakes coastal management programs should share information and meet on a regular basis to facilitate regional action on ANS issues.

(For further information refer to the fact sheet, *Federal Consistency Requirements*, found in **Appendix C.)**

Panel 4: A Model To Guide the Development of State Management Plans

Introductory Remarks: Goals of the State Management Plans, Jay Rendall, Minnesota Department of Natural Resources, Chair of the Great Lakes Panel on Aquatic Nuisance Species

In the Great Lakes region, considerable activity is underway concerning the preparation of state management plans. New York has completed a state management plan that has been approved by the national ANS Task Force. The management plan from Minnesota is in draft form, including three species-specific plans that are underway for the Eurasian water milfoil, flowering rush and zebra mussel. Wisconsin has completed two species-specific plans for the Eurasian water milfoil and the zebra mussel; both prepared for the state legislature. Michigan has developed a state management plan in draft form.

The development of the state management plans will first and foremost help guide comprehensive and effective actions in the states on ANS prevention and control, given the many different players working on ANS issues. The Great Lakes Panel on Aquatic Nuisance Species can be instrumental in facilitating regional coordination of the state management plans through the development of a model state management plan for ANS prevention and control. The plan also can serve as a planning tool to assess funding needs for implementation, and could be used in the request for funds.

In reviewing the New York, Minnesota and Wisconsin plans, the following five common goals emerge:

- Prevent the introductions of "new" nonindigenous aquatic nuisance species;
- Contain existing ANS populations;
- Minimize impacts where harmful aquatic nuisance species exist;
- Increase awareness of ANS issues;
- Coordinate management efforts.

These goals have been instrumental in identifying the key strategic actions needed to address prevention and control of aquatic nuisance species. The following discussion provides a brief overview of each of these common goals.

In an attempt to prevent unintentional introductions, the state plans must first identify the pathways of introduction and determine the acceptable prevention methods. Based on these findings, the risks posed by ANS introductions and solutions to the problems caused by these introductions must be communicated to the appropriate groups. To respond to threats from intentional introductions, the state management plans of Minnesota and New York recommend strategies that would prevent the import and release of new species into the states until it can be established that these species are not likely to harm the native plants and animals and the ecosystem where these species would reside. To ensure the review of proposed introductions, legislative action may be required.

To contain existing populations of nonindigenous aquatic nuisance species, the state plans of Minnesota, New York and Wisconsin recommend an outreach program targeting boaters, anglers and the public. The primary intent of the outreach program is to motivate changes in the user groups' practices to limit the spread of aquatic nuisance species. Minnesota promotes the use of regulations in this process, while New York's state plan recommends information/education activities as the approach needed to change the behavior patterns of user groups.

To minimize impacts of aquatic nuisance species, there is general agreement that the states should play a significant role in identifying safe control practices; providing technical, financial and educational assistance; and developing alternative control approaches. The plans also note that not all aquatic nuisance species should be controlled. Minnesota and New York suggest that ANS control needs to be prioritized on the basis of the severity of impacts, directing attention to the most serious problems. Species-specific plans are being developed to address the species causing the most damaging problems.

In the state plans, there was consensus to increase awareness of ANS problems and solutions. Developing consistent messages and determining the appropriate audiences that need to be targeted were identified as important prerequisites to awareness efforts.

To provide coordinated management of aquatic nuisance species, the plans recommend the establishment of a coordinating agency supported by staff that is knowledgeable on ANS issues. Wisconsin and New York both use an outside advisory board to provide feedback on policy and program development. In Minnesota, assistance is provided to the state's Exotic Species Program by an interagency exotic species committee in the dissemination of information, review of policy and programs, and coordination of other ANS related activities.

The following presentations will provide progress reports from the states in the Great Lakes region that are actively working on state management plans.

Progress Reports on the State Management Plans for ANS Prevention and Control in the Great Lakes Region

New York, Tim Sinnott, New York State Department of Environmental Conservation

In August 1991, the New York State Legislature directed New York State's Department of Environmental Conservation to prepare a state management plan for the prevention and control of nonindigenous aquatic nuisance species consistent with the requirements of Section 1204 of the federal *Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990* (P.L. 101-646) *(NANPCA).*

The development of New York's state plan is strongly tied to *NANPCA*, which emphasizes ANS prevention and control. The goals on which the plan is based are required to be measurable and attainable as ascertained by objectives identified under each goal. (Refer to Panel II for Sinnott's presentation on New York's state management plan for details on how the plan was developed and the goals on which it is based.) Education was identified as key to a successful ANS prevention and control program. A mandatory restriction program was not incorporated as part of the plan since effective enforcement is not considered feasible. There also is concern that regulations would harbor ill-will among the user groups. In New York, the cooperation of the public is considered key in achieving the objectives of the plan.

It also is recommended, based on the review process for New York's plan, to send a draft plan to the ANS Task Force for review (where final approval is required) before sending the plan out for public review. The public review responses are included as an addendum to the plan to convey to public reviewers how their comments were addressed.

Approval of New York's state plan by the national ANS Task Force has resulted in $68,000 in federal cost-share support from the U.S. Fish and Wildlife Service. These funds have allowed plan implementation in the following areas: education (production of signs that will be placed at public waterway access sites and brochures for public distribution); monitoring (a pilot project in the Finger Lakes area to document zebra mussel distribution); and research (to monitor contaminant concentration of zebra mussels in various lakes throughout the state).

Michigan, Mark Coscarelli, Michigan Department of Natural Resources, Office of the Great Lakes

When the *Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990* (P.L. 101-646) *(NANPCA)* was first passed in 1990, the Office of Great Lakes was identified as the state agency to coordinate evolving ANS issues. Although there was recognition for ANS problems, energies were focused on other issues believed to be more urgent in the state.

Since that time, however, considerable progress has been made in addressing ANS issues in the state. The document, *Nonindigenous Aquatic Nuisance Species State Management Plan: A*

Strategy to Confront Their Spread in Michigan, was released in early March 1995 by the Office of the Great Lakes and allowed for a 45-day public comment period. Based on the comments received, the plan will be revised and is scheduled for submittal to the national ANS Task Force on June 1, 1995.

The plan is based on the following objectives:

- Reduce the potential for future introductions of nonindigenous aquatic nuisance species into Michigan waters through information, education and dissemination activities; program development; coordination of scientific research; and policy initiatives, including ballast control measures.
- Educate the public, user groups, industry and other affected parties on the importance of preventing nonindigenous aquatic nuisance species transfers and introductions, and how harmful impacts of nonindigenous aquatic nuisance species can be minimized.
- Control and minimize harmful economic, ecological and social impacts resulting from nonindigenous aquatic nuisance species that have already been introduced into the waters of Michigan through education and extension, technical assistance and grant assistance.
- Reduce the potential for nonindigenous aquatic nuisance species that have been introduced into Michigan waters to spread into uncolonized waters through applied research, monitoring and education.

Emphasis has been placed on prevention in Michigan's plan, which is dictated by cost-effectiveness.

The following questions have emerged during the public comment period and internal discussion of the document:

- What is the primary role of the federal government with respect to aquatic nuisance species, an issue that needs to be addressed in the state management plans?
- How can resource management agencies most effectively weigh ANS management program costs against the costs of not having a program?
- How should the issue of cost of prevention versus control be addressed in the plan? How can a balance be established between prevention and control in the plan?
- How should chemical control be addressed in the state management plan? Is integrated pest management a viable option for ANS control strategies?
- Should public access be temporarily restricted on unique water bodies for the short term to prevent the spread of aquatic nuisance species that might pose ecological threats to these waters on a long-term basis?
- To what extent should private sector activities (e.g., aquaculture, bait, horticulture and the pet hobby businesses) be addressed in the plan to provide a proper balance with ballast control issues?
- In taking an ecosystem approach in the ANS planning process, should terrestrial systems be included?

Workshop participants are encouraged to consider these questions in their discussions on the state management plans during the workgroup sessions.

Minnesota, Jay Rendall, Minnesota Department of Natural Resources, Chair of Great Lakes Panel on Aquatic Nuisance Species

The Minnesota Department of Natural Resources (DNR) established a statewide program in 1991 to minimize the spread of ecologically harmful exotic wild animals and aquatic plants and to prevent problems caused by aquatic nuisance species. The legislation, which enables this statewide management coordinating program, allows for a $5 surcharge on watercraft licenses which generates approximately $1 million per year for use in the following areas: control, public awareness, law enforcement, monitoring and research on aquatic nuisance species, such as the zebra mussel, purple loosestrife and Eurasian water milfoil.

The legislation calls for development of a comprehensive ANS state management plan that addresses the coordination of detection, prevention, control and public awareness activities in the state. Prevention and containment are major goals of this comprehensive state management plan, which recommends several strategies and actions to address ANS issues, including public awareness (i.e., billboards, public service announcements, advisory signs, distribution of ANS information kits), watercraft inspections (includes ANS information briefing by inspector), and state regulations (i.e., it is a misdemeanor in Minnesota to transport zebra mussels and several other aquatic nuisance species on a public road or to launch a boat with ANS attachments). Minnesota DNR also has found it beneficial to develop species-specific management plans for aquatic nuisance species identified as high priority. Thus far, species-specific plans have been completed for the Eurasian water milfoil and the flowering rush, and drafted for the zebra mussel and purple loosestrife.

Wisconsin, Ron Martin, Wisconsin Department of Natural Resources

Although Wisconsin has not yet initiated the development of its state implementation plan, the state has prepared species-specific management plans on the Eurasian water milfoil and zebra mussels. These species-specific plans, which were prepared at the direction of the state legislature, the governor and the Wisconsin Department of Natural Resources (DNR), will serve as addenda to the State Implementation Plan when it is completed. The DNR is also in the process of drafting an inland response plan for the ruffe, which should be completed later in the year.

In addition, the DNR has developed a draft policy that will guide agency action on nonindigenous terrestrial and aquatic species. The policy, to be finalized later in 1995, will provide the framework for the development of the State Implementation Plan. This plan will focus only on unintentional introductions of nonindigenous aquatic nuisance species. The DNR, serving as the responsible agency for plan development, is committed to drafting an ANS plan that is compatible with the other states in the Great Lakes region and promotes strong partnerships with other jurisdictions in implementation.

A Model Comprehensive State Management Plan for the Prevention and Control of Nonindigenous Aquatic Nuisance Species **(Draft)**, Katherine Glassner-Shwayder, Great Lakes Commission

The comprehensive state management plans for the prevention and control of nonindigenous aquatic nuisance species are called for in Section 1204 of the *Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990* (P.L. 101-646) *(NANPCA)*. Section 1204 requires that the management plan "identifies those areas or activities within the state, other than those related to public facilities, for which technical and financial assistance is needed to eliminate or reduce the environmental, public health, and safety risks associated with aquatic nuisance species." Each state plan should focus on the identification of management practices and measures to be taken on by state and local programs to prevent and control ANS infestations in a manner that is environmentally sound. Section 1204 also states the need for coordination among local, state and federal government agencies in implementation of the plan. It is recommended that in the development and implementation of the plan, the lead state agency involve local governments and regional entities, and public and private organizations that have expertise in the control of aquatic nuisance species. The state management plans are to be submitted to the national ANS Task Force for approval. If the plan meets the requirements of the ANS Task Force, it becomes eligible for federal cost-share support. If not, the plan is returned to the state with recommended modifications. Plans may be implemented with other funds supplied by state and cooperative agencies. Further details on the state management plans can be found in Section 1204 of *NANPCA* (refer to **Appendix B**).

The purpose of the model comprehensive state management plans is to provide guidance to Great Lakes state agencies for the development and implementation of respective state management plans for ANS prevention and control. The draft model presented here today, based on staff research and discussions with state resource managers in the Great Lakes region, is only a starting point in its construction. The model will be critiqued and further developed during the upcoming workgroup sessions.

The draft model is based on the following goals:

- Goal I: The prevention of future introductions of aquatic nuisance species into waters of the state;
- Goal II: The prevention of the spread of aquatic nuisance species that have already been introduced into uninfested waters of the state;
- Goal III: The abatement of harmful economic, ecological and social impacts resulting from aquatic nuisance species that have already infested state waters;
- Goal IV: The education of the public, user groups, natural resource agencies, industry and business, policymakers and other affected parties on the importance of the prevention and control of aquatic nuisance species; and
- Goal V: Coordination among federal, state and local agencies involved in the prevention and control of aquatic nuisance species.

Based on these goals, the following hierarchy is recommended to help define primary ANS prevention and control management activities: a goal statement, problem definition, and recommended strategies and activities needed to accomplish stated goals. The first portion of Goal II is presented as an example to illustrate the model hierarchy.

Goal II: The prevention of the spread of aquatic nuisance species that have already been introduced into uninfested waters of the state.

Problem: Aquatic nuisance species spread into uninfested state waters. Most pathways are the result of human activity, such as boat transfers, ballast exchange, bait and tackle activities, water transport, and ornamental and landscape endeavors. Limiting the spread of such populations is problematic due to both the numerous pathways of dispersal, the complex ecological characteristics associated with ANS populations and the lack of feasible technology that is needed to limit the spread. As a result, the affected community is unprepared to deal with the infestation and associated ecological, economic and social impacts.

Strategy A: Identify the aquatic nuisance species that are causing harmful ecological and economic impacts and monitor their distribution in state waters.

> Activity 1: Develop criteria that help determine which aquatic nuisance species are to be considered ecologically and economically harmful.
>
> Activity 2: Establish a network of governmental, public and private groups that will assist in monitoring those species determined to be most harmful.

In addition to the preceding hierarchy of goals, problems, strategies and activities, it is recommended that the state management plans include the following components:

1) Executive Summary
2) Introduction
3) Background Information
3) Implementation Schedule of Annual Objectives (required by Section 1204 of the ANS Act)
4) Budget Information
5) Funding Sources (including federal, state, local and nongovernmental opportunities)

During workgroup sessions, participants will be asked to assess the goals and hierarchy of the model management plan, and also elaborate on the problems and related strategies and activities. Efforts should be made in the workgroup sessions to reach agreement on the higher layers of the model to advance a regional framework for its development and implementation. The expertise from federal, state and local agencies represented at this workshop will be critical to the completion of this model in a form that maximizes its usefulness to the states.

Workgroup Sessions

An Overview of Workgroup Sessions and Assigned Tasks, Katherine Glassner-Shwayder, Great Lakes Commission

Workgroup sessions met concurrently during morning and afternoon sessions of the second day of the workshop (May 3). Workshop participants were assigned to one of four workgroups (refer to **Appendix H** for listing of workgroups), and each group was given the tasks indicated below. Each of these groups was led by designated facilitators, supported by volunteer recorders and reporters. The findings of each workgroup were presented by each of the group reporters during a plenary session at the end of the workshop.

The workgroups were each asked to focus on further development of the draft comprehensive state management plan (presented in these proceedings on pages 29-32) that as a final document will be used as guidance for the Great Lakes states in developing state management plans, as called for in Section 1204 of the *Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990* (P.L. 101-646) *(NANPCA)*. The workgroups also were asked to generate ideas on how tools from coastal management programs (CMPs) could be used in the implementation of the state management plans; and how consideration of ANS issues could be strengthened in coastal management programs of the Great Lakes region. To address these issues, the following questions were posed during the workgroup sessions:

Morning Meeting of Workgroup Sessions:

- What are the strengths and weaknesses of the proposed model?
- How might it be modified for the prevention and control of aquatic nuisance species?
- What are some problems and related strategies that could be used to expand the model under each goal?

Afternoon Meeting of Workgroup Sessions:

- What resources are presently available to address ANS issues?
- What tools (i.e., regulations, statutes, enforceable policies) are available from coastal management plans to implement the state management plans?
- What other authorities or tools in the ANS state management plans could be supported by the coastal management plans to facilitate plan implementation?

The information gathered during these workgroup sessions is presented in summary form below. The workgroup findings have also been integrated as part of the final version of *A Model Comprehensive State Management Plan for the Prevention and Control of Nonindigenous Aquatic Nuisance Species* found in **Appendix A** of these proceedings.

Summary of Workgroup Findings

Blue Group: Facilitated by Michael J. Donahue, Great Lakes Commission

Considerable discussion took place regarding problems associated with Goal I (prevention of future ANS introductions). Meeting such a goal will require addressing the following: multiple and unknown transport mechanisms responsible for ANS introductions; multiple authorities responsible for ANS management; an absence of statewide policy on ANS issues; many ANS vectors that lie outside the control of the state; a lack of technology to control ANS spread; and a crisis response mentality that limits focus on future introductions, thus impeding the opportunity for the prevention of future ANS introductions. It was recommended to address these problematic conditions in the model plan under Goal I.

The group recommended that, for Goal II (prevention of ANS spread), a more positive spin should be given to facilitate a productive problem-solving approach. It also was noted that geographic factors may facilitate ANS movement through natural and anthropogenic pathways.

Under Goal III (abating harmful ANS impacts) it was suggested that the word "minimize" should be used instead of "abatement." The group identified the need to determine financial and ecosystem costs to achieve Goal III, acknowledging that the assessment of natural resource damage is often difficult and ambiguous. Uncertainties associated with prevention and control technology also were noted as problematic. The group identified the need to prioritize the allocation of resources for ANS prevention and control problems.

Other recommendations/issues offered by the group include:

- Goal IV (education on ANS prevention and control) and Goal V (regional coordination of agencies working on ANS issues) should be included in the state management plans as strategies, not goals.
- Explicit definition of terms is needed, using the definitions given in *NANPCA* where appropriate.
- Additional language is needed to integrate the interstate management plans into a larger ecosystem plan with Great Lakes-St. Lawrence Basin.
- Consistency and coordination with Canada need to recognized in the model plan.
- Acknowledgment is needed in the model plan that state distinctions are appropriate and necessary in the state management plans.
- The model management plan needs to define the role of federal entities.
- The implementation strategies of the management plans need to be specified at all levels of government (federal, state, local).
- An evaluation component to the model plan is needed.
- Plan costs should be included in the state management plans where possible.
- The plans should identify statutes and programs at the state/federal level supporting plan goals.

- Opportunities to apply existing coastal program authorities to plan implementation should be fully explored.
- The plans should emphasize integrating recommended ANS activities with other existing programs.

Orange Group: Facilitated by Katherine Glassner-Shwayder, Great Lakes Commission

The group offered the following recommendations for modifying the model:

- Use only the first three goals (prevention of future ANS introductions, prevention of ANS spread, abatement of harmful ANS impacts) as listed in the draft model. Goals IV (education on ANS prevention and control) and Goal V (coordination of agencies working on ANS issues) as listed in the draft model are not truly goals, only supporting mechanisms to achieve the goals.
- To achieve the goals for the model, the strategies should include the following elements: partnerships, research, education and regulation.
- Elements that should be considered in defining the problem statements of the model are: knowledge, funding, technology and authorization.
- Education needs to be stressed in the management plan with the following objectives:
  - inform the public on impacts;
  - provide the different audiences with consistent information; and
  - base advisories/education on sound research.
- The role of the federal government needs to be identified under each goal.

A noted strength of the model is its systematic approach to capturing the quintessential points needed in a comprehensive state management plan: a hierarchy with goals that prompt one to ask difficult questions.

The group recommended the following tools from CMPs that would help in the implementation of the state management plans:

- Funding opportunities for ANS projects may be available through CMP grants;
- Use of federal consistency under the Coastal Zone Management Act as a tool to oversee federal action affecting ANS problems in the states;
- The interagency approach of CMPs provides a coordinative function applicable for ANS programs;
- Advocacy initiatives, including legislative studies, can be conducted through CMPs;
- Permit conditions on projects can be established through CMPs;
- Interpretive/education displays at recreation areas/facilities can be accomplished through CMPs;
- Use Coastweek as an initiative to facilitate ANS activities such as volunteer training and boat inspections;
- CMPs can provide funding for assessment and monitoring programs.

Yellow Group: Facilitated by Jay Rendall, Minnesota Department of Natural Resources, Chair of the Great Lakes Panel on Aquatic Nuisance Species

The group cited the strengths of the model as being proactive; offering a strong focus on public education; recommending strategies involving appropriate user groups; and promoting regional coordination.

The weaknesses identified included the lack of indicators to measure success and accomplishments of strategies and tasks; the need for species-specific plans as found in management efforts of Minnesota and Wisconsin; and the need for more specific language for activities and implementation efforts.

For Goal I (prevention of new ANS introductions), recommendations were made to address intentional and unintentional introductions by establishing a process to review regulations and laws that have interjurisdictional implications (e.g., aquaculture regulations), and to promote federal research and development efforts, particularly with regard to ballast technology.

Under Goal II (prevention of the spread of existing problem species), it was noted that, in some cases, controlling the spread of species is highly improbable. Consequently, efforts should be focused on minimizing ANS spread where it is technically and economically feasible. Recommended strategies to minimize ANS spread include: 1) determine pathways through which they are spreading; 2) interrupt pathways though voluntary and regulatory approaches; 3) encourage research and development on ballast technology; and 4) pursue education/information programs for prevention and containment.

For Goal III (abatement of harmful ANS impacts), the group recommended implementation of integrated pest management for each species identified for control. Other recommendations include: prioritizing problem species using a matrix to determine which species warrant control; developing adaptive strategies that guide communities on how to live with ANS problems; and providing technical advice on how to address ANS problems.

It was noted that an interjurisdictional mechanism was needed to resolve differences between state, federal, tribal and local entities in achieving enforceable polices with consistent objectives.

The following resources were suggested to address ANS issues:

- **Expertise**: Sea Grant, National Biological Service, federal research and development programs, university programs, resource management agencies, Great Lakes Panel on Aquatic Nuisance Species, Great Lakes Commission, Great Lakes Fishery Commission, Canadian federal and provincial agencies, International Joint Commission, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, Lake Carriers' Association, private consultants, sport fishing groups, municipalities and private industries, tribal entities.

- **Funding**: State coastal management programs (CMPs), Sea Grant programs (National Oceanic and Atmospheric Administration), state appropriations as designated funds, Great Lakes Protection Fund, Great Lakes Fishery Commission, foundations that fund environmental projects, private industry organizations and tribal governments.

The group recommended the following tools that could be derived from state CMPs to support ANS prevention and control: aquaculture laws and regulations, administrative rules, diversion laws and regulations, National Pollution Discharge Elimination System (NPDES) permits, Coast Guard regulated discharges, ballast, waste disposal practices, dredge and fill operations via permit review of the U.S. Corps of Engineers operations, marine pollution control law, commercial fishing laws and regulations, licensing, bait and tackle laws and regulations, and other state environmental protection policies.

Also discussed was the role of CMPs in implementation of ANS state management plans. Recommendations include:

- Funding opportunities in areas of outreach, research for prevention and control efforts, monitoring activities, educational displays, angler guides, shipwreck conservation, monitoring program documents, boat washing facilities;
- Use of federal consistency; and
- State coordination on ANS problems among agencies addressing coastal issues.

Red Group: Facilitated by Chris Shafer, Michigan Coastal Management Program, Michigan Department of Natural Resources; and Lori Reynolds, Great Lakes Commission

The group recognized the model as a useful generic tool to address ANS issues. The group also noted that the model hierarchy, problem statements and plan components were sound, providing the direction needed to identify and implement strategic actions for ANS prevention and control.

Although the first three goals (prevention of future ANS introductions, prevention of ANS spread, abatement of harmful ANS impacts) were accepted by the group, the last two goals (education on ANS prevention and control, coordination of agencies working on ANS issues) were considered questionable since education and coordination were viewed as strategies that were essential in achieving the aforementioned goals. The group recommended a stronger presentation of the requirements of Section 1204 of *NANPCA* in the model to ensure consistency with the act. The inclusion in the model plan of an evaluation tool to serve as a feedback mechanism was recommended to help monitor accomplishments of the state management plans. Other modifications suggested to strengthen the model plan include additional appendices for species-specific plans, a public dissemination component, and an implementation schedule under each goal to present project timelines, budget and lead agencies. The group also identified the need to evaluate existing state and federal laws for consistency to determine if new laws and regulations may be needed.

Under Goal I (prevention of future ANS introductions), risk assessment was called for to identify high risk species and vectors. Regional consistency was identified as an essential tool to facilitate cooperation between the states and the federal government regarding ANS prevention efforts. The group noted the importance of convincing the public that the prevention of ANS introductions is a worthwhile investment of resources. There also was discussion on the problem of integrating intentional and unintentional introductions under Goal I.

Modification of Goal III (abatement of harmful ANS impacts) was recommended to include public health impacts as well as ecological, economic and social impacts. It was suggested to prioritize the impacts by categories, (e.g., ecological, economic, social, public health) to help formulate effective strategic actions. A significant problem discussed by the group was the lack of options to abate/mitigate impacts due to the lack of knowledge and technology.

The group identified the need to take advantage of the following resources currently available to address ANS issues: Sea Grant and university research/outreach programs, funding opportunities of private foundations, volunteer/nonprofit groups, lake associations, watershed councils, professional groups (i.e., American Fisheries Society), trade organizations (power companies, marine architecture groups), private industry, Canadian federal and provincial agencies, U.S. Fish and Wildlife Service, U.S. Coast Guard, National Oceanic Atmospheric Administration (NOAA), and the U.S. Army Corps of Engineers.

Funding opportunities identified by the group include: license revenue, gas tax, coastal management and Sea Grant programs (NOAA), ANS grants appropriated through *NANPCA*, Great Lakes Protection Fund, state appropriations, fishery funds, Great Lakes Fishery Commission, shipping industry, tribal governments, celebrities and citizens in general.

The tools available from CMPs include: state enforceable policies on water quantity and water quality issues, environmental protection laws (e.g., MEPA, NEPA), civil and criminal codes, aquaculture laws and regulations, administrative rules (changes to existing statutes), discharge permits, U.S. Coast Guard regulations related to ballast exchange and waste disposal, dredge and fill permits, NPDES permit review, public boat access laws, bait taking laws, commercial fishing laws, federal/state consistency, public trust policy regarding submerged lands, water quality certification under Sections 404 of the Clean Water Act, state endangered species laws, agricultural product inspection, marina regulations (with the addition of boat cleaning stations and other procedures needed for ANS prevention and control), boating safety program (providing an opportunity for outreach activities) and nature centers (for outreach activities).

Other tools suggested to support ANS prevention and control activities include: manufacture of installed placards (e.g., drain live-well before leaving water to prevent ANS transfers), Lakewide Management Plans and Remedial Action Plans, and coordination of existing programs at local, state, federal and regional levels (i.e., Great Lakes Commission, International Joint Commission, Great Lakes Fishery Commission).

The group noted that the ANS/CMP workshop was a good example of how regional coordination can strengthen ANS prevention and control efforts.

Workshop Summary

Where Do We Go From Here? Recommendations on a Regional Strategy for ANS Prevention and Control in the Great Lakes Basin, Michael J. Donahue, Great Lakes Commission

The following recommendations are based on general findings from the workshop, particularly the key points presented in reports from the workgroup sessions:

- The problems caused by aquatic nuisance species raise interjurisdictional challenges for effective ANS prevention and control. Therefore, the *Model Comprehensive State Management Plan for the Prevention and Control of Nonindigenous Aquatic Nuisance Species* needs to facilitate regional partnerships among federal, state and local agencies and non-governmental groups.

- The following goals should serve as the foundation for the final version of the model state management plan:

  Goal I: Prevention of future ANS introductions
  Goal II: Limiting the dispersal of aquatic nuisance species already established in the Great Lakes; and
  Goal III: Abatement of harmful ANS impacts

- The goals presented in the draft model management plan regarding education on ANS prevention/ control and coordination of agencies working on ANS issues are generally not considered goals. Rather, they are regarded as mechanisms to achieve the accepted goals as listed above. Integrating education and coordination efforts in strategic actions is strongly advised.

- There is general acceptance of the basic structure/hierarchy of the draft model plan. To strengthen the model, additional components should be added that address evaluation, public dissemination and implementation schedules, including tasks and timelines.

- To promote the multijurisdictional, ecosystemic aspect of the plan, implementation should be focused on statewide and regional action rather than depending solely on the agency that developed the plan.

- The model plan needs to promote consistency between the Great Lakes states. In so doing, consistency should not be forced upon the states. Varied approaches may need to be taken by each of the states. A consistent approach will be encouraged wherever possible.

- A strong link exists between ANS issues and coastal management programs (CMPs). Some of the tools recommended from CMPs to strengthen ANS prevention and control

efforts (i.e., implementation of the state management plans), include federal consistency, permit conditions, education and outreach programs, networking of state agencies, funding opportunities through grants under the Coastal Zone Management Act, and the promotion of legislation and policy supporting ANS prevention and control through CMPs.

- Based on the outcome of this workshop, the model plan will be regionally supported by the appropriate parties, and provide a pragmatic, regional framework for the development and implementation of the state management plans.

- The development and implementation of state management plans is a priority. The *Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990* (P.L. 101-646) (*NANPCA*) is up for reauthorization, and should thus serve as incentive for moving plan development along quickly. The more Great Lakes state management plans that are submitted and approved, the more likely members of the congressional delegation from those states will be to support reauthorization of *NANPCA* and appropriations for plan implementation. This is a window of opportunity to both help the reauthorization effort and position the Great Lakes states for funding opportunities.

In summary, the workshop provided a wealth of information to expand and refine the model state management plan that will serve as guidance for the Great Lakes states in the development of their management plans for ANS prevention and control. After the model plan has been modified by Great Lakes Commission staff, it will be distributed for review by workshop participants and members of the Great Lakes Panel and national ANS Task Force. Interim drafts of the model will be available for use by the Great Lakes states to help in moving forward on the development of their management plans. The model plan will be finalized based on this review.

To document the workshop, proceedings will be prepared by Great Lakes Commission staff, including summaries of presentations, discussions and results from the workgroup sessions. The proceedings will serve as a resource on ANS issues and also provide support for use of the model plan.

V. DISTRIBUTION STRATEGY FOR THE WORKSHOP PROCEEDINGS

This document, which includes the workshop proceedings and the final version of *A Model State Management Plan for the Prevention and Control of Nonindigenous Aquatic Nuisance Species,* will be distributed to workshop participants/invitees and members of the Great Lakes Panel and the national Aquatic Nuisance Species Task Force. Selective distribution to others with a responsibility for, or interest in the ANS issues and/or the state management plans will be pursued. Copies will be available from the Great Lakes Commission.

APPENDIX A

A Model Comprehensive State Management Plan for the Prevention and Control of Nonindigenous Aquatic Nuisance Species

A MODEL COMPREHENSIVE STATE MANAGEMENT PLAN FOR THE PREVENTION AND CONTROL OF NONINDIGENOUS AQUATIC NUISANCE SPECIES

REPORT TO THE GREAT LAKES STATES

(Approved by the Great Lakes Panel on Aquatic Nuisance Species)

January 1996

By:
Katherine Glassner-Shwayder
Environmental Quality and Resource Management Program
Great Lakes Commission
400 Fourth Street
Ann Arbor, Michigan 48103-4816

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PREFACE

This report is presented to the Great Lakes states as guidance in developing comprehensive state management plans under Section 1204 of the federal *Nonindigenous Aquatic Nuisance Prevention and Control Act* (P.L. 101-646) (*NANPCA*). Although prepared specifically for the Great Lakes states, this model plan also has application for other states and Canadian provinces.

This report is based on the findings of a regional workshop (May 1995) titled *Aquatic Nuisance Species/Coastal Management Programs: Toward a Regional Strategy in the Great Lakes Basin.* That workshop, as well as this report and an associated proceedings document, were made possible by a grant from the National Oceanic and Atmospheric Administration to the Michigan Department of Natural Resources under Section 308 of the Coastal Zone Management Act.

This report was prepared by the staff of the Great Lakes Commission's Resource Management and Environmental Quality Program: Katherine Glassner-Shwayder (principal author), Thomas Crane and Lori Reynolds. Members of the Great Lakes Panel on Aquatic Nuisance Species, particularly the chair, Jay Rendall, Minnesota Department of Natural Resources, provided guidance, review and technical assistance. Their contributions, as well as those of state coastal managers and all other workshop attendees, were critical to the success of the project.

Questions and comments on this report can be directed to the Great Lakes Commission at: The Argus II Building, 400 Fourth Street, Ann Arbor, MI 48103-4816; phone: 313-665-9135; fax: 313-665-4370; e-mail: glc@great-lakes.net.

Michael J. Donahue, Ph.D.
Executive Director

A MODEL COMPREHENSIVE STATE MANAGEMENT PLAN FOR THE PREVENTION AND CONTROL OF NONINDIGENOUS AQUATIC NUISANCE SPECIES

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Section 1204 of *Nonindigenous Aquatic Nuisance Prevention and Control Act* of 1990
List of members of relevant task forces/committees
State laws and regulations
Information/Education Strategy for Aquatic Nuisance Prevention and Control, prepared by the Information/Education Subcommittee, Great Lakes Panel on Aquatic Nuisance Species
Other relevant management plans
Reference Materials
Emergency contacts
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III. **ATTACHMENT 1:** *Information/Education Strategy for Aquatic Nuisance Prevention and Control,* Prepared by the Information/Education Subcommittee of the Great Lakes Panel on Aquatic Nuisance Species

I. HOW TO USE THIS MODEL

This document is a model to guide Great Lakes states in the development of state comprehensive management plans for the prevention and control of nonindigenous aquatic nuisance species as called for in the federal *Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990* (Public Law 101-646) *(NANPCA)*. (Note that in this document, reference to aquatic nuisance species will imply that the species is nonindigenous.) It is recommended that each state's plan include the following eight sections: 1) executive summary; 2) nonindigenous aquatic nuisance species (ANS) background; 3) policy background; 4) management actions; 5) implementation; 6) program monitoring and evaluation; 7) glossary; and 8) appendices.

The executive summary should include a brief overview of the state management plan, including a statement of purpose for the plan. The nonindigenous ANS background should provide a brief history of the invasion of aquatic nuisance species in the Great Lakes region, including a state-specific historical perspective. It should feature species that have caused significant ecological and/or socio-economic impacts in the region/state to illustrate the need for prevention and control of aquatic nuisance species. The policy background should present a brief overview of *NANPCA*, as well as any relevant state-specific legislation/policies. The management actions section should outline the goals, problems, strategic actions and tasks that are designed to guide the state in addressing ANS problems. Reference to the *Information/Education Strategy for Aquatic Nuisance Prevention and Control* (prepared by the Information/Education Subcommittee of the Great Lakes Panel on Aquatic Nuisance Species) is recommended, when applicable, to assist in developing strategic actions and tasks for the state management plan (refer to **Attachment 1)**. The implementation section should contain task-specific details on lead and cooperating agencies, budget and sources of funds, and timelines. The program monitoring and evaluation section should explain how the state will monitor/evaluate implementation progress and initiate adjustments, as needed. The glossary should provide definitions of terms that are consistent with those presented in *NANPCA*. The appendices should include supporting documentation for the management plan.

To help ensure success in using this model as guidance in shaping individual state management plans, the states are encouraged to involve responsible agencies and interested stakeholders in the planning and implementation process. These groups should include, among others, federal, state, and local governmental agencies, scientists, local and state decisionmakers, recreational user groups, industry and business representatives, environmental/conservation groups and citizens. A public review process of the state management plan will be required for eligibility for federal approval and supporting grants.

It is important to note that the following model is offered as guidance to the states to assist in the development of their management plans, and to facilitate a certain level of regional direction and coordination regarding the state management plans of the Great Lakes region. This model, however, should be considered a flexible tool that can be modified to most effectively address the needs and interests of the individual states. In developing a state management plan, efforts should be taken to ensure that it is consistent with the planning, management and policy initiatives of the other Great Lakes states working on the plans.

II. RECOMMENDED COMPONENTS OF A STATE MANAGEMENT PLAN

1) EXECUTIVE SUMMARY

(Note: The executive summary should provide a brief synopsis of each section of the state management plan. The executive summary also should include a general statement on the purpose of the state management plan as articulated in NANPCA. The statement of purpose should be augmented with a state-specific perspective. Also recommended for inclusion is an overview of the goals on which the plan is based.)

The purpose of the comprehensive state management plan is to provide guidance on management actions to address the prevention, control and impacts of nonindigenous aquatic nuisance species that have invaded or may invade the Great Lakes and inland waters of the state. The development of a state management plan, as called for in Section 1204 of the *Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990* (P.L. 101-646) *(NANPCA)* provides an opportunity for federal cost-share support for implementation of the plan. Approval of the management plan by the national Aquatic Nuisance Species (ANS) Task Force is also required for a state to be eligible for federal cost-share support.

Section 1204 requires that the management plan "identifies those areas or activities within the state, other than those related to public facilities, for which technical and financial assistance is needed to eliminate or reduce the environmental, public health and safety risks associated with aquatic nuisance species." The content of each state plan is to focus on the identification of feasible, cost-effective management practices and measures to be taken on by state and local programs to prevent and control ANS infestations in a manner that is environmentally sound.

The goals of this model state management plan are designed to address different stages of ANS invasion: 1) the introduction of nonindigenous species transported from water bodies from other parts of the continent or world; 2) the spread of an established, reproducing ANS population to other water bodies and 3) the colonization of ANS populations within water bodies, including the harmful impacts resulting from colonization.

The three goals on which the model state management plan is based are as follows:

- Goal I: Preventing new introductions of nonindigenous aquatic nuisance species into the Great Lakes and inland waters of the state.
- Goal II: Limiting the spread of established populations of nonindigenous aquatic nuisance species into uninfested waters of the state.
- Goal III: Abating harmful ecological, economic, social and public health impacts resulting from infestation of nonindigenous aquatic nuisance species.

2) NONINDIGENOUS AQUATIC NUISANCE SPECIES BACKGROUND

(Note: The following text is suggested information for use in the introduction of each state's management plan. Each state should use this material, as appropriate, and add additional state-specific information, as available.)

The introduction of nonindigenous aquatic nuisance species into the Great Lakes and inland state waters is a source of biological pollution that threatens not only the ecology of the region and states' water resources, but also the economic, societal and public health conditions of the region and states. The Great Lakes and connecting channels and rivers form the largest surface freshwater system in the world. The water resources of the Great Lakes region are an integral part of activities such as recreation and tourism valued at $15 billion annually, $6.89 billion of which is related to the fishing industry. Approximately 75,000 jobs are supported by sport fisheries; and commercial fisheries provide an additional 9,000 jobs (U.S. Fish and Wildlife Service, 1995).

The Great Lakes region has been subject to the invasion of aquatic nuisance species since the settlement of the region by Europeans. Since the 1800s, at least 139 nonindigenous aquatic organisms have colonized habitats of the Great Lakes ecosystem. The bulk of these species include: plants (59), fish (25), algae (24), mollusks (14) and oligochaetes (7). About 55 percent of these species are native to Eurasia; 13 percent are native to the Atlantic Coast. Although the obvious impacts of some of the most abundant species are being determined, most of the aquatic nuisance species and their direct and indirect impacts are not known.

As use of the Great Lakes intensified as a transportation route for commerce, the rate of introduction of aquatic nuisance species also increased. More than one-third of the organisms have been introduced in the past 30 years, a surge coinciding with the opening of the St. Lawrence Seaway. Other human activities contributing to the transport and dispersal of aquatic nuisance species in the Great Lakes and inland state waters include release of organisms from the ballast water of ships, transport and release from the bottom of ships, movement or intentional release of aquaculture and fishery species along with their associated (free-living and parasitic) organisms, release of organisms associated with pet industries or pest management practices, recreational boating, bait handling, water transport, and ornamental and landscape practices.

A newly introduced species, if it becomes established through reproduction, can disrupt the natural ecosystem balance by altering the composition, density and interactions of native species. This disruption can cause significant changes to the ecosystem, such as alterations to the foodwebs, nutrient dynamics and biodiversity. New introductions also can cause costly socio-economic impacts even if effective prevention and control mechanisms are established. Eventually, each newly introduced species will become integrated into an ecosystem that is in a constant state of flux; or the population will not survive and become extinct (New York State Department of Environmental Conservation, 1993).

Approximately 10 percent of the Great Lakes' nonindigenous aquatic species have resulted in significant negative ecological and economic impacts. The following examples portray the extensive ecological and economic impacts caused by aquatic nuisance species that have been introduced into the Great Lakes region.

The invasion of the sea lamprey in the 1940s has resulted in substantial economic losses to recreational and commercial fisheries, and has required annual expenditures of millions of dollars to finance control programs. During the 1940s and 1950s, the sea lamprey, a top predator which kills fish by attaching to its prey and feeding on body fluids, devastated populations of whitefish and lake trout. The predation of the sea lamprey on this valuable commercial fishery permitted populations of commercially less valuable fish to proliferate. In 1992, annual sea lamprey control costs and research to reduce its predation were approximated at $10 million annually. The total value of the lost fishing opportunities plus indirect economic impacts could exceed $500 million annually (Office of Technology Assessment, 1993).

The nonindigenous populations of alewife increased rapidly in the Great Lakes during the 1940s and 1950's because of the suitability of the habitat and the fact that predators were not sufficiently abundant to check their growth. Consequently, periodic die-offs fouled recreational beaches and blocked municipal and industrial water intakes. While the alewife out-competed and suppressed whitefish, yellow perch, emerald shiners and rainbow smelt, it subsequently became a fish preyed upon by introduced trout and salmon. The alewife has permanently altered the existing predator-prey relationships in the Great Lakes ecosystem.

The ruffe, a Eurasian fish of the perch family, was introduced to North America in the 1980s, most likely through the ballast water of a seagoing vessel. This aquatic nuisance species has few predators, no commercial or recreational value and is replacing valuable native fishes. Since its introduction, the ruffe has become established in the nearshore waters of western Lake Superior, with an estimated average rate of range expansion of 18 shoreline miles per year. By the fall of 1994, ruffe populations were found in Michigan waters of Lake Superior and in August of 1995, three ruffe were discovered in a commercial harbor in northern Lake Huron, more than 300 miles east of the previously known range. The ruffe has become the most abundant species in Duluth Harbor. Based on observations of present ruffe migration rates along with native fish population displacements in Lake Superior, as well as past experience of ruffe in European waters, it appears that ruffe will be in direct competition with yellow perch and whitefish populations. Walleye populations are affected indirectly through a change in the food chain composition brought on by the proliferation of the ruffe. Based on moderate estimates of expected declines of yellow perch, whitefish and walleye, the annual economic loss to the U.S. sport and commercial fisheries is estimated at approximately $119 million if the ruffe suddenly proliferates to all lake regions (Leigh, 1994).

The round goby and the tubenose goby were introduced via ballast water into the St. Clair River, near Detroit in 1990. The tubenose goby has not thrived, but the round goby has spread into Lake Erie and Lake Michigan where the largest population is found. The round goby was

observed in the St. Louis River Estuary in Lake Superior during the summer of 1995. The primary concern with the round goby is the tremendous range expansion exhibited since its introduction in 1990. It is a very aggressive fish, and feeds voraciously upon bottom-feeding fishes (e.g., sculpin, darters and logperch), snails, mussels and aquatic insects. The Great Lakes fisheries, particularly those in Lake Michigan and Lake Erie, are threatened by this aquatic nuisance species due to its robust characteristics and ability to displace native species from prime habitat and spawning areas.

The spiny water flea, a likely ballast water introduction, is a tiny crustacean with a sharply barbed tail spine. The northern Europe native was first found in Lake Huron in 1984. The spiny water flea is now found throughout the Great Lakes and in some inland lakes. Although researchers do not know what effect the invader will have on the ecosystem, resource managers suspect that the water flea competes directly for food with small fish such as perch.

The zebra mussel, another ballast water introduction, is one of the best known invaders of the Great Lakes region and other areas of the country where it has spread. This aquatic nuisance species has caused serious economic and ecosystem impacts. The zebra mussel, a highly opportunistic mollusk, reproduces rapidly and consumes microscopic aquatic plants and animals from the water column in large quantities. The potential impact on the fishery can be profound due to changes in food availability and spawning areas, to name a few. Economic impacts are as pervasive as the ecosystem impacts. Great Lakes municipalities, utilities and industries due to the infestation of zebra mussel in their intake/discharge pipes – have significant costs associated with monitoring, cleaning and controlling infestations. According to a recent economic impact study, each of 84 Great Lakes water users reported average total expenditures of $513,600 over the five-year period from 1989 to 1994 (Hushak et al., 1995). By the end of this century, water users across the country are expected to spend between $2 billion and $3 billion cleaning clogged water intakes (Ruiz et al., 1995). Commercial and recreational vessels and beach areas also are vulnerable to the negative impacts of the zebra mussel.

Nonindigenous aquatic plants also have been introduced to the Great Lakes region and inland waters. Purple loosestrife is a wetland plant from Europe and Asia that was introduced to the east coast of North America in the 1800s. Purple loosestrife invades marshes and lakeshores, replacing cattails and other wetland plants. This nonindigenous plant is unsuitable to meet habitat needs – such as cover, food or nesting sites – for a wide range of native wetland animals including ducks, geese, rails, bitterns, muskrats, frogs, toads and turtles.

Eurasian water milfoil, unintentionally introduced to North America from Europe, has spread into inland lakes primarily by boats. Milfoil can proliferate in high densities in lakes, producing habitat conditions that cause serious impairments to commercial fishing and water recreation such as boating, fishing and swimming. The plant's surface canopy also can out-compete and eliminate native aquatic vegetation, as well as threaten native fish and wildlife populations.

Numerous aquatic nuisance species have been introduced and dispersed in the Great Lakes and inland waters of each state by various pathways. The environmental and socio-economic costs resulting from ANS infestations will only continue to rise with further ANS introductions. Although an awareness of the problems caused by aquatic nuisance species is emerging, the solutions are not readily apparent. This comprehensive state management plan for nonindigenous aquatic nuisance species provides guidance for management actions to address the prevention, control and impacts of aquatic nuisance species that have invaded or may invade the Great Lakes region and inland state waters.

3) POLICY BACKGROUND

(Note: The following text offers exemplary language for the "policy background" section of each state management plan. This text is limited to an overview of NANPCA, with a special emphasis on Section 1204 language addressing state management plans. This text should be followed by state-specific background on institutional arrangements, and provisions for ANS prevention and control on the state level.)

The prevention and control of aquatic nuisance species have global implications that require policies and programs at various levels of government. The following overview of the federal *Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990* (Public Law 101-646) *(NANPCA)*, delineates the basic role of federal, regional and state government in the act's implementation. *NANPCA* has served as an important resource in the development of this model state management plan and the states are strongly advised to acknowledge the guidelines of the act in the implementation of the state plans.

Federal Role

NANPCA is the federal legislation which calls upon each state to develop and implement a comprehensive state management plan for the prevention and control of aquatic nuisance species. The act, established for the prevention and control of the unintentional introduction of nonindigenous aquatic nuisance species, is based on the following five objectives as listed in Section 1002 of *NANPCA:*

- to prevent further unintentional introductions of nonindigenous aquatic nuisance species;
- to coordinate federally funded research, control efforts and information dissemination;
- to develop and carry out environmentally sound control methods to prevent, monitor and control unintentional introductions;
- to understand and minimize economic and ecological damage; and
- to establish a program of research and technology development to assist state governments.

NANPCA was primarily created in response to the zebra mussel invasion of the Great Lakes, where this ballast water introduction has caused serious ecological and socio-economic impacts. Although the zebra mussel invasion of the Great Lakes has played a central role in prompting passage of the federal legislation, *NANPCA* has been established to prevent the occurrence of new ANS introductions and to limit the dispersal of aquatic nuisance species already in U.S. waters.

The national Aquatic Nuisance Species (ANS) Task Force, co-chaired by the U.S. Fish and Wildlife Service and the National Oceanic and Atmospheric Administration, was established under Section 1201 of *NANPCA* to coordinate governmental efforts related to nonindigenous aquatic nuisance species in the United States with those of the private sector and other North American interests. An important role of this federal group in the implementation of *NANPCA* is to

facilitate national policy direction in support of the act. The ANS Task Force (consisting of seven federal agency representatives and eight ex officio members representing nonfederal governmental entities) has adopted the *Aquatic Nuisance Species Program* under Section 1202 of the act which recommends the following essential elements:

- ***Prevention***: Establish a systematic risk identification, assessment and management process to identify and modify pathways by which nonindigenous aquatic nuisance species spread.

- ***Detection and Monitoring:*** Create a National Nonindigenous Aquatic Nuisance Species Information Center to coordinate efforts to detect the presence and monitor the distributional changes of all nonindigenous aquatic nuisance species, to identify and monitor native species and other effects, and to serve as a repository for that information.

- ***Control***: The Task Force or any other potentially affected entity may recommend initiation of a nonindigenous aquatic nuisance species control program. If the Task Force determines, using a decision process outlined in the control program, that the species is a nuisance and control is feasible, cost effective and environmentally sound, a control program may be approved.

The ANS Task Force recommends research, education and technical assistance as strategies to support the elements listed above.

The ANS Task Force also provides national policy direction as a result of protocols and guidance that have been developed through the efforts of the following working committees: Research Protocol/Coordination Committee, Intentional Introduction Policy Review Committee, Great Lakes Panel on Aquatic Nuisance Species, Ruffe Control Committee, Risk Assessment and Management Committee, Detection and Monitoring Committee, Zebra Mussel Coordination Committee and the Brown Tree Snake Control Committee.

One role of the federal government in the prevention of unintentional introductions of aquatic nuisance species is defined under Section 1101 of *NANPCA,* which mandates the establishment of regulations for ballast water management aimed at limiting introductions through transoceanic shipping. U.S. regulations control the discharge of ballast from all vessels entering Great Lakes waters, thus far the only region in the United States to be regulated. The regulations have been enforced by the U.S. Coast Guard since May 1993, with active assistance from the Canadian Coast Guard and Seaway authorities. (The Canadian federal government has yet to enact federal ballast water management regulations; voluntary guidelines are in place.) The need has been identified for a federal research program to develop innovative technology for ballast water management.

Regional Role

Great Lakes regional coordination is addressed under Section 1203 of *NANPCA* which calls upon the Great Lakes Commission to convene the Great Lakes Panel on Aquatic Nuisance Species. Panel membership is drawn from a wide range of federal, state, provincial and regional agencies, private sector user groups, Sea Grant programs and environmental organizations, to ensure that the positions of the Panel provide a balanced and regional perspective on Great Lakes issues. The Panel's responsibilities for the Great Lakes region are sixfold: 1) identify Great Lakes priorities; 2) make recommendations to the national ANS Task Force; 3) assist the ANS Task Force in coordinating federal programs within the region, 4) advise public and private individuals on control efforts; and 5) submit annually a report to the ANS Task Force describing prevention, research and control activities in the Great Lakes Basin.

State Role

The comprehensive state management plans for aquatic nuisance species are addressed in Section 1204 of *NANPCA*. Section 1204 requires that the management plan "identifies those areas or activities within the state, other than those related to public facilities, for which technical and financial assistance is needed to eliminate or reduce the environmental, public health and safety risks associated with aquatic nuisance species." The content of each state plan is to focus on the identification of feasible, cost-effective management practices and measures to be pursued by state and local programs to prevent and control aquatic nuisance species infestations in a manner that is environmentally sound. As part of the plan, federal activities are to be identified for prevention and control measures, including direction on how these activities should be coordinated with state and local efforts. Section 1204 also states that in the development and implementation of the management plan, the state needs to involve appropriate local, state and regional entities, as well as public and private organizations that have expertise in ANS prevention and control.

The state management plans are to be submitted to the national ANS Task Force for approval. If the plan meets the requirements of the ANS Task Force, the plan becomes eligible for federal cost-share support. If not, the plan is returned to the state with recommended modifications. (New York is the first and only Great Lakes state, thus far, with an approved plan, resulting in $68,000 in federal cost-share support from the U.S. Fish and Wildlife Service.) Plans may be implemented with other funds supplied by state and cooperative agencies. Further details on the state management plans can be found in Section 1204 of the act.

4) MANAGEMENT ACTIONS

(Note: This section of the model should present the state's management goals, associated problem statements, and the strategic actions and tasks needed to address them. It is recommended that each state's plan center upon the three goals stated below. Each is accompanied by a problem statement, strategic action(s), and task(s). Much of the text is presented in generic form and should be readily adoptable to each state's management plan. State-specific information should be incorporated into the text where relevant. Reference to the Great Lakes Panel's Information/Education Strategy for Aquatic Nuisance Prevention and Control is recommended, when applicable, to assist in developing strategic actions and tasks for the state management plan (refer to ***Attachment 1).***

The goals of this model state management plan are designed to address different stages of ANS invasion: 1) the introduction of the nonindigenous species transported from water bodies from other parts of the continent or world; 2) the spread of an established, reproducing ANS population to other water bodies; and 3) the colonization of ANS populations within water bodies, including the harmful impacts resulting from colonization.

The three goals on which the model state management plan is based are as follows:

- Goal I: Preventing new introductions of nonindigenous aquatic nuisance species into the Great Lakes and inland waters of the state.
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- Goal III: Abating harmful ecological, economic, social and public health impacts resulting from infestation of nonindigenous aquatic nuisance species.

Goal I: Preventing new introductions of nonindigenous aquatic nuisance species into the Great Lakes and inland waters of the state.

Problem: The introduction of nonindigenous aquatic nuisance species into the Great Lakes region, including inland state waters, frequently causes environmental, socio-economic and public health impacts. The severity of these impacts is not known or recognized on a wide-scale basis, impeding the investment of resources needed to prevent new ANS introductions. Also, a delayed "crisis-response" approach often limits the vision and opportunity for the prevention of new introductions, leaving the region with ANS management problems that are economically costly, technically challenging, if not unfeasible to solve, and frequently irreversible. Although 139 nonindigenous aquatic species already have been introduced into the Great Lakes ecosystem, new introductions are still highly likely. The prevention of new introductions is critical in ameliorating ANS problems in the Great Lakes region and in individual states.

Multiple mechanisms transport aquatic nuisance species into the Great Lakes and inland state waters; some such mechanisms transcend the authority of a single state to control. A prime

example is ballast water discharge from transoceanic shipping, the largest source of nonindigenous aquatic species invasions world-wide (Carlton, 1985). The absence of interjurisdictional authority is problematic in regulating the transoceanic vectors transporting aquatic nuisance species to the Great Lakes. Cooperative efforts are necessary between state, federal (i.e., Coast Guard) and international agencies to promulgate and enforce regulations to ensure that ballast management practices and other related transport mechanisms are employed to prevent ANS introductions.

Current technology is frequently inadequate to prevent new introductions of aquatic nuisance species into the Great Lakes and inland state waters. Research on prevention strategies to minimize ANS transport, such as innovative ballast water management technology, is critical in the effective prevention of ANS introductions. Ongoing studies by the U.S. and Canadian Coast Guards indicate that it is especially important to deal with the difficult problem posed by vessels entering the Great Lakes with residual unpumpable ballast water and sediment in their tanks. This medium, potentially harboring a variety of aquatic nuisance species, is often mixed with Great Lakes fresh water and discharged at another Great Lakes port. In order to achieve more effective emptying or flushing of these tanks, the feasibility of altering the current design of ballast tanks needs to be examined.

Other significant transport mechanisms increasing the potential for new introduction of aquatic nuisance species into the Great Lakes and inland state waters include the aquaculture business, commercial barge traffic, recreational boating, the bait industry and fish stocking activities – all of which have the potential to introduce aquatic nuisance species as well as associated parasites and other disease organisms. In some cases, such activities are subject to little or no regulations. In cases where laws/regulations do exist, they are frequently not well-publicized and/or enforced. User groups that could potentially introduce aquatic nuisance species into the Great Lakes region/states are generally not adequately informed of ANS prevention practices.

Strategic Action: In partnership with other states, develop state-specific and regional listings of aquatic nuisance species that have the potential to infest the Great Lakes and inland state waters. As part of this cooperative effort, identify existing and potential transport mechanisms that facilitate new ANS introductions.

Task: Research and/or support research on the movement of aquatic nuisance species on a global scale, and use findings to help predict potential ANS invasions in the Great Lakes and inland state waters.

Strategic Action: Establish interjurisdictional approaches to facilitate legislative, regulatory and other actions needed for the prevention of new ANS introductions into the Great Lakes and inland state waters.

Task: Establish and support coalitions among the Great Lakes states, including ANS officials from the state natural resource agencies, the Coastal States Organization and

coastal managers, tribal groups, recreational boater and angler groups and other concerned resource users. Assist coalitions in promoting federal legislation and programmatic support for the prevention of new ANS introductions in the region/state.

Task: Establish and support an interjurisdictional process to ensure compatibility and consistency between Great Lakes states and between states and federal agencies. (Federal consistency, a tool implemented by coastal management programs to ensure that federal activities/projects are compatible with enforceable policies of the state, is recommended to facilitate interjurisdictional endeavors.)

Task: Initiate and implement a Great Lakes regional approach through the Great Lakes Panel on Aquatic Nuisance Species to prevent new introductions of aquatic nuisance species into the Great Lakes and inland state waters.

Strategic Action: Promulgate, publicize and enforce state legislation and regulations to prevent new ANS introductions into state waters, including both the Great Lakes and inland waters.

Task: Establish an interagency task force (with representation from public and private sectors) to develop regulations for state legislative consideration. State coastal management personnel should play a role in the process to ensure that proposed rules for this are consistent with and build upon existing authorities. (Note: A recommended resource to facilitate this process is the national ANS Task Force publication, *Findings, Conclusions, and Recommendations of the Intentional Introductions Policy Review* (see literature citations).)

Task: Develop and implement an outreach program that informs relevant groups of the regulations, their rational and compliance procedures.

Task: Develop and implement enforcement programs.

Strategic Action: Develop/maintain monitoring programs in the Great Lakes region/states to provide for early detection and prevention of infestations of aquatic nuisance species into unaffected watersheds.

Task: Establish/participate in monitoring programs that emphasize partnerships between federal/state/local agencies; business/industry; academic institutions; and resource user groups. The feasibility of various technologies (e.g., Geographic Information Systems (GIS)) should be explored in designing such programs.

Strategic Action: Conduct or support research regarding management options that will help prevent new introductions of aquatic nuisance species into the Great Lakes and inland state waters.

Task: Assess the transport mechanisms potentially responsible for new ANS introductions into the Great Lakes and inland state waters. Develop preventive action plans to interrupt pathways of introduction.

Task: Analyze current shipping practices regarding the transport of aquatic nuisance species into the Great Lakes and determine the need for improvement of current controls on vessels to impede this transport.

Task: Conduct research on ballast water management as a primary ANS transport mechanism. Research should focus on the feasibility of retrofitting and redesigning current ballast tanks in order to allow more effective flushing or filtering of both full tanks and those holding unpumpable residual ballast.

Task: Examine climate change scenarios in relation to habitat alterations in the Great Lakes region to predict the potential effect on new ANS introductions into the Great Lakes and inland state waters.

Strategic Action: Conduct an effective information/education program on the prevention of new ANS introductions in the Great Lakes and inland state waters.

(Note: A recommended resource to assist in accomplishing this strategic action is the Great Lakes Panel's *Information/Education Strategy for Aquatic Nuisance Prevention and Control* (refer to **Attachment 1).)**

Task: Identify the relevant Great Lakes regional/state user groups (i.e. shipping industry, aquaculture business, recreational boating/angler groups, bait and tackle establishments, state agency stocking programs) and secure representation from each group on an advisory team that takes an active role in the development of the ANS state management plan.

Task: Develop information/education strategies for resource user groups identified as playing a significant role in ANS introduction. Information/education efforts should focus on the practices that can help prevent ANS transport and introduction into the Great Lakes and inland state waters. As part of information/education initiatives, identify, when appropriate, the need for a regulatory approach in the prevention of ANS introductions.
Task: Establish monitoring/tracking programs to evaluate the effectiveness of information/education efforts.

Goal II: Limiting the spread of established populations of nonindigenous aquatic nuisance species into uninfested waters of the state.

Problem: The spread of established populations of nonindigenous aquatic nuisance species into uninfested state waters is largely via human activity, such as boat transfers, ballast exchange, bait handling, water transport, and ornamental and landscape practices. Limiting the spread of such populations is problematic due to the numerous pathways of dispersal, the complex ecological characteristics associated with ANS populations and the lack of feasible technology that is needed to limit the spread.

Many public and private resource user groups are not aware of existing infestations of aquatic nuisance species in the Great Lakes and inland state waters, and why they cause priority problems locally, regionally and beyond. The probability of ANS spread to other waters can increase when resource user groups are not aware of how their routine activities can cause the dispersal of aquatic nuisance species into uninfested water bodies. An information/education program is needed to provide information on why the spread of ANS populations needs to be limited, how the ANS populations can be reduced, and the value of a healthy aquatic ecosystem that supports a diverse native aquatic community. Information/education programming is also critical to strengthening public/private support for and statewide participation in ANS management strategies.

It also is difficult to manage the spread of aquatic nuisance species, since infestation frequently occurs in watersheds that occupy more than one state. Cooperation among Great Lakes states sharing ANS-infested watersheds is needed to implement consistent management strategies that will effectively limit the spread of ANS populations.

Strategic Action: Identify and prioritize aquatic nuisance species whose spread should be limited.

Task: Establish an advisory group, with representation from all stakeholders affected by the ANS problems in the state, to guide in the selection of aquatic nuisance species that merit management.

Task: Develop and implement a process to prioritize those aquatic nuisance species that merit management. (Note: An assessment of ANS impacts discussed under Goal III is recommended for this process. Also, a recommended resource to facilitate this prioritization process is the National Park Service publication, *Handbook for Ranking Exotic Plants for Management and Control* (see literature citations).)

Strategic Action: Monitor the spread of those aquatic nuisance determined to be a state priority.

Task: Design a monitoring program to provide information that will help in developing an effective strategy to limit the spread of selected ANS populations. A network approach, including federal/regional/state/local agencies, public/private groups and academic institutions, is recommended. Variables to monitor include population size, structure and range; rate of growth; type of habitat; distribution; impacts on native species; and economic and other impacts on human communities.

Task: Develop identification materials for each aquatic nuisance species that is being monitored to facilitate participation of all stakeholders.

Strategic Action: Develop and implement management strategies to limit the spread of each aquatic nuisance species determined to be a state priority.

Task: Based on identified dispersal pathways, develop voluntary and regulatory approaches to limit the spread of aquatic nuisance species. Also, identify the best available technology for each management strategy and include an environmental impact assessment, where necessary.

Task: Implement a watershed approach to limit the spread of aquatic nuisance species within the state.

Task: Establish cooperative policies with states sharing watersheds to limit the spread of ANS populations.

Strategic Action: Inform and educate the appropriate resource user groups on the management strategies needed to limit the spread of targeted ANS populations. To support this effort, the target groups should be informed on how the spread of aquatic nuisance species threatens the health of a diverse native aquatic community, and other harmful ANS impacts. Volunteer groups, such as lake associations and outdoor recreation groups, should be actively involved in these outreach efforts.

(Note: A recommended resource to assist in accomplishing this strategic action is the Great Lakes Panel's *Information/Education Strategy for Aquatic Nuisance Prevention and Control* (refer to **Attachment 1).)**

Task: Assess existing ANS information/education programs (i.e., Sea Grant, cooperative extension, state natural resource agencies). Build on the strengths and address the weaknesses of these programs.

Task: Identify pathways that disperse aquatic nuisance species (i.e., recreational boaters/anglers, commercial and sport fishers, bait handling, water transport, ornamental and landscape practices) and inform these groups on practices to help limit the spread. This outreach program should focus on changing the behavior of user groups to limit the spread of targeted ANS populations in the Great Lakes and state inland waters.

Task: In cooperation with other Great Lakes states, establish a voluntary intra-lake ballast water management program that will inform ship owners, captains, engineers and other commercial shipping personnel of how to improve ballast management practices to impede the transfer of aquatic nuisance species within the Great Lakes system.

Task: Coordinate with state coastal management programs to ensure, where appropriate, that public access projects and interpretive displays include information about aquatic nuisance species.

Task: Establish monitoring/tracking programs to evaluate the effectiveness of information/education efforts.

Strategic Action: Promulgate, publicize and enforce state regulations to limit the spread of aquatic nuisance species within the state.

Task: Establish an interagency task force (with representation from public and private sectors) to develop regulations for state legislative consideration. State coastal management personnel should play a role in the process to ensure that proposed rules for this are consistent with and build upon extant authorities.

Task: Develop and implement an outreach program that informs relevant groups of the regulations and why they exist, and compliance procedures.

Task: Develop and implement enforcement programs.

Strategic Action: Support/coordinate scientific research between state and federal agencies and academic institutions that investigate potential management strategies to limit the spread of ANS populations and associated environmental impacts.

Task: Prioritize research needs to help in establishing program structure.

Task: Conduct priority research, or promote the conduct of such research via federal research initiatives, academia or the private sector.

Task: Develop a technology transfer program to be used in distributing research findings. (The Internet-based Great Lakes Information Network is the recommended vehicle for this process.)

Goal III: Abating harmful ecological, economic, social and public health impacts resulting from infestations of nonindigenous aquatic nuisance species.

Problem: The infestation of nonindigenous aquatic nuisance species in the Great Lakes and inland state waters can cause, to varying degrees, ecological, economic, social and public health impacts. Strategies to control aquatic nuisance species in infested water bodies, in efforts to abate their impacts, are not always known or technically and/or economically feasible. Control strategies also must be designed so as not to cause significant environmental impacts.

The infestation of aquatic nuisance species in the Great Lakes and inland state waters can alter or disrupt existing relationships and ecological processes. Without co-evolved parasites and predators, some nonindigenous aquatic species out-compete and even displace aquatic native plant or animal populations. As part of this process, the invading species also can influence to some extent the foodwebs, nutrient dynamics and biodiversity of the ecosystem. To abate the ecological impacts of the invading organism, it is necessary to understand the mechanisms by which the species disrupts the natural balance of the ecosystem.

The Great Lakes and inland state waters provide valuable economic benefits for the region/state, some of which include commercial and sport fisheries, recreational use and water usage by manufacturers, industry and electric power companies. Some introduced aquatic nuisance species to the Great Lakes region/state have provided economic benefits, such as those supporting the aquaculture business and sport fishing industry. However, several aquatic nuisance species have been found to cause adverse economic impacts. For instance, the zebra mussel infests the intake/discharge pipes of hundreds of facilities that use raw water from the Great Lakes, causing extensive monitoring and control costs. The Eurasian water milfoil forms thick mats on the surface of water, which can interfere with many types of water recreational activities, such as swimming, water skiing and sailing. The invasion of the ruffe in Duluth-Superior Harbor appears to be causing the displacement of perch and whitefish populations, which could pose a serious threat to the commercial and sport fishing industry if the ruffe invasion spreads throughout the Great Lakes and inland state waters.

Organisms invading the Great Lakes and inland state waters can threaten public health through the introduction of disease, concentration of pollutants, contamination of drinking water, toxic algae blooms and other harmful human health effects (Ohio Sea Grant College Program, 1995). An extensive monitoring system for these aquatic nuisance species needs to be established to prevent human health problems from occurring in the Great Lakes region/state.

It is often difficult to assess the ecological, socio-economic and public health impacts of aquatic nuisance species in terms that are meaningful to decisionmakers and the general public. Action(s) to abate ANS impacts through control strategies is frequently impeded by circumstances, such as the absence of political support and the lack of resources needed to effectively develop and implement control strategies.

Strategic Action: Assess the ecological, socio-economic and public health impacts of aquatic nuisance species in the Great Lakes and inland state waters. Use this assessment as guidance to develop action levels that warrant implementation of control strategies (Note: Consult New York State's Department of Environmental Conservation (NYSDEC) management plan for a useful assessment of ANS impacts (i.e., beneficial, innocuous, nuisance, detrimental), which may helpful in determining action levels for control. Also, a recommended resource to facilitate this process is the National Park Service publication, "Handbook for Ranking Exotic Plant for Management and Control," (see literature citations).)

Task: Identify and assess the damages of aquatic nuisance species that threaten the ecological health of the Great Lakes region.

Task: Identify and assess the damages of aquatic nuisance species that threaten public safety and/or human health of the state's residents.

Task: Identify and assess economic costs for each aquatic nuisance species causing damage to water users.

Strategic Action: Based on the above impact assessments, develop and implement control strategies, including physical, chemical and biological mechanisms, to eradicate or reduce populations of targeted aquatic nuisance species in the Great Lakes and inland state waters (i.e., those aquatic nuisance species identified by each state as causing detrimental ecological, economic, social and/or public health impacts).

Task: Establish protocols that will provide guidance in designing and implementing control strategies. An example from the NYSDEC management plan contains the following criteria for design of such methods:

- *The control strategy must not create problems greater than those related to the aquatic nuisance species itself;*
- *A control strategy must not have serious, long-term impacts to the environment or non-target organisms;*
- *There must be a need to control the aquatic nuisance species due to causing, or the potential of causing, adverse impacts;*
- *The control strategy must not reduce the human utilization of the water body (with the exception of those waters with special resource designation) or threaten human health;*
- *Control efforts should be directed against the areas significantly impacted, and not be broad and general in nature;*
- *The control strategy must have a reasonable likelihood of succeeding.*

These criteria may be applicable to other states.

Task: Support/coordinate scientific research between state and federal agencies and academic institutions that investigate potential control strategies and associated environmental impacts. Develop a technology transfer program to be used in distributing research findings. (The Internet-based Great Lakes Information Network is the recommended vehicle for this process.)

Task: Establish mechanism(s) to ensure that the control strategies developed and implemented by the state are done so in coordination with federal agencies, tribal authorities, local governments, interjurisdictional organizations and other appropriate entities (*NANPCA*, Section 1202).

Task: Establish mechanism(s) to ensure that the control strategies are based on the best available scientific information and conducted in an environmentally sound manner (*NANPCA*, Section 1202).

Strategic Action: Develop and implement means of adapting human activities to accommodate infestations of aquatic nuisance species.

(Note: Specific tasks, which will vary from one state to the next, should be inserted here).

Strategic Action: Conduct an information/education program providing information on ANS impacts and related control strategies. Utilize existing groups/programs responsible for information dissemination (Sea Grant, state natural resource agencies, cooperative extension services, coastal management programs) when appropriate.

(Note: A recommended resource to assist in accomplishing this strategic action is the Great Lakes Panel's *Information/Education Strategy for Aquatic Nuisance Prevention and Control* (refer to **Attachment 1).)**

Task: Design programs targeting public agencies needed in promoting management action to abate impacts; user groups needed for effective control of targeted species; and communities that need to learn how to live with aquatic nuisance species problems.

Task: Establish monitoring/tracking programs to evaluate the effectiveness of information/education efforts.

5) IMPLEMENTATION

(Note: Implementation – in terms of tasks, budgets and timelines – is an important component of any state management plan. The following implementation schedule and timeline, excerpted from the Great Lakes Panel's Information/Education Strategy, are presented for illustrative purposes only. It is recommended that each state use this general tabular format as guidance for inserting its own specific plan goals, strategic actions and tasks.)

To facilitate effective implementation of the state management plan, the state authorities are strongly encouraged to carefully assign the office(s) best suited to implement the plan. This process will entail the establishment of an infrastructure of agencies equipped to address the identified strategic actions and tasks of the plan.

EXAMPLE IMPLEMENTATION SCHEDULE

Goal II: Limiting the spread of established nonindigenous aquatic nuisance species into uninfested waters of the state.

Strategic Actions Tasks	Lead Agency	Cooperating Organizations	Source of Funding	Budget (State/Federal)	Status/Progress Report
Information/Education Evaluate existing ANS outreach program	Great Lakes Panel (GLP)	State Nat.Res. Agency, Sea Grant, State Coastal Mgmt. Prog., Tribal Authority, Academic Instit. USFWS, U.S. Coast Guard	GLP (staff support) State Agencies (staff support)	State: $5,000 Federal: (to be determined)	Preliminary stages of development
Information/Education Identify ANS dispersal groups and inform on management practices	State agencies	Sea Grant, Coastal Mgmt. Prog., GLP, Tribal Auth., U.S. Coast Guard, Lake Assoc.	Coastal Mgmt. Program (Access Project), Sea Grant Project Funding, watercraft surcharges	State: (to be determined) Federal: (to be determined)	(to be determined)
Information/Education Establish outreach activities in support of ballast management program	U.S. Coast Guard	Lake Carriers' Assoc., USFWS, Sea Grant, state agencies	Shipping Assoc., U.S. Coast Guard, State Coastal Mgmt. Prog.	State: (to be determined) Federal: (to be determined)	(to be determined)

(Note: This Implementation Schedule is presented for illustrative purposes only.)

EXAMPLE TIMELINE
(quarterly timeline to cover a three year-period)

Goal II: Limiting the spread of established nonindigenous aquatic nuisance species into uninfested waters of the state.

Strategic Actions Tasks	1	2	3	4	5	6	7	8	9	10	11	12
Information/Education Evaluate existing ANS outreach program	X------	-----X										
Information/Education Identify ANS dispersal groups and inform of control practices				X------	---------	---------	---------	-------X				
Information/Education Establish voluntary ballast management program		X-------	---------	---- X								

(Note: This three-year timeline is presented for illustrative purposes only)

6) PROGRAM MONITORING AND EVALUATION

(Note: An monitoring/evaluation section should be included in each state management plan as a means to monitor progress, evaluate implementation problems/needs and make necessary "mid-course" corrections. Each state's management plan will be unique; the monitoring/evaluation methodology will vary from one state to the next. The following recommendations are presented as guidance to the states when developing their own evaluation plan.)

- An oversight committee or subcommittee should be established within the plan implementation process for the purposes of conducting the monitoring/evaluation efforts, disseminating the results and identifying plan amendments that address outcomes.

- The three plan goals, as presented earlier, should provide the focal point for monitoring/evaluation. Means to assign measurable objectives to these goals should be pursued to provide meaningful evaluation.

- The evaluation effort should place a special emphasis on funding needs to successfully accomplish goals and associated tasks. This information will be useful for program planning purposes.

- The evaluation process should be inclusive, involving those with implementation responsibility, resource user groups and others affected by plan implementation. An emphasis should be placed on identifying evaluation findings with applicability to other states.

- The preparation and dissemination of an annual report highlighting implementation progress, including an evaluation of the efficacy of the plan's strategies and tasks, is strongly recommended. The target audience of the report should include the general public and local, state and federal decisionmakers. Incorporation of these program reports in the biennial water quality reports to the U.S. Congress and U.S. Environmental Protection Agency (Section 305b reports of the federal Clean Water Act) is advised, to broaden awareness of ANS issues.

7) GLOSSARY

(Note: The management plan should include a glossary presenting clear definitions of selected terms used in the plan. For illustrative purposes, a series of definitions follows, drawn from Section 1003 of NANPCA with the exception of that marked with (*). It is recommended to use terms defined in NANPCA when appropriate. Each state will want to add other terms/definitions, as needed.)

aquatic nuisance species: An aquatic nuisance species that threatens the diversity or abundance of native species, the ecological stability of infested waters, or commercial, agricultural, aquaculture or recreational activities dependent on such waters. (Note: For purposes of the state management plans, reference to an aquatic nuisance species will imply that the species is nonindigenous.)

ballast water: Any water and associated sediments used to manipulate the trim and stability of a vessel.

environmentally sound: Methods, efforts, actions or programs to prevent introductions or control infestations of aquatic nuisance species that minimize adverse impacts to the structure and function of an ecosystem and adverse effects on nontarget organisms and ecosystems and emphasize integrated pest management techniques and nonchemical measures.

federal consistency (*): A requirement under the Coastal Zone Management Act that stipulates that federal actions that are reasonably likely to affect land or water use or natural resources of the coastal zone be consistent with the enforceable policies of a coastal state's federally approved coastal management program (CMP). A coastal state reviews the federal action to determine if the proposed action will be consistent with the CMP.

Great Lakes: Lake Ontario, Lake Erie, Lake Huron (including Lake St. Clair), Lake Michigan, Lake Superior, and the connecting channels (Saint Mary's River, Saint Clair River, Detroit River, Niagara River, and Saint Lawrence River to the Canadian Border), and includes all other bodies of water within the drainage basin of such lakes and connecting channels.

nonindigenous species: Any species or other viable biological material that enters an ecosystem beyond its historic range, including any such organism transferred from one country to another.

waters of the United States: The navigable waters and the territorial sea of the United States.

unintentional introduction: An introduction of nonindigenous aquatic species that occurs as the result of activities other than the purposeful or intentional introduction of the species involved, such as the transport of nonindigenous species in ballast or in water used to transport fish, mollusks or crustaceans for aquaculture or other purposes.

8) RECOMMENDED APPENDICES

(Note: The following information is recommended to be included as appendices to the management plan. Each state may identify additional materials.)

- Section 1204 of the *Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990* (P.L. 101-646)
- List of members of relevant task forces/committees
- State laws and regulations
- *Information/Education Strategy for Aquatic Nuisance Prevention and Control*, prepared by the Information/Education Subcommittee of the Great Lakes Panel on Aquatic Nuisance Species
- Other relevant management plans
- Reference materials
- Emergency contacts
- Literature cited (see next page)

LITERATURE CITED

(Note: It is recommended that each management plan include a section for citation of literature. The following list is provided for illustrative purposes based on the literature used in this document.)

Aquatic Nuisance Species Task Force (D. James Baker, Under Secretary of Commerce for Oceans and Atmosphere and Mollie Beattie, Director of U.S. Fish and Wildlife Service). 1994. *Report to Congress: Findings, Conclusions, and Recommendations of the Intentional Introductions Policy Review.*

Carlton, J.T. 1985. *Transoceanic and Interoceanic Dispersal of Coastal Marine Organisms: The Biology of Ballast Water.* Oceanography and Marine Biology, An Annual Review: volume 23.

Hushak, L.J., Y. Deng, M. Bielen. 1995. *The Cost of Zebra Mussel Monitoring and Control.* ANS Digest: volume 1, number 1.

Leigh, P. 1994. *Benefits and Costs of the Ruffe Control Program for the Great Lakes Fishery.* National Oceanic and Atmospheric Administration Report.

New York State Department of Environmental Conservation, Division of Fish and Wildlife. 1993. *Nonindigenous Aquatic Species Comprehensive Management Plan.*

Ohio Sea Grant College Program. 1995. *Sea Grant Zebra Mussel Report: An Update of Research and Outreach: 1988-1994.* The Ohio State University.

Ruiz, G.M., A.H. Hines, L.D. Smith, J.T. Carlton. 1995. *An Historical Perspective on Invasion of North American Waters by Nonindigenous Aquatic Species.* ANS Digest: volume 1, number 1.

U.S. Congress, *Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990*, Public Law 101-646.

U.S. Congress, Office of Technology Assessment. 1993. *Harmful Nonindigenous Species in the United States.* OTA-F565.

U.S. Department of the Interior, National Park Service. 1991. *Handbook for Ranking Exotic Plant for Management and Control.* Authored by R.D. Hiebert and James Stubbendieck. (Copies of this report (Natural Resources Report NPS/NRMWRO/NRR-93/08) are available from: Publications Coordinator, National Park Service, Natural Resources Publications Office, P.O. Box 2587 (WASO-NRPO), Denver, CO 80225-0287).

U.S. Fish and Wildlife Service, Department of the Interior. 1995. *Report to Congress: Great Lakes Fishery Resources Restoration Study.*

ATTACHMENT 1

Information/Education Strategy for Aquatic Nuisance Prevention and Control

Information/Education Strategy for Aquatic Nuisance Prevention and Control
Final Draft

Prepared by: Information/Education Subcommittee, Great Lakes Panel on Aquatic Nuisance Species

Statement of Purpose: The primary purpose of the Information/Education (I/E) strategy is to provide regional direction and coordination regarding I/E activities on aquatic nuisance species (ANS) among the participating agencies, institutions and organizations. It is important to note that while some of these activities may be undertaken specifically by the Great Lakes Panel, many of the activities may be underway or taken on by other Great Lakes organizations. The I/E strategy is being established as a regional initiative for the benefit of all interested stakeholders!

Goal I: The prevention of the unintentional introduction and dispersal of aquatic nuisance species into, within and from Great Lakes waters through implementation of I/E activities.

Problem: *The unintentional introduction and dispersal of aquatic nuisance species, from a variety of sources, are causing major financial, ecological and social impacts to the Great Lakes region.*

Objective: Ensure that all commercial vessels entering the Great Lakes comply with voluntary and mandatory preventative measures regarding the unintentional introduction and dispersal of aquatic nuisance species.

> **Activity:** Informational brochure targeted to the commercial shipping industry. Develop a brochure for ship owners, captains, engineers, and other commercial shipping personnel with the primary purpose of behavior change regarding ballast management practices. ANS issues to be included: 1) history of the ANS problem in the Great Lakes; 2) causes of the ANS problem (i.e. ballast water exchange, attachment to hulls and anchors); 3) risks posed by the ANS problem; 4) shipping practices that would reduce the risk of introducing and dispersing aquatic nuisance species (i.e. guidelines for ballast water exchange); 5) the regulations on ballast water exchange, and the consequences of noncompliance.

Objective: Encourage and foster voluntary compliance with the ruffe control activities on Lake Superior.

> **Activity:** Develop a public outreach program (i.e. public meetings, video, brochures) to gain public understanding and support for proposed ruffe control activities.

Objective: Ensure that all permitted aquaculture operators, bait dealers, aquarium hobbyists, commercial fishers, and other resource harvesters, take action to prevent the introduction and dispersal of aquatic nuisance species.

Outreach activities targeted to permitted aquaculture operators and bait dealers.

> **Activity:** Develop a workshop series and supporting materials that can be conducted by local and state agencies, targeted to permitted aquaculture operators, bait dealers, aquarium hobbyists, commercial fishers, and other resource harvesters. This audience should be informed about their role mitigating the introduction and spread of aquatic nuisance species. As part of workshop activities, the targeted audience should be trained on how to deliver the "message" to their clientele.

> **Activity:** Distribute informational materials and regulations about aquatic nuisance species to permitted aquaculture operators, bait dealers, aquarium hobbyists, commerical anglers, and other resource harvesters in the Great Lakes states. Due to frequent modification of the information and regulations, distribution in each state should occur annually or biennially.

Objective: Ensure that all recreational boaters take action to prevent the introduction and dispersal of aquatic nuisance species.

Outreach activities targeted to recreational boaters.

Activity: Distribute existing I/E resources, such as those developed by the Great Lakes Sea Grant programs, targeted to recreational boaters through the following channels: 1) Coast Guard Auxiliary safe boating courses and watercraft examinations; 2) boat manufacturers' owners' manuals; 3) marine dealers; 4) state boat registration materials; 5) power squadron courses; 6) boat show displays and sport shows.

Activity: Promote the development and distribution of standardized signs and billboards to deliver the "message" on aquatic nuisance species at waterfront areas and along major transportation routes used by boaters.

Activity: Implement regional boat-wash demonstrations and/or inspections to teach boaters how to prevent the spread of aquatic nuisance species on their boats. To impede the spread to inland waters, target areas where there is high traffic between Great Lakes Basin and inland waters. Inspections should be conducted at public accesses on infested waters.

Activity: Include information about aquatic nuisance species in state/provincial fishing regulations.

Activity: Develop and distribute radio public service announcements about aquatic nuisance species to draw attention to the issue and provide precautions that boaters should take to prevent further spread.

Activity: Notify tourism related industries, such as travel agencies and resorts, of the informational materials available for distribution and/or posting.

Activity: Develop I/E materials that will help pave the way for appropriate laws to be enacted that will reduce the risk of aquatic nuisance introduction and spread.

Goal II: Regional coordination of information dissemination regarding aquatic nuisance species programs involving prevention, control, monitoring, research, education, policy and other related activities.

Problem: *Outreach products and activities regarding aquatic nuisance species are not adequately coordinated among/between agencies, institutions and organizations -- causing duplication of efforts, unnecessary expenditures of financial resources, and inconsistencies/confusion in the "message" being delivered.*

Objective: Provide coordinated, non-conflicting outreach programming to the public and private sector regarding ANS issues.

Activity: Inventory and Evaluation of ANS outreach programming. Conduct an inventory to determine the status of existing outreach resources and to identify the gaps in outreach programming. Based on inventory findings, provide guidance (i.e. policy statement) to agencies, institutions and organizations that 1) supports coordination of existing outreach resources and 2) assists in planning efforts regarding the development of future outreach programming.

Activity: Training sessions for educators/information providers in formal and non-formal settings. Under the auspices of the Panel, and in partnership with key members, identify existing and prospective opportunities to work with educators/information providers in the classroom and non-

formal settings. Such training sessions can be a vehicle for presenting I/E packets and available curricula materials to (and opening the lines of communication with) a targeted group of educators that will then carry the message to a much larger audience. Two options can be pursued, either singly or in combination: a Panel/agency sponsored event to which a group of educators from an array of relevant settings are invited, or a "user-group" sponsored event to which a Panel/agency member is invited to speak.

Activity: Evaluate I/E materials and distribution methods for outreach programs targeted to Great Lakes user groups. With assistance from Panel members, identify and pursue means to better utilize fact sheets as an effective tool for disseminating information. This will entail assembling and reviewing all existing fact sheets and related materials; identifying and filling gaps; assessing effectiveness of distribution mechanisms; and exploring and pursuing opportunities to combine disparate fact sheets into I/E "kits" for broad distribution. The latter is a promising option involving the development of a single "kit" which contains the materials from many different groups, thus providing the reader with numerous contacts for more detailed information.

Activity: Newsletter inserts. A number of organizations currently produce newsletters that provide a valuable service in disseminating ANS information to user groups and the interested public. While a new, entirely separate newsletter from the Great Lakes Panel is not well-advised for that reason, there is a need to enhance the overall breadth and readership of existing newsletters. An effective vehicle for doing this is a one page (two-sided) newsletter insert produced by the Panel for inclusion in the many existing Great Lakes newsletters, both those that are ANS specific and others more general in nature. Panel members would determine an appropriate format and content and assist Commission staff in preparation. A copy would be developed most likely on a quarterly basis, and be provided to newsletter editors for incorporation.

Activity: Audio-Visual program on ANS problem. Produce slide show and/or video to raise awareness among Great Lakes Basin residents on the ANS problem. It is recommended that the Great Lakes Panel play an active role in developing the "message" for this A-V program, to ensure that the information presented is balanced and consistent.

Activity: Computer access to ANS information. Provide computer access to ANS information through the Great Lakes Information Network (GLIN), a regional electronic information system that is being established under the guidance of the Great Lakes Commission. GLIN will link data, information and individuals in key agencies and organizations in the Great Lakes region and Washington D.C. through the Internet, a worldwide research network. The purpose of GLIN is to enhance communication and share information between the region's policymakers to improve the quality of public policy decisions; and to provide quick access to current information/data.

This activity will be coordinated with the efforts of Minnesota Sea Grant to place zebra mussel outreach materials on the Internet system. Efforts under GLIN will also be conducted in

cooperation with existing information clearinghouse functions, such as the Sea Grant Zebra Mussel Research Information Clearinghouse in New York.

Activity: Program evaluation. Assess the effectiveness of various outreach methods and products in terms of facilitating regional coordination of information dissemination. This activity will be conducted in collaboration the Great Lakes Sea Grant Network evaluation of zebra mussel outreach programs, targeting primarily industrial and municipal water users.

Problem: *A complete network does not exist for communication to facilitate information transfer between agencies, institutions, and organizations on ANS research needs and findings.*

Objective: Strengthen lines of communication (networks, publications, meetings/conferences, etc.) used by ANS researchers to facilitate information transfer regarding ANS research needs and findings.

> **Activity:** Evaluation of ANS research network. Identify existing lines of communication used by ANS researchers to determine how the network can be strengthened. This exercise will be done in collaboration with the International Joint Commission's initiative to develop an ecosystem approach to research management.
>
> **Activity:** Supporting enhanced use of the *Great Lakes-St Lawrence Research Inventory*, developed by the Council of Great Lakes Research Managers, International Joint Commission. Work with the IJC staff to expand the ANS component of its research inventory, and promote its use as a coordination tool among researchers, managers, and policy makers. To date, *Inventory* efforts have involved assessment of the status of research on nonindigenous species, based on the number of research projects and associated funding for each species that has been introduced into the Great Lakes. The *Inventory* could be further enhanced in its capacity to track research, monitoring, and control measures, and to identify related funding priorities. Enhanced use of the *Inventory* will entail submitting Panel advice on how to maximize its usefulness in terms of breadth, format, accessibility, dissemination and use of information in management/policy settings.

Problem: *The roles and coordination of agencies, institutions, and organizations involved with aquatic nuisance prevention and control are not completely understood.*

Objective: Provide access to current information regarding ANS contacts and their roles from all state, provincial, tribal and federal governments and other organizations participating in aquatic nuisance prevention and control.

> **Activity:** Computer information exchange regarding ANS actors. Develop a database on ANS contacts and their role in addressing the ANS problem. Provide interested parties access to the database through the Great Lakes Information Network (GLIN), a computer information system that will also allow questions to be addressed "on line."

Problem: *The I/E network is not fully coordinated to effectively disseminate information on aquatic nuisance species activities between agencies, institutions and organizations.*

Objective: Strengthen existing lines and establish new lines of communication between agencies, institutions, organizations to facilitate coordinated information dissemination.

> **Activity:** Regional Information Clearinghouse Services. Through discussions with existing clearinghouses (including Sea Grant and state/provincial efforts), determine the current level of operation, types of services, funding base and unmet needs. On the basis of that investigation, the Panel can identify and act on its findings to ensure the availability of needed services over the long-term.

Goal III: The active involvement of Great Lakes regional policymakers and user groups in the promotion of aquatic nuisance prevention and control programs.

Problem: *Policymakers may not be fully aware of the financial and irreversible ecological and social damage caused by aquatic nuisance species. As a result, the aquatic nuisance species issue may not be a priority on the agenda of some policymakers.*

Objective: Assess the economic, environmental and social impacts caused by the infestation of aquatic nuisance species and predict how these impacts will affect various Great Lakes areas.

Activity: Economic Cost Evaluation of Zebra Mussel Infestation. In the interest of contributing to the database on ANS impacts, conduct a survey of municipal and industrial water users affected by (or susceptible to) ANS infestation – principally zebra mussels. Working with Ohio Sea Grant researchers and Panel membership, the Commission staff will design and administer a survey to municipal and industrial water users in the Basin with intakes susceptible to zebra mussel infestation problems. The survey will yield information on economic costs associated with operation and maintenance, new/altered intake structures, and associated equipment necessitated by zebra mussel problems. Beyond the economic data, it will also yield information on control technologies being applied, long-term strategies, I/E needs, research needs, and public policy needs. Due to the magnitude of the task, the survey results will not likely be comprehensive, but will serve to document trends regarding economic impacts and promoting necessary actions to address the problem over the long-term. Also, the results will provide information to the Panel to assist in directing its own efforts.

Objective: Educate decision-makers on the economic and environmental impacts resulting from aquatic nuisance species infestation in the Great Lakes and the need for significant increased funding to mitigate these impacts.

Activity: Outreach strategy targeted to elected officials and policymakers. Develop and implement an outreach strategy that will frame ANS issues to address the agenda priorities of elected officials and policymakers pivotal in establishing the legislative mandates and funding necessary to develop and implement regional solutions to the ANS problems. An important step in developing this strategy is determining the type of economic, ecological and social information that would gain the support of policymakers in their decisions regarding ANS issues.

The "message" can be delivered through an array of mechanisms, such as succinct fact sheets and brochures; legislative briefings; expert testimony at hearings; congressional/parliamentary dialogues; and the Annual Report on Aquatic Nuisance Species (refer to activities listed below).
One promising model for developing an outreach strategy for elected officials and policymakers is Michigan's Sea Grant legislative outreach strategy on the zebra mussel. The program, entitled, *Michigan Great Lakes Legislative Update,* supplies state legislators (and their staff and research offices) with comprehensive information on the zebra mussel problem, related legislation and updates on research findings. In developing this strategy, it was found that legislators value information they can directly use in the decision-making process.

Activity: Informational brochure for state/provincial legislators and other elected officials. Design, print and distribute an informational brochure targeted to legislative leadership throughout the binational Great Lakes Basin. The brochure, in a concise, lay person-oriented format employing photographs, charts and graphs, would introduce legislators to the magnitude and urgency of the issue, economic and environmental aspects, current legislative and program initiatives, and agencies and individuals to contact for more information. Most importantly, it could present recommendations of the Great Lakes Panel -- a "blueprint" for action that might include legislative programs and budget needs.

Activity: Congressional/Parliamentary dialogue and related initiatives at the national/binational levels. Pursue a series of distinct, yet related events (primarily in Washington D.C.) designed to elevate and maintain the policy profile of aquatic nuisance species issues, and associated legislative, program and budgetary needs. Specifically this will entail:

1) Adding an aquatic nuisance species component to the Congressional/Parliamentary Dialogue on the Great Lakes. The Great Lakes Commission co-sponsors this event and, on behalf of the Panel, can help ensure that ANS issues are addressed and included in any "action agenda" that might result. The Dialogues, held in Washington D.C. every few

years since 1985, typically attract 8-12 members of Congress and Parliament with environmental/resource management responsibilities.

2) Seeking a Congressional hearing on ANS issues. Working with appropriate members of the Great Lakes Congressional Delegation and members of the relevant committees, the Panel can request a hearing on aquatic nuisance species issues, either Great Lakes specific or national in scope. Testimony would reflect Panel recommendations in all areas of its responsibility, and would be widely disseminated.

3) Briefing Congressional staff. Convene key Congressional staff for one or more briefings directed at Panel recommendations on legislative, program and budget needs. This can encourage interaction between individual Panel members and Congressional staff, and formalize a communications link to ensure that staff members fully utilize Panel/regional information on a continuing basis.

4) Building coalitions at the national level. Identify various professional, trade and related associations that might engage cooperatively in information/education activities directed at Congressional and Administrative officials. This might include, for example, the American Fisheries Society, the American Water Works Association, sport fishing councils and other such groups. This can be accomplished in various ways, including a Panel sponsored meeting to which such groups are invited; presentations by a Panel member to meetings of these groups; direct one-on-one contact; or combinations of the above.

Much of this activity can be facilitated by the Great Lakes Commission, with the assistance of its Great Lakes Washington Office.

Activity: Annual Report of the Great Lakes Panel on Aquatic Nuisance Species. Design, print and distribute an Annual Report, as called for in the federal Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990. Carefully targeted presentations, most notably to the national Aquatic Nuisance Species Task Force, will be useful in highlighting legislative program and budgetary needs determined via deliberations of the Panel membership.

Goal IV: The availability of adequate resources to implement the Great Lakes Panel's *Information/Education Strategy for Aquatic Nuisance Prevention and Control.*

Problem: *Funding is not being appropriated for implementation of the I/E strategy through the Aquatic Nuisance Prevention and Control Act.*

Objective: Support efforts to facilitate Congressional appropriation of funds, authorized in the ANS Act, to implement the I/E strategy.

Activity: Inform ANS Task Force, Congress, and relevant federal agencies of I/E strategy funding needs. Through briefings, prepared materials and inquiry responses as appropriate, ensure that policy leaders are informed of I/E plans, associated benefits, and funding requirements that might be addressed via the Aquatic Nuisance Prevention and Control Act.

Problem: *Agency resources are not adequate to support the I/E strategy.*

Objective: Support efforts to ensure that state and federal agencies, with responsibility to minimize ANS impacts, allocate both financial resources and/or in-kind services to implement portions of the Great Lakes Panel I/E strategy.

Activity: Collaborative arrangements for I/E strategy implementation among relevant state and federal agencies. Under Great Lakes Panel leadership, identify for each I/E strategy element prospective agency collaborators. In consultation with those collaborators, develop a scope of work for each activity that maximizes access to available financial resources and/or in-kind contributions.

Problem: *A comprehensive search for available funding from private sector sources has not been pursued to implement the I/E strategy.*

Objective: Provide a mechanism to facilitate private funding to support implementation of the I/E strategy.

Activity: Private sector development program. Develop and implement a fund-raising strategy targeted to private business and organizations (i.e. lake associations) concerned with ANS issues for the support of public awareness programs.

APPENDIX B

Section 1204 of the *Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990*

Public Law 101-646
101st Congress

An Act

To prevent and control infestations of the coastal inland waters of the United States by the zebra mussel and other nonindigenous aquatic nuisance species, to reauthorize the National Sea Grant College Program, and for other purposes.

Nov. 29, 1990
[H.R. 5390]

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

Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990.

"TITLE I—AQUATIC NUISANCE PREVENTION AND CONTROL

Subtitle A—General Provisions

"SECTION 1001. SHORT TITLE.

16 USC 4701 note.

"This title may be cited as the "Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990".

"SEC. 1002. FINDINGS AND PURPOSES.

16 USC 4701.

"(a) FINDINGS.—The Congress finds that—

"(1) the discharge of untreated water in the ballast tanks of vessels and through other means results in unintentional introductions of nonindigenous species to fresh, brackish, and saltwater environments;

"(2) when environmental conditions are favorable, nonindigenous species, such as the zebra mussel (Dreissena polymorpha), become established and may disrupt the aquatic environment and economy of affected coastal areas;

"(3) the zebra mussel was unintentionally introduced into the Great Lakes and, if left uncontrolled, is expected to infest over two-thirds of the continental United States through the unintentional transportation of larvae and adults by vessels operating in inland waters; and

"(4) the potential economic disruption to communities affected by the zebra mussel due to its colonization of water pipes, boat hulls and other hard surfaces has been estimated at $5,000,000,000 by the year 2000, and the potential disruption to the diversity and abundance of native fish and other species could be severe.

"(b) PURPOSES.—The purposes of this Act are—

"(1) to prevent unintentional introduction and dispersal of nonindigenous species into waters of the United States through ballast water management and other requirements;

"(2) to coordinate federally conducted, funded or authorized research, prevention control, information dissemination and other activities regarding the zebra mussel and other aquatic nuisance species;

"(3) to develop and carry out environmentally sound control methods to prevent, monitor and control unintentional

"(c) CANADIAN PARTICIPATION.—The panel convened under this section is encourage to invite representatives from the Federal, provincial or territorial governments of Canada to participate as observers.

16 USC 4724.

"SEC. 1204. STATE AQUATIC NUISANCE SPECIES MANAGEMENT PLANS.

"(a) STATE PLAN.—

"(1) IN GENERAL.—The Governor of each State may, after notice and opportunity for public comment, prepare and submit—

"(A) a comprehensive management plan to the Task Force for approval which identifies those areas or activities within the State, other than those related to public facilities, for which technical and financial assistance is needed to eliminate or reduce the environmental, public health, and safety risks associated with aquatic nuisance species, particularly the zebra mussel; and

"(B) a public facility management plan to the Assistant Secretary for approval which is limited solely to identifying those public facilities within the State for which technical and financial assistance is needed to reduce infestations of zebra mussels.

"(2) CONTENT.—Each plan shall, to the extent possible, identify the management practices and measures that will be undertaken to reduce infestations of aquatic nuisance species. Each plan shall—

"(A) identify and describe State and local programs for environmentally sound prevention and control of the target aquatic nuisance species;

"(B) identify Federal activities that may be needed for environmentally sound prevention and control of aquatic nuisance species and a description of the manner in which those activities should be coordinated with State and local government activities; and

"(C) a schedule of implementing the plan, including a schedule of annual objectives.

"(3) CONSULTATION.—

"(A) In developing and implementing a management plan, the State should, to the maximum extent practicable, involve local governments and regional entities, and public and private organizations that have expertise in the control of aquatic nuisance species.

"(B) Upon the request of a State, the Task Force or the Assistant Secretary, as appropriate under paragraph (1), may provide technical assistance in developing and implementing a management plan.

"(4) PLAN APPROVAL.—Within 90 days after the submission of a management plan, the Task Force or the Assistant Secretary in consultation with the Task Force, as appropriate under paragraph (1), shall review the proposed plan and approve it if it meets the requirements of this subsection or return the plan to the Governor with recommended modifications.

"(b) GRANT PROGRAM.—

"(1) STATE GRANTS.—The Director or the Assistant Secretary, as appropriate under subsection (a), may, at the recommendation of the Task Force, make grants to States with approved management plans for the implementation of those plans.

"(2) APPLICATION.—An application for a grant under this subsection shall include an identification and description of the best management practices and measures which the State proposes to utilize in implementing an approved management plan with any Federal assistance to be provided under the grant.

"(3) FEDERAL SHARE.—

"(A) The Federal share of the cost of each comprehensive management plan implemented with Federal assistance under this section in any fiscal year shall not exceed 75 percent of the cost incurred by the State in implementing such management program and the non-Federal share of such costs shall be provided from non-Federal sources.

"(B) The Federal share of the cost of each public facility management plan implemented with Federal assistance under this section in any fiscal year shall not exceed 50 percent of the cost incurred by the State in implementing such management program and the non-Federal share of such costs shall be provided from non-Federal sources.

"(4) ADMINISRATIVE COSTS.—For the purposes of this section, administrative costs for activities and programs carried out with a grant in any fiscal year shall not exceed 5 percent of the amount of the grant in that year.

"(5) IN-KIND CONTRIBUTIONS.—In addition to cash outlays and payments, in-kind contributions of property or personnel services by non-Federal interests for activities under this section may be used for the non-Federal share of the cost of those activities.

"SEC. 1205. RELATIONSHIP TO OTHER LAWS. 16 USC 4725.

"All actions taken by Federal agencies in implementing the provisions of section 1202 shall be consistent with all applicable Federal, State, and local environmental laws. Nothing in this title shall affect the authority of any State or political subdivision thereof to adopt or enforce control measures for aquatic nuisance species, or diminish or affect the jurisdiction of any State over species of fish and wildlife. Compliance with the control and eradication measures of any State or political subdivision thereof regarding aquatic nuisance species shall not relieve any person of the obligation to comply with the provisions of this subtitle.

"SEC. 1206. INTERNATIONAL COOPERATION. 16 USC 4726.

"(a) ADVICE.—The Task Force shall provide timely advice to the Secretary of State concerning aquatic nuisance species that infest waters shared with other countries.

"(b) NEGOTIATIONS.—The Secretary of State, in consultation with the Task Force, is encouraged to initiate negotiations with the governments of foreign countries concerning the planning and implementation of prevention, monitoring, research, education, and control programs related to aquatic nuisance species infesting shared water resources.

"SEC. 1207. INTENTIONAL INTRODUCTIONS POLICY REVIEW. Reports. 16 USC 4727.

"Within one year of the date of enactment of this Act, the Task Force shall, in consultation with State fish and wildlife agencies, other regional, State and local entities, potentially affected industries and other interested parties, identify and evaluate approaches for reducing the risk of adverse consequences associated with inten-

APPENDIX C

Federal Consistency Requirements

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
OFFICE OF OCEAN AND COASTAL RESOURCE MANAGEMENT
Silver Spring, Maryland 20910

JUL 19 1995

FEDERAL CONSISTENCY REQUIREMENTS*

Introduction

What is Federal Consistency?

Congress passed the Coastal Zone Management Act ("CZMA") to assist coastal states, Great Lake states, and United States territories to develop state coastal management programs to comprehensively manage and balance competing uses of and impacts to coastal resources. Federal consistency is the CZMA requirement that federal actions that are reasonably likely to affect any land or water use or natural resource of the coastal zone be consistent with the enforceable policies of a coastal state's or territory's federally approved coastal management program ("state CMP" or "CMP"). A state CMP reviews the federal action to determine if the proposed action will be consistent with the CMP. Federal consistency reviews are the responsibility of the lead state CMP agency. At the federal level, the National Oceanic and Atmospheric Administration ("NOAA") oversees the CMPs' use of consistency; advocates, when appropriate, state positions with other federal agencies; provides states, and federal agencies with technical assistance; mediates consistency disputes between states and federal agencies; and processes appeals to the Secretary of Commerce.

Federal actions include:

1. Direct federal actions -- Activities and development projects performed by a federal agency, or a contractor for the benefit of a federal agency.

   E.g., activities in National Parks such as installation of mooring buoys or road construction, Fisheries Management Plans by the National Marine Fisheries Service, Naval exercises, the disposal of surplus federal land by the General Services Administration, a U.S. Army Corps of Engineers ("Corps") breakwater or beach renourishment project, an outer continental shelf ("OCS") oil and gas lease sale by the Minerals Management Service ("MMS"), improvements to a military base, Naval disposal of radioactive or hazardous waste performed by a private contractor, etc.;

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* For further information contact David W. Kaiser, Federal Consistency Coordinator, Office of Ocean and Coastal Resource Management, NOAA, 1305 East-West Highway, 11th Floor, Silver Spring, MD 20910. Phone: 301.713.3098 ext 144. Fax: 301.713.4367. Internet: Dkaiser@Coasts.NOS.NOAA.GOV

2. Indirect federal actions -- Activities not performed by a federal agency, but requiring federal permits or licenses or other forms of federal approval.

   E.g., activities requiring Corps 404 permits, Interstate Commerce Commission water carrier licenses, MMS licenses for OCS exploration, development and production, Corps permits for use of ocean dump-sites, Nuclear Regulatory Commission licenses for nuclear power plants, etc.;

3. Federal financial assistance to states and territories and local governments.

   E.g., Federal Highway Administration funds to state and territory and local governments, construction grants for wastewater treatment works, hazardous waste management trust fund, Housing and Urban Development grants, etc.

The Coastal Zone Act Reauthorization Amendments of 1990 ("CZARA") amended the CZMA to clarify that federal consistency applies when any federal activity, regardless of location, affects any land or water use or natural resource of the coastal zone. Section 307(c)(1)(A) of the CZMA, 16 U.S.C. § 1456(c)(1)(A), now provides:

> Each Federal agency activity within or outside the coastal zone that affects any land or water use or natural resource of the coastal zone shall be carried out in a manner which is consistent to the maximum extent practicable with the enforceable policies of approved State management programs. A Federal agency activity shall be subject to this paragraph unless it is subject to paragraph (2) or (3).

This new "effects" language was added by CZARA, to replace previous language that referred to activities "directly affecting the coastal zone." It also reflects Congressional intent to overturn Secretary of the Interior v. California, 464 U.S. 312 (1984), and further to:

> establish[] a generally applicable rule of law that any federal agency activity (regardless of its location) is subject to [the consistency requirement] if it will affect any natural resources, land uses, or water uses in the coastal zone. No federal agency activities are categorically exempt from this requirement.

H.R. Conf. Rep. No. 964, 101st Cong., 2d Sess., 968 - 975, 970 [hereinafter Conference Report].

The Conference Report on the 1990 amendments provides further clarification as follows:

> The question of whether a specific federal agency activity may affect any natural resource, land use, or water use in the coastal zone is determined by the federal agency. The conferees intend this determination to include effects in the coastal zone which the federal agency may reasonably anticipate as a result of its action, including

> cumulative and secondary effects. Therefore, the term "affecting" is to be construed broadly, including direct effects which are caused by the activity and occur at the same time and place, and indirect effects which may be caused by the activity and are later in time or farther removed in distance, but are still reasonably foreseeable.

Id. at 970-71.

These changes reflect an unambiguous Congressional intent to eliminate any "categorical exemptions" from CZMA consistency review, and instead to establish a uniform threshold standard requiring federal agencies to make a case-by-case factual determination of reasonably foreseeable effects on the coastal zone. The amendments to section 307(c)(1) were intended to leave no doubt that all federal agency activities meeting the "effects" standard are subject to the CZMA consistency requirement; that there are no exceptions or exclusions from the requirement as a matter of law; and that the new "uniform threshold standard" requires a factual determination, based on the effects of such activities on the coastal zone, to be applied on a case-by-case basis. Id. at 970-71; 136 Cong. Rec. H 8076 (Sep. 26, 1990).[1]

Why is Federal Consistency Important?

The federal consistency requirement addresses the need for federal actions to adequately consider state and territorial CMPs. It is an important mandatory, but flexible, mechanism to resolve potential conflicts between states, territories and federal agencies, by fostering early consultation, cooperation, and coordination.

Federal consistency is more than just a procedural dictate. It is a method of ensuring greater protection of coastal resources through the coastal management policies of states and territories by assisting states in managing coastal uses and resources. In addition, the scope of the federal consistency "effects test" can help protect entire ecosystems as well as individual resources and uses. (The "effects test" is that a federal action is subject to federal consistency if the action is reasonably likely to affect any land or water use or natural resource of the coastal zone.) For example, if an activity is occurring outside the coastal zone, e.g., outside a coastal state's territorial waters or inland coastal zone boundary, but will affect coastal water quality, habitat, wetlands, etc., and that activity has some form of federal action, then it is potentially subject to the federal consistency requirement and state coastal management policies.

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[1] The current federal consistency regulations, 15 C.F.R. Part 930, are still authoritative to the extent they are consistent with CZARA. For example, "directly affect the coastal zone" in the regulations should be read as "affecting any land or water use or natural resource of the coastal zone," and the federal agencies' determination of effects should include direct, indirect, cumulative, secondary, and reasonably foreseeable effects.

How does Federal Consistency Benefit Coastal States and Territories?

In addition to the general benefits noted above -- coordination, cooperation, effective application of state coastal policies, greater resource protection -- federal consistency is a powerful tool states and territories can use to reach most federal actions affecting the coastal zone. It is based on effects and not geographic boundaries and there are no categorical exemptions from the consistency requirement.

However, maximizing the benefits of federal consistency requires that federal agencies provide routine notification to coastal states of actions, permits, and financial assistance; and requires coastal states to pay regular attention to proposed federal actions, develop adequate consistency procedures, and notify federal agencies, other state agencies, and others of a state's assertion of consistency. If a CMP is not receiving notice of all federal activities affecting the coastal zone, then the CMP needs to address this issue with each federal agency: the CMP needs to make connections with the federal agencies, inform them of the federal consistency requirements, possibly develop MOUs, ensure that the CMP obtains notice, and regularly respond when the CMP does receive notice. In essence, federal agencies and others have an affirmative duty to comply with the federal consistency requirements, but CMPs need to take regular, consistent, and assertive steps.

The successful use of consistency by states is due, in large part, to the regular and consistent use of consistency. Examples include:

California - California is one of the coastal states that is well known for its use of consistency. California has used consistency to address the impact of Area Contingency Plans and Vessel Response Plans required by the Oil Pollution Act of 1990 ("OPA"). California felt that the OPA process would not adequately protect certain areas of the coast from an oil spill and has asserted consistency to address its concerns. California also used consistency to ensure that the closure and re-use of a large military base addressed coastal protection and recreation policies. California has also used consistency to address the impacts from commercial spaceflights on beach access, ocean acoustical experiments on marine mammals, artificial reef construction on existing habitat and ecology, etc.

Massachusetts - Massachusetts has used consistency to make significant changes in a large ocean dump-site designation by the Environmental Protection Agency, and a sewer outfall located in the neighboring state of New Hampshire that would impact Massachusetts beaches. Massachusetts also used consistency to great success when the General Services Administration ("GSA") proposed to acquire property along the Boston waterfront for a new federal courthouse. As a result of the consistency process, GSA and the state CMP negotiated a redesigned courthouse with a host of public amenities and the courthouse now has tremendous public and state support.

North Carolina - North Carolina regularly uses consistency to review activities on federal land, such as military exercises, and alteration of National Wildlife Refuges. North

Carolina, California, Alaska, Florida, Louisiana, also regularly use consistency to address effects from OCS oil and gas activities.

How does Federal Consistency Benefit Federal Agencies?

Federal consistency provides federal agencies with an effective mechanism to document coastal effects and to address state and territorial coastal management concerns. Early attention to the federal consistency requirement often provides the federal agency with CMP and public support and a smooth and expeditious federal consistency review. At the same time, federal consistency ensures that federal agency missions and requirements are satisfied.

Early consultation and cooperation between federal agencies and CMPs helps federal agencies avoid costly last minute changes to projects in order to comply with state CMP policies. For example, to make full use of consistency's flexible procedures and the need for early coordination, Alaska and the Department of the Interior's Mineral Management Service developed a memorandum of understanding that specifies the process for consistency reviews of OCS oil and gas lease sales and approvals.

What are the Basic Federal Consistency Procedures?

Direct Federal Activities and Development Projects

1. Federal agency determines if federal activity is reasonably likely to affect any land or water use or natural resource of the coastal zone.
2. If effects, then federal agency submits a consistency determination to state CMP at least 90 days before activity starts.
3. State CMP has 45 days (plus appropriate extensions) to agree or disagree with the federal agency's consistency determination.
4. State waives consistency rights if state CMP does not meet timeframes.
5. State CMP must either agree or disagree.
6. If dispute between federal agency and state CMP, either party may seek Secretarial mediation or informal OCRM negotiation.

Federal License and Permit Activities

1. State CMP, or OCRM, determines effects:
   a. listed v. unlisted activity.
   b. Inside v. outside coastal zone.
2. Applicant for any required federal approval must submit a certification and necessary data and information to the state CMP.
3. State CMP has six months to respond, but must notify applicant if review will go beyond three months.
4. State CMP must either concur or object with applicant's certification.

5. Federal agency cannot issue approval until state CMP concurs.
6. Applicant may appeal state CMP's objection to the Secretary of Commerce.

OCS Permits or Licenses

1. Like Permits or Licenses for the most part.

Federal Financial Assistance Activities

1. State or local government applies for federal financial assistance.
2. Listed v. unlisted activity.
3. Follow state clearinghouse procedures.

See Appendix A of the Federal Consistency Requirements for a chart summary of the consistency requirements.

General Federal Consistency Procedures

This section provides a general discussion of the various federal consistency requirements and procedures. Two important things to keep in mind to facilitate consistency reviews is for the federal agency, state CMP, and applicant to discuss a proposed activity as early in the process as possible, and that state CMPs and federal agencies can agree, at any time, to more flexible consistency review procedures (providing public participation requirements are still met).

Direct Federal Agency Activities

Federal agencies proposing an activity need to follow the requirements of CZMA section 307(c)(1), (2)(16 U.S.C. § 1456(c)(1), (2)) and 15 C.F.R. Part 930, Subpart C.

Federal agencies proposing activities, whether within or outside the coastal zone, must first determine if the activity is reasonably likely to affect any land or water use or natural resource of a state's coastal zone. Effects include cumulative and secondary effects. If such effects are reasonably foreseeable then the federal agency must submit a consistency determination to the affected state(s) no later than 90 days before final federal action on the proposed activity. The federal consistency trigger is reasonably foreseeable effects, regardless of the location of the activity. If the federal agency determines that an activity is not reasonably likely to affect coastal uses or resource then the federal agency must determine whether to provide the state CMP with a "negative determination" at least 90 days prior to the federal action. See 15 C.F.R. § 930.35(d).

The federal agency should contact the state CMP at the earliest possible moment in the planning of the activity to ensure early state and federal coordination and consultation. Early consultation with state CMPs will reduce potential conflicts as the activity moves forward.

Once the federal agency has determined that effects are reasonably foreseeable, the federal activity must be conducted in a manner that is "consistent to the maximum extent practicable" with the enforceable policies of a state's CMP.

There is no categorical exemption for any federal activity. If a federal activity is likely to affect coastal uses or resources then consistency applies. However, the President may exempt a specific federal activity (but not a class of federal activities) under certain circumstances. In addition, as indicated above, a federal activity affecting the coastal zone must be consistent to the maximum extent practicable. This requires federal activities to be fully consistent with state CMPs unless compliance is prohibited based upon the requirements of existing law applicable to the federal agency's operations. Thus, a federal activity may deviate from full consistency if legally required (as opposed to a general notion or claim of national security). Finally, federal agencies may deviate from full consistency with an approved program when such deviation is justified because some unforeseen circumstances, i.e., an emergency situation, arising after the approval of the management program present the federal agency with a substantial obstacle that prevents complete adherence to the approved program.

While the form of the consistency determination may vary, it must include a detailed description of the proposed activity, its expected effects upon the land or water uses or natural resources of the state's coastal zone, and an evaluation of the proposed activity in light of the applicable enforceable policies in the state's CMP.

More specifically, the consistency determination should state, generally, the enforceable statutory provisions and regulations of the state's CMP; detail the analysis by which the federal agency has determined that its project is consistent to the maximum extent practicable with the relevant enforceable policies of the state CMPs; provide an analysis of effects on the land or water uses or natural resources of the state's coastal zone (or reference pages of NEPA document if appropriate); provide information, data and analysis supporting the determination of consistency with the CMP; notify the state CMP that it has 45 days (plus any appropriate extension) from receipt of the determination (and data and information sufficient to support the determination) in which to agree or disagree with the determination.

States are encouraged to list those activities that are likely to affect coastal uses or resources in the approved CMP, and to monitor unlisted activities and to notify federal agencies when an unlisted activity requires consistency review. 15 C.F.R. § 930.35(a), (b). However, the listing/unlisted provisions in paragraphs (a) and (b) simply represent recommended procedures for facilitating state CMP review of federal activities which are reasonably likely to affect any land or water use or natural resource of the coastal zone. Whether adopted in full, in part, or not at all by federal and state CMPs the responsibility of federal agencies to provide state CMPs with information regarding all federal activities affecting the coastal zone continues to apply. Accordingly, the failure of a state CMP to either list or monitor federal activities does not remove the requirement for federal agencies to provide state CMPs with

consistency determinations when the federal agency independently concludes that the proposed activity will affect coastal uses or resources.

If the state CMP agrees with the determination, the federal agency may immediately proceed with the activity. (federal agencies make a "determination" of consistency with state CMPs for which a state either "agrees" or "disagrees." Applicants for federal approvals and funding make a "certification" that the activity will be conducted in a consistent manner for which the state CMP either concurs or objects.) If the state disagrees with the consistency determination, the state's disagreement must describe how the proposed activity is inconsistent with enforceable CMP policies, and alternative measures (if they exist) that would allow the activity to be conducted in a manner consistent to the maximum extent practicable. In the event of a disagreement the state CMP and federal agency should attempt to resolve any differences during the remainder of the 90 day period. If resolution has not been reached at the end of the 90 day period the federal agency should consider postponing final federal action until the problems have been resolved. However, at the end of the 90 day period the federal agency may, notwithstanding state CMP disagreement, proceed with the activity. If the federal agency proceeds with the activity over a state CMP's disagreement, the federal agency must clearly describe to the state CMP the specific legal authority which limits the federal agency's discretion to comply with the state CMP's enforceable policies. 15 C.F.R. § 930.32(a). Either party may seek non-binding formal Secretarial mediation or informal negotiation through OCRM.

Non-Federal Activities Requiring a Federal License or Permit

A private individual or business, or a state or local government agency, or any other type of non-federal entity, applying to the federal government for a required permit or license or any other type of an approval or authorization, needs to follow the requirements of CZMA section 307(c)(3)(A)(16 U.S.C. § 1456(c)(3)(A)) and 15 C.F.R. Part 930, Subpart D.

Applicants for federal licenses, permits, or other approvals, must certify to the state CMP that the proposed activity, whether in or outside the coastal zone, affecting any land or water use or natural resource of the coastal zone, will be conducted in a manner that is consistent with the enforceable policies of the CMP. All federal license or permit activities occurring in the coastal zone are deemed reasonably likely to affect coastal uses or resources, if the state CMP has "listed" the particular federal license, permit, or approval in its coastal management program document. (The listing of federal licenses and permits in a state's CMP provides notice to federal agencies and applicants for federal approvals that activities requiring such approvals can be reasonably expected to affect the coastal zone and must therefore be conducted in a manner that is consistent with the enforceable policies of a state's CMP.)

For a listed activity occurring in the coastal zone, the applicant must submit a CZMA federal consistency certification to the approving federal agency and the state CMP. In addition to the certification, the applicant must provide the state with the necessary data and information

to allow the state to assess the project's effects. This information will normally be contained in the applicant's application to the federal agency, but may include other information required by the state CMP, e.g., necessary state permits. The state's review time starts when the state receives the certification and necessary data and information. The state CMP has six months from the receipt of the certification and necessary data and information in which to complete its review. If a state concurs with an applicant's certification then the federal agency may issue its approval. If the state has not responded within the six months then the state's concurrence is presumed. If the state objects the federal agency may not issue any relevant federal approvals. The federal agency may issue its licenses or approvals once the state CMP concurs, or the state's concurrence is presumed in the absence of a state objection within the six months following commencement of the state CMP's review, or where the state objects within the six months, but the Secretary of Commerce, on appeal by the applicant, overrides the state's objection.

An applicant may also be required to submit a consistency certification to the state CMP for unlisted activities. For unlisted activities, in or outside the coastal zone, the state CMP must notify the applicant, the relevant federal agency, and OCRM that it intends to review the activity. OCRM must approve the state's consistency review. The state CMP must make this notification within 30 days of receiving notice of the activity, otherwise the state waives its consistency rights. The waiver does not apply where the state CMP does not receive notice (notice may be actual or constructive so long as it is adequate). The applicant and the federal agency have 15 days from receipt of the state CMP's request to provide comments to OCRM. OCRM will make a decision usually within 30 days of receipt of the state's request. The sole basis for OCRM's decision will be whether the proposed activity can be reasonably expected to affect any land or water use or natural resource of the coastal zone. The federal agency may not approve the activity until the consistency process is complete.

Activities occurring outside the coastal zone are also subject to consistency if the state has generally described the geographic area outside the coastal zone subject to review, or if the state requests to review the activity as an unlisted activity. For listed activities, outside the coastal zone, the applicant must submit a consistency certification to the state CMP and the federal agency if the activity falls within the geographic area defined by the state for listed activities outside the coastal zone. The applicant should notify the state CMP and determine if this is the case. For listed activities outside the coastal zone where the state has not defined the geographic area, the state CMP may follow the unlisted activity procedure described above.

Outer Continental Shelf Exploration, Development, and Production Activities

A private person or business applying to the federal government for outer continental shelf (OCS) exploration, development and production activities needs to follow the requirements of CZMA section 307(c)(3)(B)(16 U.S.C. § 1456(c)(3)(B)) and 15 C.F.R. Part 930, Subpart E.

Any person who submits to the Department of the Interior an OCS plan for the exploration of, or development of, or production from, any area leased under the Outer Continental Shelf Lands Act, must certify to the relevant state CMPs that any activities proposed in such OCS plans will be conducted in a manner consistent with the state CMPs. The process and requirements for this section generally mirror those of federal license or permit activities discussed above.

Federal Assistance to State and Local Governments

A state or local government agency applying for federal financial assistance needs to follow the requirements of CZMA section 307(d)(16 U.S.C. § 1456(d)) and 15 C.F.R. Part 930, Subpart F.

Any state or local government applying for any form of federal financial assistance for an activity reasonably likely to affect any land or water use or natural resource of the coastal zone must certify to the state CMP that the activity will be conducted in a manner consistent with the state CMP. The federal agency may not grant any federal assistance until the state CMP concurs.

NOAA regulations allow state CMPs to develop flexible procedures for reviewing and concurring with federal assistance activities. State CMP review of the activities is normally conducted through procedures established by states pursuant to Executive Order 12372 -- intergovernmental review of federal programs. While state CMPs should develop lists of the federal assistance programs subject to consistency review, the exclusion from a state CMP's list of a particular federal funding program does not relieve the state agency or local government applicant from complying with federal consistency requirements if the activity to be funded can be reasonably expected to affect any land or water use or natural resource of the coastal zone.

Secretarial Mediation of Disputes

In the event of a serious disagreement between a state CMP and a federal agency over any aspect of the federal consistency requirement, either party may request that the Secretary of Commerce mediate the dispute. All parties must agree to participate in the mediation, but agreement to participate is non-binding and either party may withdraw from the mediation at any time. Secretarial mediation is a formal process that includes a public hearing, submission of written information, and meetings between the parties, upon which a hearing officer, appointed by the Secretary, will propose a solution.

Secretarial mediation may be used for disputes under any of the four consistency review types: direct federal activities, federal license or permit activities, OCS license and permit activities, and federal assistance activities. However, the request can only be made by the head of a federal agency or the Governor of a state or the designated state CMP agency. Exhaustion of the mediation process is not a prerequisite to judicial review.

Informal Negotiation of Disputes

The availability of formal Secretarial mediation or litigation does not preclude the parties from informally negotiating the dispute through OCRM or another facilitator. OCRM has successfully filled this role of informal negotiator and offers its good offices to resolve conflicts. In fact most disputes are addressed through this informal method. Either party may request OCRM involvement, and of course participation is non-binding.

Appeals to the Secretary of Commerce

The federal consistency provisions provide an administrative appeal to the Secretary of Commerce from a consistency objection by a coastal state. In the case of a federal license or permit, an outer continental shelf exploration or development plan, or an application for federal financial assistance, the applicant may request that the Secretary override the state's consistency objection if the activity is consistent with the objectives of the CZMA (Ground I), or is otherwise necessary in the interest of national security (Ground II). 16 U.S.C. § 1456(c)(3)(A),(B), and (d).

If the requirements of either Ground I or Ground II are met, the Secretary must override the state's objection. The inquiry by the Secretary into whether the grounds for an override have been met is based upon an administrative record developed for the appeal. While the Secretary will review the state objection for compliance with the CZMA and the implementing regulations, e.g., whether the objection is based on enforceable policies, the Secretary does not review the objection for compliance with state laws and policies.

There are four elements at 15 C.F.R. § 930.121 that an appellant must meet in order to satisfy the first ground for a Secretarial override, "consistent with the objectives of the CZMA:"

> (1) the activity furthers one or more of the competing national objectives or purposes contained in sections 302 or 303 of the CZMA;
>
> (2) when performed separately or when its cumulative effects are considered, the activity will not cause adverse effects on the natural resources of the coastal zone substantial enough to outweigh its contribution to the national interest;
>
> (3) the activity will not violate any requirements of the Clean Air Act, as amended, or the Federal Water Pollution Control Act, as amended, and
>
> (4) there is no reasonable alternative available (e.g., location, design, etc.) which would permit the activity to be conducted in a manner consistent with the management program.

Federal consistency regulations also address the second ground for a Secretarial override, "necessary in the national security." The term "necessary in the interest of national security" describes a federal license or permit activity, or a federal assistance activity which, although inconsistent with a state's management program, is found by the Secretary to be permissible because a national defense or other national security interest would be significantly impaired if the activity were not permitted to go forward as proposed.

If the Secretary overrides the state's objection the authorizing federal agency may permit or fund the activity. A secretarial override does not obviate the need for an applicant to obtain any state required permits or authorizations. The appeal process is flexible and normally takes one to two years. Factors influencing the appeal process time include: nature and complexity of the dispute, stays, public hearings, and briefing schedules.

See Appendix B of the Federal Consistency Requirements, for a list of CZMA Secretarial override decisions and decisions on OCS activities.

APPENDIX D

Project Oversight Committee Members
Aquatic Nuisance Species and Coastal Management Programs: Toward a Regional Strategy in the Great Lakes Basin

AQUATIC NUISANCE SPECIES AND COASTAL MANAGEMENT PROGRAMS: TOWARD A REGIONAL STRATEGY IN THE GREAT LAKES BASIN

Project Oversight Committee Members

Mark Coscarelli, Michigan Department of Natural Resources
Catherine Cunningham, Michigan Coastal Management Program
Michael J. Donahue, Great Lakes Commission
Gary Isbell, Ohio Department of Natural Resources
Christine Kasselmann, Ohio Coastal Management Program
Ron Martin, Wisconsin Department of Natural Resources
Jay Rendall, Minnesota Department of Natural Resources
Steve Ressler, New York State Coastal Management Program
John Schwartz, Michigan Sea Grant College Program
Chris Shafer, Michigan Coastal Management Program
Tim Sinnott, New York State Department of Environmental Conservation
Jay Troxel, United States Fish and Wildlife Service

Staff support provided by Kathe Glassner-Shwayder, Great Lakes Commission and Lori Reynolds, Great Lakes Commission

APPENDIX E

Workshop Participants

Aquatic Nuisance Species and Coastal Management Programs: Toward a Regional Strategy in the Great Lakes Basin

AQUATIC NUISANCE SPECIES AND COASTAL MANAGEMENT PROGRAMS: TOWARD A REGIONAL STRATEGY IN THE GREAT LAKES BASIN
ANN ARBOR, MICHIGAN
MAY 2-3, 1995

Workshop Participants

Mary Bielen, Agent
Sea Grant Extension Office
One Maritime Plaza
Toledo, OH 43604-1866
419/249-6554
419/243-1835

K. Douglas Blodgett, Research Biologist
Illinois Natural History Survey
704 N. Schrader Ave.
Havana, IL 62644
309/543-6000
309/543-2105

Charles Boydstun, Ecologist
National Biological Service
7920 NW 71st Street
Gainsville, Florida 32653
904-378-81816
904-378-4956

Ellen Brody, Acting Great Lakes Regional Manager
NOAA, Office of Ocean and Coastal Resource Management
1305 East-West Highway
SSMC4 Rm 11241
Silver Spring, MD 20910
301/713-3113
301/713-4367

Jeffrey Busch, Executive Director
Lake Erie Office, Ohio Lake Erie Commission
One Maritime Plaza
Toledo, OH 43604-1866
419/245-2514
419/245-2519

Thomas R. Busiahn, Project Leader
Fishery Resources Office
U.S. Fish & Wildlife Service
2800 Lake Shore Drive East
Ashland, WI 54806
715/682-6185
715/682-8899

Allegra Cangelosi, Senior Policy Analyst
Northeast-Midwest Institute
218 D. St., SE
Washington, D.C. 20003
202/544-7494
202/544-0043

Dr. James Carlton, Director of Maritime Studies Program
Williams College-Mystic Seaport
P.O. Box 6000
50 Greenmanville Ave.
Mystic, CT 06355
203/572-5359
203/572-5359

Ann Conrad, Program Director
Freshwater Foundation
Spring Hill Center
725 County Rd. 6
Wayzata, MN 55391
612/449-0092;612/449-0592

Mark Coscarelli, Policy Specialist
Office of the Great Lakes
Michigan DNR
P.O. Box 30028
Lansing, MI 48909
517/373-3588
517/353-4053

Tom Crane, Program Manager
Great Lakes Commission
Argus II Building
400 Fourth Street
Ann Arbor, Michigan 48103
313-665-9135
313-665-4370

Catherine Cunningham
Land & Water Mgmt. Analyst
Michigan Coastal Management Program
P.O. Box 30458
Lansing, MI 48909
517/373-1950
517/335-3451

Al Dextrase
Ontario Ministry of Natural Resources
Box 7000
Peterborough, ONT K9J 8M5
705/740-1532
705/740-1536

Barbara Doll
Coastal Water Quality Specialist
N.C. Sea Grant College Program
Box 8208
N.C. State University
Raleigh, NC 27695
919-515-5287

Michael Donahue, Executive Director
Great Lakes Commission
Argus II Building
400 Fourth Street
Ann Arbor, Michigan 48103
313-665-9135
313-665-4370

Jim Falk, Marine Advisory Specialist
Delaware Sea Grant
700 Pilottown Road
Lewes, DE 19958
0302/645-4235
302/645-4007

Mary Frazer, Federal Consistency Coordinator
Wisconsin Coastal Mgmt. Program
P.O. Box 7868
Madison, WI 53707-7868
608/266-8269
608/267-6931

David Garton, Associate Professor
I.U.-Kokomo
Dept. of Biological and Physical Science
2300 S. Washington St.
Kokomo, IN 46904
317/455-9244
317/455-9528

Kathe Glassner-Shwayder, Project Manager
Great Lakes Commission
Argus II Building
400 Fourth Street
Ann Arbor, Michigan 48103
313-665-9135
313-665-4370

Cynthia Hagley, Environmental Quality Educator
Minnesota Sea Grant Extension
2305 E. 5th St.
Duluth, MN 55812
218/726-8713
218/726-6556

Nils Halker, Programs Biologist
Gray Freshwater Foundation
2500 Shadywood Road
Navarre, MN 55331
612-471-9773
612-471-7685

Rick Harkins, Vice President--Operations
Lake Carriers Association
915 Rockefeller Building
614 Superior Ave. West
Cleveland, OH 44113
216/861-0591
216/241-8262

Maran Hilgendorf, Communications Specialist
Ohio Sea Grant
The Ohio State University
1541 Research Center
1314 Kinnear Road
Columbus, OH 43212-1194
614/292-8949
614/292-4364

Rodney W. Horner, Fish Pathologist
Illinois Department of Conservation
29557-E. CR2400N
Manito, IL 61541
309/968-7531
309/968-6017

Leroy Hushak, Professor
The Ohio State University
(also affiliated with Ohio Sea Grant)
2120 Fyffe Road
Columbus, OH 43210-1066
614/292-3548
614/292-7710

Gary Isbell
Ohio DNR
1840 Belcher
Fountain Square Building
Columbus, OH 43224
614/265-6300
614/262-1143

Doug Jensen
Exotic Species Information Center Coordinator
Minnesota Sea Grant
2305 East Fifth Street
Duluth, Minnesota 55812-1445
218-726-8712
218-726-6556
djensen@mes.umn.edu

David J. Jude, Research Scientist
Center for Great Lakes & Aquatic Sciences
University of Michigan
2200 Bonisteel Blvd
Ann Arbor, MI 48109-2099
313/763-3183
313/747-2748

Christine L. Kasselmann,
Assistant Administrator
Office of Real Estate & Land Mgmt.
Ohio DNR/Coastal Management Program
Fountain Square, C-4
Columbus, OH 43224
614/265-6391
614/267-2981

Sandra M. Keppner, Exotic Species Coordinator
U.S. Fish & Wildlife Service-Lower Great Lakes Fishery Resources Office
405 North French Road
Amherst, NY 14228
716/691-5456
716/691-6154

Ron Kinnunen, Dist. Ext. Sea Grant Agent
Michigan Sea Grant College Program
Michigan State University Extension
1030 Wright Street
Marquette, MI 49855
906/228-4830
906/228-4572

Mike Klepinger, Extension Associate
Michigan Sea Grant College Program
Michigan State University
334 Natural Resources Building
East Lansing, MI 48824-1222
517/353-5508
517/353-6496

Karen Lagerberg
MSU Sea Grant
333 Clinton Street
Grand Haven, MI 49417

Randy Lang, Fisheries Program Specialist
Fisheries Program
IGCS - Rm 273W
402 W. Washington St.
Indianapolis, IN 46204
317/233-0936
317/232-8150

Paul Marangelo, Research
Associate/Graduate Student
Mystic Seaport Museum/U of M
1859 Shirley Lane C5
Ann Arbor, MI 48105
313/663-5827

Ron Martin
Wisconsin DNR
101 South Webster St., GEF 2
P.O. Box 7921
Madison, WI 53555
608/266-9270
608/267-2800

Jack McGriffin, Jr.
Indaina Coastal Zone Management Program
Division of Water
402 W.Washington St., Room 264
Indianapolis, IN 46204-2212

G. Tracy Mehan, Director
Office of the Great Lakes
Michigan DNR
P.O. Box 30028
Lansing, MI 48909
517/335-4056
517/335-4242

Brian Miller, Coordinator-MAS
Illinois/Indiana Sea Grant Program-Purdue
Department of Forestry and Natural
Resources
1159 Forestry Building
Purdue University
West Lafayette, IN 47907
317/494-3583
317/496-2422

Kristin Pirkola, Research Assistant
University of Michigan/Mystic Seaport
Museum
1550 Washenaw
Ann Arbor, MI 48104
313/741-0934

Commander Eric Reeves, Chief
Marine & Env. Safety Branch
Ninth Coast Guard District
1240 East Ninth Street
Cleveland, OH 44199-2060
216/522-3994
216-522-3261

Jay Rendall, Program Coordinator-Exotic Species
Minnesota DNR-Fish & Wildlife Division
500 Lafayette Rd.
St. Paul, MN 55155-4012
612/297-1464
612/297-7272

Steve Resler, Coastal Resources Specialist, Supervisor of Consistency Review
New York State Coastal Management Program-Department of State
162 Washington Street
Albany, NY 12231-0001
518/474-6000
518/473-2464

Lori Reynolds, Project Manager
Great Lakes Commission
Argus II Building
400 Fourth Street
Ann Arbor, Michigan 48103
313-665-9135
313-665-4370

Chris Shafer, Chief
Great Lakes Shorelands Section
Michigan DNR
P.O. Box 30458
Lansing, MI 48909
517/373-1950
517/335-3451

Don Schloesser, Fishery Biologist
National Biological Survey-Great Lakes
1451 Green Road
Ann Arbor, MI 48105
313/994-3331
313/994-8780

John Schwartz
Michigan Sea Grant College Program
Insitute of Water Research
334 Natural Resources Bldg.
Michigan State University
East Lansing, MI 48824-1222
517/355-9637
517/353-6496

Amy J. Shelton, Lake Michigan Lakewide Management. Plan Coordinator
Surface Water Quality Division
Michigan DNR
P.O. Box 30273
Lansing, MI 48909
517/335-1211
517/373-9958

Rick Shertzer, Chief
Quality Assessment Unit
Bureau of Water Quality Management
Pennsylvania Department of Environmental Resources
Market Street State Office Building
P.O. Box 8465
Harrisburg, PA 17105
717/783-3638
717/772-5156

Tim Sinnott, Biologist
New York Department of Environmental Conservation
Room 530
50 Wolf Rd.
Albany, NY 12233-4756
518/457-0758
518/485-8424

Nancy Taaffee, Graduate Student
Dept. of Urban & Regional Planning
University of Illinois at Urbana-Champaign
511 W. Nevada St.
Urbana, IL 61801
217/337-0392

Dan Terlizzi, Sea Grant Water Quality Specialist
c/o NOAA Chesapeake Bay Off.
410 Severn Ave., Suite 107A
Annapolis, MD 21403
410/267-5660
410/267-5666

Dan Thomas, President
Great Lakes Sport Fishing Council
P.O. Box 297
Elmhurst, IL 60126
708/941-1351
708/941-1196

William Jay Troxel, Aquatic Nuisance Species Coordinator
U.S. Fish & Wildlife Service
4401 N. Fairfax Drive
Room 840
Arlington, VA 22203
703/358-1718
703/358-2210

Hank Vanderploeg, Research Ecologist
Great Lakes Environmental Research Lab/NOAA
2205 Commonwealth
Ann Arbor, MI 48105
313/741-2284
313/741-2055

Howard Wandall, Chief
Michigan DNR
Inland Lakes & Streams Unit
P.O. Box 30458
Lansing, MI 48909
517/373-8000
517/335-4381

Dwight Williamson
Water Quality Management Section
Department of the Environment
Building 2, 139 Tuxedo Avenue
Winnipeg, MB R3N OH6
CANADA

Bernie Ylkanen, Regional Fisheries Biologist
Michigan DNR
1990 US-41 South
Marquette, MI 49855
906/228-6561
906/228-5245

APPENDIX F

Workshop Agenda
Aquatic Nuisance Species and Coastal Management Programs: Toward a Regional Strategy in the Great Lakes Basin

WORKSHOP

Aquatic Nuisance Species and Coastal Management Programs: Toward a Regional Strategy in the Great Lakes Basin
May 2: 1:00 p.m. - 5:00 p.m. and May 3: 8:30 a.m. - 5:00 p.m.

FINAL AGENDA

Tuesday, May 2

1:00 p.m.	Welcome and Introduction	**Chris Shafer**, Michigan Coastal Program
1:10 p.m.	Project Goals and Objectives	**Michael J. Donahue**, Great Lakes Commission
1:15 p.m.	Overview of Aquatic Nuisance Species and Coastal Management Programs in the Great Lakes Region	**Jay Rendall**, Minnesota DNR and **Chris Shafer**, Michigan Coastal Management Program
1:35 p.m.	*Panel I: Aquatic Nuisance Species and Coastal Management Issues and Impacts*	Moderator: **Kathe Glassner-Shwayder,** Great Lakes Commission
	The Status of Ballast Water Invasions and Management in the Great Lakes	**Dr. James Carlton,** Director of Maritime Studies and Professor of Marine Sciences, Williams College
	Regulatory Control of Nonindigenous Species in Ballast Water on Vessels Entering the Great Lakes	**Lieutenant Katherine Weathers**, U.S. Coast Guard, Assistant Chief of the Marine Port and Env. Safety Branch
	Zebra Mussel Invasion of Inland Waters of Michigan	**Paul Marangelo,** Research Associate, Mystic Seaport Museum
	The Economic Impact of Zebra Mussels on Public Facilities	**Dr. Leroy Hushak**, Research Investigator, Ohio Sea Grant
3:00 p.m.	Break	
3:15 p.m.	*Panel II: Aquatic Nuisance Species Planning Initiatives and Needs*	Moderator: **Michael Donahue**
	Federal Activities on Aquatic Nuisance Species	**Jay Troxel**, U.S. Fish and Wildlife Service / **Allegra Cangelosi**, Northeast-Midwest Institute
	New York State: Nonindigenous Aquatic Nuisance Species Comprehensive Management Plan	**Tim Sinnott**, New York Department of Environmental Conservation
	The Status of the Ruffe Control Plan	**Tom Busiahn,** U.S. Fish and Wildlife Service
	Chesapeake Bay Commission/Exotic Species Workgroup	**Dan Terlizzi**, Maryland Sea Grant

4:15 p.m.	*Panel III: Coastal Management Programs and ANS issues*	Moderator: **Chris Shafer**
	Michigan	**Catherine Cunningham,** Michigan Coastal Management Program
	Ohio	**Christine Kasselman,** Ohio Coastal Management Program
	New York	**Steve Resler,** New York Coastal Management Program
5:00 p.m.	Adjourn	
5:30 p.m.-7:00 p.m.	Reception	

Wednesday, May 3

8:30 a.m.	*Panel IV: A Model To Guide the Development of State Management Plans*	**Kathe Glassner-Shwayder**
	Discussion on Goals of Model State Management Plan	**Jay Rendall**
	New York	**Tim Sinnott,** New York Department of Environmental Conservation
	Michigan	**Mark Coscarelli,** Michigan DNR
	Minnesota	**Jay Rendall,** Minnesota DNR
	Wisconsin	**Ron Martin,** Wisconsin DNR
10:15 a.m.	Break	
10:30 a.m.	*Workgroup Sessions with the following objectives:* 1) critique and expand the model of the state management plans; 2) identify tools (i.e. regulations and statutes) from coastal management plans to implement the state management plans; 3) identify enforceable policy and statutes that coastal management plans can use to control aquatic nuisance species.	
12 Noon	Lunch (on your own)	

1:00 p.m.	*Workgroup Sessions* (continued)	
3:15 p.m.	Break	
3:30 p.m.	Report on Workgroup Findings	Facilitated by: **Kathe Glassner-Shwayder**
4:15 p.m.	Workshop Summary/Where Do We Go From Here?	**Michael Donahue**
5:00 p.m.	Adjourn	

APPENDIX G

New York State's Coastal Management Program Summary

NYS COASTAL MANAGEMENT PROGRAM SUMMARY

Overview of the NYS CMP

The New York State Coastal Management Program (CMP), administered by the Department of State, Division of Coastal Resources and Waterfront Revitalization, is established pursuant to the federal Coastal Zone Management Act of 1972 (CZMA) and the State Waterfront Revitalization and Coastal Resources Act of 1981 (Article 42 of the Executive Law). These acts call for the coordinated, comprehensive, and full exercise of governmental authority over land and water uses in the coastal zone for the purpose of preserving and using coastal resources in a manner that balances natural resource protection and the need to accommodate economic development. To accomplish this the acts provide, in part, that all State and federal actions in the coastal zone shall comply with a single set of decision-making criteria, or policies.

The principal function of the CMP is to provide a framework for government decision making in the coastal area. As defined in the CZMA, a State Coastal Management Program includes policies to guide public and private decisions in the coastal area **(CZMA section 304.(12))**. It is a requirement of the CZMA that a CMP include enforceable policies to guide these decisions **(the term "enforceable policy", as defined in Section 304.(6a) of the CZMA, means State policies which are legally binding through constitutional provisions, laws, regulations, land use plans, ordinances, or judicial or administrative decisions, by which a State exerts control over private and public land and water uses and natural resources in the coastal zone)**. The CMP contains forty-four policies with which federal and state agencies must adhere and which serve as a reference for local government actions in the coastal area **(CMP I-3)**. These policies are set forth in the State of New York Coastal Management Program and Final Environmental Impact Statement. In general, they either: 1) promote the beneficial use of coastal resources, by encouraging water-dependent use, expansion of ports and harbors, revitalization of waterfronts, and expansion of access and recreation opportunities; 2) prevent the impairment of certain coastal resources, including fish and wildlife habitats, dunes, beaches, islands and other natural protective features, wetlands, scenic areas, historic resources, and agricultural lands; or 3) provide for the management of activities which may impact coastal resources, including dredging, ice management, energy facility development, waste disposal, construction of erosion structures, and mineral resource exploration. The coastal policy statements, their attendant explanations and guidelines, and existing federal and State environmental and resource management laws provide the objectives and standards for the program. It is important to note that the consistency provisions of the CZMA and Article 42 of the Executive Law are regulatory provisions that apply to government decision-making. The coastal policies and these consistency provisions require that government agencies adhere to these standards when considering their direct, funding, or approval actions.

Implementation of the CMP is effectuated through three program components -- Local Waterfront Revitalization Programs (municipal coastal programs that refine the CMP to suit local circumstances and needs), review of federal and State government actions for consistency with

the policies, and the advocacy of projects and activities which implement specific coastal policies.

Authorization (core statutes) supporting the program

In 1981, the State Legislature enacted the Waterfront Revitalization and Coastal Resources Act (Article 42 of the Executive Law) to implement the CZMA at the state level **(Executive Law Article 42, added by Chapters 840 and 841 Laws of 1981)**. The Act functions to coordinate policy and planning for the wise use and protection of the State's coastal resources **(Executive Law 910)**. In that statute, the State Legislature recognized that the state's coastal areas were increasingly subject to the pressures of population growth and economic development, including the demands of industry, commerce, residential development, recreation and energy production. These competing demands have resulted in the loss of living marine resources and wildlife, diminution of open space areas, shoreline erosion, permanent adverse changes to ecological systems and a loss of economic opportunities **(Executive Law 910)**. Article 42 seeks to insure "the proper balance between natural resources and the need to accommodate the needs of population growth and development" **(Executive Law 910)**. The Act and its implementing regulations contain many of the State's coastal policies. New York's policies are enforceable through the Waterfront Act **(Executive Law Article 42)** and other existing state laws pertaining to environmental protection, development and energy facilities **(see authorities listed in CMP section II, following each policy explanation; CMP, Volume II)**. The Coastal Area policies applicable to State agencies are codified in Section 912 of Article 42 of the Executive Law and its implementing regulations contained in 19 NYCRR Part 600.5.

The CMP policies are grouped into ten categories that address: 1) Development; 2) Fish and Wildlife; 3) Flooding and Erosion; 4) Public Access; 5) Recreation; 6) Historic Resources; 7) Visual Quality; 8) Agricultural Lands; 9) Energy and Ice Management; and 10) Water and Air Resources. They were developed after an exhaustive analysis of the full range of federal and state regulatory and decision-making standards contained in statutes, rules, regulations, and case law that affect the coastal area. These policies are explicit statements of existing state policy in the coastal area of the state, and were developed to provide clear and explicit statements of federal and state policy in the coastal area that are to be used in government decision-making.

Examples of enforceable policies and statutes that the state CMP can use to control aquatic nuisance species

Two examples of existing State Coastal Policies that could be used to control ANS are Policies 7 and 44 of the CMP.

In order to implement Policy 7 of the CMP, the Department of State has designated significant coastal fish and wildlife habitats throughout the State's coastal area pursuant to Article 42 of the Executive Law and its implementing regulations. Summary habitat narratives that include a generic description of activities that could affect the biological, physical or chemical parameters of these designated habitats were prepared prior to the designation of the habitats.

Policy 7 states: **Significant coastal fish and wildlife habitats will be protected, preserved, and where practical, restored so as to maintain their viability as habitats.**

The Policy explanation of policy states, in part:

"Habitat protection is recognized as fundamental to assuring the survival of fish and wildlife populations. Certain habitats are particularly critical to the maintenance of a given population, and, therefore, merit special protection...In order to protect and preserve a significant habitat, land and water uses or development shall not be undertaken if such actions destroy or significantly impair the viability of an area as a habitat. When the action significantly reduces a vital resource (e.g., food, shelter, living space) or changes environmental conditions (e.g., temperature, substrate, salinity) beyond the tolerance range of an organism, then the action would be considered to "significantly impair" the habitat. Indicators of a significantly impaired habitat may include: reduced carrying capacity, changes in community structure (food chain relationships, species diversity), reduced productivity and/or increased incidence of disease or mortality...When a proposed action is likely to alter any of the biological, physical or chemical parameters as described in the narrative beyond the tolerance range of the organisms occupying the habitat, the viability of that habitat has been significantly impaired or destroyed. Such action, therefore, would be inconsistent with the above policy."

Policy 44 states: **Preserve and protect tidal and freshwater wetlands and preserve the benefits derived from these areas.**

The explanation of policy 44 includes a description of the benefits provided by wetlands, and why these areas are to be preserved and protected.

These policies, and their attendant explanations of policy which contain decision-making policy standards and guidelines, are derived in part from Articles 15 (Protection of Waters), 24 (Freshwater Wetlands) and 25 (Tidal Wetlands) of the Environmental Conservation Law and their implementing regulations, and from Article 42 of the Executive Law and its implementing regulations.

<u>Elements of the CMP that can facilitate implementation of the ANS state management plans</u>

The State is currently completing its first regional coastal management program for the Long Island Sound region. The policies of this draft Long Island Sound Coastal Management Program (LISCMP) have been amended to reflect the unique circumstances and needs of the Long Island Sound region, as well new State and federal legislation affecting the region. A new policy for this regional program, incorporating the "old" policy as well the intent of the Nonindigenous Aquatic Nuisance Prevention and Control Act and complementary State legislation, has been included in the new LISCMP policies. Regional programs may also be developed for the Hudson River, the Great Lakes, and the St. Lawrence River regions. The State ANS plan, and refinements and implementation of components of the ANS plan, could be integrated in the

policies of these regional elements of the State CMP. The decision-making standards in the policies, and federal and State consistency provisions of the CZMA and Article 42 of the State Executive Law, prohibit federal and State authorization, funding, or direct actions that would result in activities that would adversely affect the biological, chemical, or physical tolerance range of species within, or which rely upon, components of designated habitats. The incorporation of specific standards to prevent, control, or manage ANS that are not already in the policies would prohibit certain State or federally funded, authorized, or direct actions from being undertaken in the coastal area, or, for federal actions, outside of the coastal area if the actions might affect the coastal area.

Projects funded by CMP related to ANS issues

None to date, although funding or other activities in order to implement ANS plans or other activities is possible.

scr:c:ans.sum

APPENDIX H

Workgroup Assignments for the Workshop
Aquatic Nuisance Species and Coastal Management Programs: Toward a Regional Strategy in the Great Lakes Basin

AQUATIC NUISANCE SPECIES AND COASTAL MANAGEMENT PROGRAMS: TOWARDS A REGIONAL STRATEGY IN THE GREAT LAKES BASIN

Workgroup Assignments

Blue Group (Library)

Facilitator: Michael J. Donahue, Great Lakes Commission

Mary Frazer, Wisconsin Coastal Management Program
Charles Boydstun, National Biological Service
Allegra Cangelosi, Northeast-Midwest Institute
Mark Coscarelli, Michigan DNR
Ann Conrad, Freshwater Foundation
Gary Isbell, Ohio DNR
Dave Jude, Center for Great Lakes & Aquatic Sciences
Brian Miller, Illinois/Indiana Sea Grant
Karen Pirkola, University of Michigan/Mystic Seaport Museum
Dan Thomas, Great Lakes Sport Fishing Council
Cynthia Hagley, Minnesota Sea Grant
Nancy Taaffee, University of Illinois

Orange Group (Salon D)

Facilitator: Kathe Glassner-Shwayder, Great Lakes Commission

Ellen Brody, NOAA, Office of Ocean and Coastal Resource Management
Mary Bielen, Ohio Sea Grant
Jeffrey Busch, Lake Erie Office
Mike Klepinger, Michigan Sea Grant
Sandra Kempner, U.S. Fish & Wildlife Service
Randy Lang, Indiana DNR
Paul Marangelo, University of Michigan/Mystic Seaport Museum
Tracy Mehan, Michigan DNR
Commander Eric Reeves, U.S. Coast Guard
John Schwartz, Michigan Sea Grant
Dan Terlizzi, Sea Grant Water Quality Specialist
Hank Vanderploeg, Great Lakes Environmental Research Lab

Red Group (Suite 364)

Facilitator: Chris Shafer, Michigan Coastal Management Program; and Lori Reynolds, Great Lakes Commission

Christine Kasselman, Ohio Coastal Management Program
K. Douglas Blodgett, Illinois Natural History Survey
Nils Halker, Freshwater Foundation
David Garton, Indiana University
Karen Lagerberg, Saginaw Bay Watershed
Ron Martin, Wisconsin DNR
Lieutenant Katherine Weathers, U.S. Coast Guard
Leroy Hushak, Ohio Sea Grant
Howard Wandall, Michigan DNR
Tim Sinnott, New York DEC
Jay Troxel, U.S. Fish & Wildlife Servic

Yellow Group (Salon E)

Facilitator: Jay Rendall, Minnesota DNR

Catherine Cunningham, Michigan Coastal Management
Tom Busiahn, U.S. Fish and Wildlife Service
Jim Falk, Delaware Sea Grant
Rich Harkins, Lake Carriers Association
Maran Hilgendorf, Ohio Sea Grant
Rodney Horner, Illinois Department of Conservation
Ron Kinnunen, Michigan Sea Grant
Amy Shelton, Lake Michigan Lakewide Management Plan
Lori Reynolds, Great Lakes Commission
Don Schloesser, National Biological Service
Rick Shertzer, Pennsylvania DER
Bernie Ylkanen, Michigan DNR