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**Inn at Newport Beach, Newport, Rhode Island
Meeting Summary Draft • May 17 and 18, 2004**

Panellists in attendance: Jason Baker, MA Office of Coastal Zone Management; Mihai Balaban, Transport Canada, Marine Safety; Nancy Balcom, CT Sea Grant Extension Program; Kevin Cute, RI Coastal Resources Management Council; Christopher Deacutis, Narragansett Bay Estuary Program; Lisa Gould, RI Natural History Survey Inc at URI; Willard Harman, NY State Federation of Lake Associations; John McPhedran, ME Department of Environmental Protection; Leslie Mehrhoff, University of CT; Anne Monnelly, MA Department of Conservation and Recreation; Chuck O'Neill, NY Sea Grant Extension Program & National Aquatic Species Clearinghouse; Judith Pederson, MIT Sea Grant College Program; Timothy Preddice, NYS Department of Environmental Conservation; Amy Smagula, NH Department of Environmental Services; Jan Smith, MA Bays National Estuaries Program; Susan Snow-Cotter, MA Office of Coastal Zone Management; James Straub, MA Department of Conservation and Recreation; Donna Turgeon, National Oceans and Atmospheric Administration; Shannon Weigle, Massachusetts Bays National Estuary Program

Other participants and guests: David Alves, Aquaculture and Fisheries Co-ordinator, RI Coastal Resources Management Council; Michelle Babione, USFWS Silvio O. Conte National Fish and Wildlife Refuge; Cynthia Boettner, US Fish and Wildlife Service, New England Invasive Plant Group; Jonathan Bossenbroek, University of Notre Dame; Paul Gregory, ME Department of Environmental Protection; Mark Malchoff, Lake Champlain Sea Grant Project, Michelle Robinson, MA Department of Conservation and Recreation; David Strayer, Institute of Ecosystem Studies

Contract Staff: Gretchen Fitzgerald (Ecology Action Centre); Jennifer Forman-Orth (S&T Committee Contract Intern); Michele L. Tremblay, ANS Program Manager (nature resource communications); and Brent Williams (P&L Committee Contract Intern)

MONDAY, MAY 17, 2004

Welcome, introductions, review of Panel meeting agenda, and updates by Co-Chairs

– *John McPhedran*, ME Department of Protection and *Susan Snow-Cotter*, MA Office of Coastal Zone Management

NEANS Panel business and meeting scheduling – *Michele Tremblay*, ANS Program Manager
Michele Tremblay announced that the fall Panel meeting will be in New York. She will be sending out information on location and possible dates in the near future. Location suggestions for the upcoming meeting included Southern Adirondacks, Sagamore, Lake George or the Gideon Putnam Hotel, Saratoga Springs.

Action Item: *Michele Tremblay* will send out an e-mail to poll people on possible dates in November / December for the upcoming meeting and finalise a location.

Approve final draft of bylaws – *John McPhedran*, ME Department of Protection and *Susan Snow-Cotter*, MA Office of Coastal Zone Management

In addition to the changes adopted by the Steering Committee during its work session (which preceded the convening of the Panel for this meeting), *Nancy Balcom* suggested the following changes to the Panel Bylaws: in the list of participants, NOAA should be listed and NMFS should be deleted. *Will Harmon* moved to adopt the Panel bylaws. *Donna Turgeon* seconded this motion. All in attendance were in favour of adopting the Bylaws.

Action Items: NEANS Panel bylaws were adopted, with the above suggested change.

National Aquatic Invasive Species Act (NAISA) Reauthorization Update – *Susan Snow-Cotter*, MA Office of Coastal Zone Management

Susan Snow-Cotter reminded the Panel that letters of support for the budget for NAISA have been requested. In addition, the US Oceans Commission has made four recommendations regarding invasive species.

Action Item: *Michele Tremblay* will draft a letter on behalf of the Panel expressing support for the recommendations of the US Oceans Commission regarding invasive species.

Invasive Species Advisory Committee (ISAC) Update – *Chuck O'Neill*, NY Sea Grant Extension Program & National Aquatic Species Clearinghouse

The Invasive Species Advisory Council (ISAC) met in Honolulu last March. ISAC now has staff and an international reach. The charter renewal was drafted and they are awaiting its approval by the Department of the Interior. The *Invasive Species Pathways* document has been accepted by ISAC and has been sent to the National Invasive Species Council (NISC) for implementation and review by federal agencies. The report is available at www.invasivespecies.gov/council/pathways.doc. Comments on the document will be accepted up until May 28, 2004.

While in Hawaii, ISAC members learned that Hawaii has invasive species Task Forces for each island, and one over-arching Task Force. The state governor spoke strongly in favour of the invasive species plan and task forces at the meeting.

During the fiscal year '05 and '06, there will be cuts to invasive species budgets. Due to a federal rescission of funds, there will be no meeting of the ISAC until October. The ISAC Executive Committee will meet in June to plan ISAC 3. *Shippen Bright* is chairing, and he may be chairing for the next 2 years. Executive Order 1312 is undergoing a 5 year revision; there are a few bills pending to codify NISC. Invasive Species Management Plan is being revised by the Office of Management and Budget. ISAC folks are glad with the change in administration and budgets, it has been an upbeat process. More states will be mounting Invasive Species Task Forces in the future, as well as Invasive Species Management Plans. *Shippen* approached the governor of Maine to adopt broader invasive species management – not just dealing with aquatics.

ANS Task Force and Invasive Species Council (ANSTF) – *Susan Snow-Cotter*, MA Office of Coastal Zone Management

In two weeks, *Michele Tremblay* will be attending the ANS Task Force meeting (May 26-27). *Donna Turgeon* informed the Panel and attendees that *Dean Wilkinson* of the ANSTF has posted his retirement, but has been asked to stay on as long as possible. Funding for his position has been disappearing. *Dorn Carlson* is in training to try to fill in for *Dean* when he leaves. *Donna's* boss is working through the matrix of ANS programmes.

Panel Membership – *Susan Snow-Cotter*, MA Office of Coastal Zone Management

Gaps in Panel participation include Canadian provincial representation, consistent attendance by Coast Guard, and a representative from Connecticut (*William Hyatt* had intended to attend this meeting, but had been unable to come at the last second). The Environmental Protection

Agency, Region 1, had intended to send a representative to the meeting, but weren't able to come as well. The New England Interstate Water Pollution Control Commission could also be contacted. Other agencies and industries were also mentioned, including US Fish and Wildlife Service, Department of Agriculture, Native American representatives, and representatives from aquaculture, shipping, and the pet industry. Industry representatives will probably be invited on a case by case basis.

Action Items: Official letters of invitation to join the Panel will be issues to Quebec, Newfoundland and Labrador, and Prince Edward Island, and the Army Corps of Engineers (*Edwin Theriault*, Vicksburg, Mississippi). Also, *Jay Baker* will get in touch with his contact in the Coast Guard to invite him to join the Panel. *Mark* and *Gretchen* will pass on their contacts in Quebec (*Mark*), and the other provinces (*Gretchen*). *Mihai Balaban* will send contact information to *Michele* for Andrea Locke's replacement (*Chris Morey*). *Jan Smith* will send Michele the contact information for New England Interstate Water Pollution Control Commission. *Judith Pederson* will call *Phyllis Windle* of the Union of Concerned Scientists. Other possible members included the International Association of Fish and Wildlife Agencies (*Glen White*), a representative from Border Patrol and Customs, Homeland Security office in New England, Ocean Conservancy (*Susan Faraday*) and The Nature Conservancy (*Mark Smith* or *Heather Potter*).

Highlights from Rhode Island - *Kevin Cute*, Rhode Island Coastal Resources Management Council

Kevin Cute summarized three initiatives taking place in Rhode Island to combat invasive species. Through these three initiatives, the terrestrial, freshwater/wetland, coastal, and oceanic issues are being dealt with. Based on these initiatives, RI will be in a good position to take next steps to deal with invasive species.

1. *Lisa Gould* led the formation of the Rhode Island Invasive Species Council, an informal group of state and federal agencies, academics, NGO's, and industry. The Council is not a regulatory body. The RI Natural History Survey has created posters with invasives and impacted species side by side, along with a brochure to go with the poster. The Rhode Island Invasive Species Council has developed criteria for classifying invasive species. The Council has not been active for three years. Macrophytes and some animals are on this list.
2. Rhode Island now has legislation and regulations for creating a Biosecurity Board, represented at this meeting by *Dave Alves*. *Dave* is the aquaculture coordinator for the Board, a section which includes a state vet, a representative from the Department of Environmental Management, and aquaculture industry members. The aquaculture group is meant to address the valid fears of commercial and recreational fishers regarding the impact of diseases and invasive species on their industry. The statute specifies that the Biosecurity Board is responsible for keeping abreast of disease, invasive species, and genetically modified organism issues. The Board functions under the Rhode Island Coastal Resources Management Council. As an example of how the Biosecurity Board functions, *Kevin* described a case where Senator Jack Reed had heard that the Biosecurity Board had written to the EPA Corps of Engineers, strongly cautioning against the introduction of *Crassostrea ariakensis* into Chesapeake Bay, expressing concern that the oyster would spread up the coast and impact the hard-fought- for industry in Rhode Island. Senator Reed has now gotten involved in the issue because of these concerns and the Board continues to work with his office. The Coastal Resource Management Council (CRMC) has two sections on the "Red Book" of regulations. One of these rules is Prohibition 311, which requires aquaculture to confer with the Biosecurity Board on any proposal to import non-

indigenous species. Prohibition 311 also requires non-indigenous release protocols to reduce the risk of accidental releases in coastal waters.

3. Last summer's Rapid Assessment Survey caught the attention of legislators. *Christopher Deacutis* of the Rhode Island Department of Environmental Management wrote a white paper on enforcement policies for ballast water. The white paper lays out the health, environmental, and economic impacts of ballast water. In the absence of federal statutes, he suggests that states draw their own statutes on ballast water. What the white paper has done is communicate very well to legislators how dire the situation is. The white paper was circulated and is available at <http://www.nbep.org/pubs/pdf/BallastWhitePaper.pdf>.

General Comments:

Christopher Deacutis stated that a significant driving force behind the developments in Rhode Island was the proposed creation of a deep water port. *Jim Carlton* had spoken to the economic development committee about the development of this port and the risk of spreading invasive species. The white paper on ballast water, which was written by a great intern from Brown University, was commissioned because of the impetus for legislation brought about by *Jim's* talk. The deep water port proposal is now dead and so some of the pressure is off for the legislature to proceed. They are looking for federal funds for legislation in Rhode Island. This year, *Chris's* job will be to respond to fish kills in Rhode Island because of the high incidence of kills during the last summer, so he will not be focusing on invasives.

Kevin Cute said that *Danny Goulet* of the CRMC had told him the ballast issue might not be dead. The go ahead has been given to dredge the channel to Providence to its original depths. Dredging will be complete in November. So, it behooves the state to proceed on invasive species.

Judith Pederson said that the US Coast Guard has authorization under NISA to get rules in place for ballast.

Kevin Cute said that they do not presently have a state management plan for invasive species. The most recent development is a new program called Coastal and Estuarine Land Conservation Program (CELCP), which was created for the purchase of coastal properties. Perhaps through this funding source, they could pay someone to write a comprehensive plan. This could be done through the Biosecurity Board. If they could get \$5000 to find someone knowledgeable, this could be achieved. The Coastal Institute, the University of Rhode Island, and the CELCP have a possible, do-able offer to perform this task.

Christopher Deacutis said there is philosophical support but no staff or financial support for invasives at this time. *Chris* recommended two groups, the Brown Environmental Center and Marine Affairs and Inland Waters at the University of Rhode Island, as possible avenues for action. There was some worry that \$5000 would not buy enough action on this front. The spike of interest that happened after the Rapid Assessment Survey is over and now they are at ground zero again on this as well.

Susan Snow-Cotter pointed out that The Nature Conservancy took the lead on this in Hawaii, perhaps *Lynne Hale* from Conservancy could be another option. The plan could be possible through the Coastal Resources Center and The Nature Conservancy. Perhaps Rhode Island Seagrant (*Pete August*) could also be an option.

Jay Baker pointed out that perhaps the Panel could support such an initiative, but there was some concern that this might be precedent-setting.

Christopher Deacutis pointed out that the lack of a management plan is preventing the state from accessing federal funds.

Roundtable I – updates from provinces, states, and other organizations

Nancy Balcom stated that Connecticut is moving ahead on an aquatic species plan. Three subcommittees have been formed which met last February. The toughest part of the process is sorting out tasks and strategies. *Nancy* thanked *Jay Baker* for coming to talk to the group about the process. They hope to be borrowing from the experiences of Maine and Massachusetts. The agency should be ready this summer, with hopes for approval of the plan this fall. The Connecticut Invasive Plant Council was formed two years ago; they have list 7 – 9 invasive plants, mostly aquatic.

Bill Harmon attended a meeting of the Federation of Lake Associations, where there were representatives from about 100 lake organizations. He distributed a lot of information there and was impressed with Maine's recreational boating program.

Donna Turgeon said that Seagrant and NOAA are taking the lead on invasive species. Funding for '04 was cut, and funding for '05 was at or below current levels. The funding for '06 is looking much better and they are currently working it into their matrix. The budget climate for invasives is good right now. She is working on a project to build and maintain inventories of all coastal species (invasive or not), providing the basic information needed for early warning systems. There is the base budget for herself and one other person to work on this. They have the lists for Cnidaria and Ctenophores. They currently have the crustaceans list in press, which includes all aquatic, marine, and freshwater species. The tunicate publication is also ready. She currently has 50 taxonomists in her cadre of experts.

Action Item: If you know of experts who should be in Donna's cadre of experts, please contact her.

Mihai Balaban reminded the Panel that the international ballast water convention was approved by the International Maritime Organization in February. Based on consultations on the Canada Shipping Act, Transport Canada (TC) is working to extend ballast water regulations to the east and west coasts. They have decided on a two tiered approach: they will incorporate the international ballast water convention into the revised Canada Shipping Act by 2006. Secondly, they are working on east coast guidelines for North-South traffic between the US and Canada. Based on discussions in October at the workshop held in Halifax, TC would like identify suitable alternative ballast water exchange areas for coastal trade. He would like to work with NEANS and the states to identify places on the eastern seaboard for ballast water exchange. In the near future trade between New Jersey and New York (Cape May) and the Bay of Fundy may not need to exchange their ballast water. The issue has been raised because Irving oil tankers commonly go between New Jersey and St. John, NB. For these are short distances, exchange may not be feasible.

Roundtable II

Gretchen Fitzgerald stated that the Ecology Action Center has been participating in consultations on the Canadian national plan on invasive species, and encouraging nationwide consultations of the Canada shipping act. We have also submitted out comments on the Green Ship Initiative, asking that ships given Green Ship status have high standards of treatment for hull fouling organisms, sediments, and ballast water, as well are a commitment to research, monitoring, and education. We are also doing outreach through a school education program called the Junior Shorekeepers.

Tim Preddice stated that New York is working on an invasive species management plan, but there are only two people working on this issue right now (himself and *Tim Sinnott*). As of

August, the legislature / governors appointed an ANS Task Force for the state, which included the Commissioner of the DEC and a representative from Agriculture and Marketing. The Task Force met in April, and *Tim's* bureau chief was there. They will be coming up with tasks for each agency to do. The DEC has developed standard operating procedures for minimizing the transfer of invasive species by agency workers. Working groups of the Task Force will break out soon. *Tim Preddice's* next task may be to focus on the bait industry.

Jim Straub has taken the recommendations from the Bar Harbor Rapid Response Workshop and used them to help develop control techniques for eight invasive species found in state parks in Massachusetts. He will give these species-specific response plans to the Panel. So far, they have dealt with plant species only. In addition, a bill has been passed through the state legislature, approving a sticker program for recreational boaters, very similar to Maine's boat sticker program. The money from the program would go to the DEP for management of invasives. The bill currently requires approval from the governor. They are also working on a database for invasive plant workers. IPANE has also developed a questionnaire people can send in with information with data for their database.

Action Item: The Panel could write a note to the state governor, asking him to pass the bill for recreational boater sticker program in Massachusetts. If you want copies of the IPANE questionnaire, contact *Cynthia Boettner*.

Cynthia Boettner informed the Panel that volunteers are monitoring water bodies for invasives. The Sylvio O. Conte group has been doing work on water chestnut in the Holy Oak area. The New England Plant Group (IPANE), which is affiliated with the Invasive Plant Atlas, is now producing a newsletter twice a year. *Cynthia* circulated the latest copy of the IPANE newsletter.

Action Item: If you know of any folks in the area who should be involved in the Sylvio Conte project, please contact *Cynthia*. Please keep the IPANE newsletter in mind for items of interest and as a possible avenue for communication.

Judith Pederson said that they are working on the report detailing the proceedings of the ballast water alternate exchange zone workshop that MIT Seagrant co-sponsored last year in Halifax. *Judith* also informed the Panel of three workshops are coming up this year on invasive species: 1. January 5: Tunicate meeting in Woods Hole; 2. August 2004 – Fourth Annual Marine Bioinvasions Conference in New Zealand; and 3. April 2006: ICES / Seagrant Meeting on Marine Bioinvasions (Fisheries and Aquaculture focus) in Boston. On Stellwagen Bank, there is a new person doing outreach through the REEF project, who is including invasive species in her course to divers. This might be a good avenue for the Panel to explore.

Christopher Deacutis – RAS is interested in backing future endeavors.

Jan Smith has been training citizens to monitor for invasive species in tide pools for the past 2 years. Last week, the State of the Bays Project heard that 450 species were found in a survey that were new to science. They will be following up to check this statement.

Donna Turgeon pointed out that in many monitoring efforts, 10-15% of species identified are new to the survey.

Michele Robinson said that the MA Department of Conservation and Recreation had received \$1 million to work on variable milfoil, as both of the proposals they submitted to NOAA and the EPA were funded. This money will go toward funding biological, ecological, and control

work. They are now looking at 13 proposals in a major grant application process. *Michele* will be taking on a new position to deal with aquatics in lakes and watersheds. They have no state ANS plan as of yet in Massachusetts. New Hampshire and three other states are working on an interesting education and outreach project plan for ANS management. The sticker bill for recreational boaters was killed in the house, although the senate passed it. There was some confusion about the implications of the sticker bill and also some opposition to charging additional fees to boaters.

John McPhedran passed on a message from *Mike Hauser* of Vermont's DEP, who was not able to attend the meeting. *Mike* has acquired a permit to eradicate milfoil from an 1100 square acre area of Lake St. Catherine. *John* informed the Panel of an incident in which a staff member of Maine's Department of Environmental Protection unintentionally brought home a cane toad from a visit to Hawaii. The unfortunate toad was almost released to the wild before the staff member realized that it was a non-native species (probably transported in amongst her dive gear). After realizing the toad in her living room was a potential invader, she took the toad to the DEP offices, where it is now preserved in alcohol. On a more serious note, *John* mentioned that there was a change in state legislation last session, where a bill was introduced that would require all boats coming out of infested lakes to be inspected. Access points to these lakes would be gated. This got people talking about issues pertaining to public access, etc. Bill 23 is another new bill, which beefs up Fish and Wildlife enforcement abilities. Along with Fish and Wildlife, the DEP is doing rapid response research for introduced fish and plants. They found out that *Cabamba* was sold from biological supply store to schools – and a letter was sent to the supplier to stop this practice.

Mark Malchoff of the Lake Champlain Sea Grant Project said that they have been issued a permit for milfoil eradication in Lake St. Catherine. In addition, they are working on a new regulation for bait fish, developing a "green list" of species that are permitted. A draft of the list has been released and they are awaiting feedback. *Lisa Windhausen* is revising their state invasive species management plan. They have also been targeting boaters and anglers to decrease the spread of invasives. A full page add was put in the *Derby Gazette*, which reaches 40-50,000 anglers, and a group of officials that run derbies in Vermont have been asked to circulate outreach materials.

Jay Baker informed that Panel that a Fellow has been hired (Susan Park, a Ph.D. student from University of Delaware) to work on rapid response issues. She will be starting on August 1st and working for the Panel for two years. There will be conference calls over the next two months to discuss her tasks. The MA Coastal Zone Management will also be getting their intern to look for data to input into the MarineID Database. They are currently in their second year of implementation of their state management plan for invasive species. They have a half-time coordinator looking at outreach, but funding is needed.

Action Item: *Jay* should talk to *Donna Turgeon* about available data to insert into the MarineID database.

Shannon Weigle has been working with Fish Mart, and they have inserted an article in their monthly newsletter to suppliers that highlights invasive species. They have also sent 70 boxes of display stands and fliers to Fish Mart stores for distribution. *Shannon* also pointed out that there is a new website posted regarding invasive species, targeting a young adult audience. It's available at <http://www.northeastans.org/pet/where.html>. Through a project with *Dave Smith* at Smith College, a survey of 84 aquatic pet owners in New England was conducted, asking them about their awareness of invasive species issues: 87% said yes, they were aware of the issue.

The results of a study by *Dave Smith* and *Jim Carlton* will be published in *Conservation Biology*.

Chuck O'Neill, along with *Tim Sinnott*, has been working on the NY invasive species task force. They have developed a committee structure, with committees on early detection and prevention, rapid response and control, restoration, information management, and public awareness. The next meeting will be in June or July. The water chestnut project has money attached to it and the website will be online in September or October.

Tim Preddice said that the first task of the state invasive species task force has been to produce a report on what the priorities will be for New York.

Amy Smagula made the NEANS key chains available.

Action Item: Please distribute key chains in you state or province. Canadian representatives should make sure their contact information is put online.

Jenn Forman-Orth asked if there would be any value in the NEANS Panel coordinating a boat sticker program.

Chuck O'Neill said he was worried about the proliferation of boat sticker programs. Some tournaments cross borders and this would mean people would have to pay for another sticker to go across state borders for a weekend.

Adjourned for Committee Meetings

TUESDAY, MAY 18, 2004

Committee Updates

Ballast Water Committee: The Ballast Water Committee has reviewed outcomes from the fall 2003 meeting on alternative ballast exchange zones. They have developed a workplan which would entail getting Memoranda of Understanding from states and provinces regarding ballast water management. They are going to gather information necessary to developing a regional policy on ballast water and re-convene via e-mail or conference call to get this in place. By the November meeting, they should be able to have next steps for the NEANS Panel to become involved.

Action Item: If you are interested in seeing slides of physical oceanography from the fall 2003 ballast water workshop, let *Judith Pederson* know. The ballast water subcommittee will meet to identify information and contacts necessary to establishing a regional policy on ballast water management.

Community, Education, and Outreach (CEO) Committee: The CEO Committee has finalized the language for a protocol for Panel publications, and they will give this to the Steering Committee for review.

Action Items:

1. The CEO will take the information in the Panel outreach sheet and convert it into a trifold brochure that can be sent to conferences.
2. The CEO will make recommendations for changes to the website on the aquarium trade and implement them.
3. *Chuck O'Neill* will take leadership on outreach to the live seafood industry, and do an analysis of the different cultures and languages that should be targeted. A draft message and layout for content for the materials will be created.

4. *Michele Robinson* will update the website printed on the NEANS key chains so that you are linked directly to state contacts.

Policy and Legislation (P&L) Committee: Outlining legislation in each state and province has been the focus of the committee.

Action Items:

1. Develop a guidebook of legislation on invasive species in the region, with a package to give to legislators, along with a letter describing the NEANS Panel.
2. Expand the membership of the P&L Committee. They are especially interested in volunteers for a new co-chair, since *Shannon Weigle* is stepping down.
3. The Panel will send comments regarding the recommendations of the US Commission on Ocean Policy, emphasizing a regional perspective (especially as it relates to ballast water) and the role that NEANS can play in this process.

Science and Technology Committee:

Action Items:

1. Develop a compilation of state lists of invasive and potentially invasive species. This compilation of species lists will be up on the NEANS website very soon (see the draft webpage at <http://www.knottybits.com/temp/NEANS/NEANSPrioritySppLists.htm>). They will also begin compiling distribution data, using the IPANE database to house this information.
2. *Jay Baker* will be compiling other datasets into the MarineID Database. They have hired an intern to look for data and update the information. Please e-mail *Jay Baker* or *Jim Straub* if you have any more information on new data to put into the MarineID database.
3. *Jenn Forman-Orth* will compile information on existing technologies available for controlling invasive species and contacts for expert advice. A draft of this website is available at: <http://www.knottybits.com/temp/NEANS/NEANSRapidResponse.html>.
4. Please let *Donna Turgeon* know about taxonomists that could be used in the contact list of expert taxonomists.

Action Item: June 11, 2004 is the deadline for committee chairs to send in their workplans.

Invasive Plant Atlas of New England (IPANE) Update – *Les Mehrhoff*, University of CT

The Invasive Plant Atlas of New England project was created through funding from the USDA. Major partners in the project are the University of Connecticut, the New England Wildflower Society, and the Silvio O. Conte National Fish and Wildlife Refuge. They have just initiated a new partnership with the Global Biodiversity Information Initiative (GBIF). The goals of IPANE are: 1. to be part of the New England's early detection initiative; 2. to gather current and historical distribution data; 3. to make information available to the public; 4. to conduct and engage science; 5. to increase public awareness; 6. to train volunteers; and 7. to ensure interoperability with other databases.

IPANE is a nexus of information transfer from project staff to participants, stakeholders, etc. Components of the project are: 1. gather and record information on invasive and potentially invasive plants; 2. interact with volunteers; 3. train volunteers; and 4. data management. The database logs over 1500 users per day. The IPANE catalogue is a compendium of 110 species and gives the criteria used to designate species. It has probable or questionable sightings, and a science-based watch list that they are also developing. The data warehouse records information from various data sources. They will be conducting a survey this summer to see who is using their website.

IPANE Collections Databases are linked to herbarium specimens, all of which are geo-referenced and updated with current field data. The volunteer network they have created consists of 25 groups in each state. They have volunteer coordinators, training sessions, and cover terrestrial and aquatic species. The USGS will develop a handheld capacity to use online reporting forms and to improve quantity control. They are doing aquatic plant training sessions this summer. They solicit reports through a “report sighting” button on their website. This “report sighting” tool is linked to a verification and rapid assessment process.

The USGS will grant funding for including other databases information in IPANE. IPANE maps are currently static, but they want to automate them and make them searchable by geographical site.

The rapid assessment network component will help with early detection, rapid response, and long-term monitoring. The early detection page includes a list of early detection species, a table of state status for all six states, early detection protocols, and instructions on how to report possible new incursions. The list of early detection aquatics includes three new species that could be introduced via water gardens or accidental introductions. There are “Invasive Alerts” for tansy ragwort and hydrilla. They have sent PDFs of these alerts to feed stores and farm equipment stores to try and get farmers on the look out. The focus is on changing the perception, shifting the paradigm to get detections happening at the point where populations are at their active and proactive phase of expansion, rather than reacting when the population has reached a “reactive” phase.

The Invasive Plant Atlas for mid-Atlantic is being looked at as a prototype project federally.

Other aspects of the project include quizzes, weed wisdom, and even recipes. They have two years left of funding and lots of support from federal agencies. You can contact them for more information at: ipane@uconn.edu or see their website at <http://ipane.org>. A two-page sheet on the IPANE project was made available.

Jenn Forman-Orth asked if IPANE had an e-mail protocol to deal with noxious weeds.

Les stated that giant hogweed is an example of a difficult species because it is often misidentified by the public. They have a list of contacts of experts, but they must balance the need for reporting with over-reporting of non-weed species. Then there is the issue of how you create a list of species to watch for: someone by the name of *Peter Raven* is working on this problem. Also, there is someone by the name of *John Stohlgren* who working on a NASA model of risk assessment for invasive species.

Jan Smith pointed out that there is increasing evidence that invasive species evolve and adapt to different conditions in their new range, and this complicates prediction efforts somewhat.

John McPhedran pointed out that Connecticut is trying to deal with the Internet sale of plants. Banned plants can be bought through Internet sales from other states. Seven aquatic species are banned, including *Egeria* and *Cabomba*, but there is no mechanism in place to deal with Internet traffic. Unfortunately, many people have not heard of the ban in nursery stores. They have written to stores to tell people about the ban. Last year, universities within the state asked for permission to use *Egeria tonsa* in the laboratory. Connecticut law exempts possession for education and conservation work. Exotic species biologists don't want to be impeded from having invasives for research purposes, but on the other hand it is known that invasive species can be spread via school students and teachers.

Judith Pederson pointed out that landscape schools only teach their students about a certain number of species. Landscapers put burning bush in front of every fast food restaurant and post office.

Les Mehrhoff recommended certain areas for eradication efforts, such as state natural reserves or picking certain areas to restore to native vegetation in people's yards.

Establishing Research Priorities for Invasives in the Northeast - *Judith Pederson, MIT Sea Grant College Program*

Judith reviewed the Panel's exploration of research priorities in the Northeast.

Discussion ensued about the relative importance of biological information versus socio-economic information.

Les Mehrhoff pointed out that we need information on the economics, and that figures on control costs would be really helpful.

Jim McPhedran agreed that economics is a priority; we need to know how much will it cost to take a certain action.

Nancy Balcom said that a resource economist, *Bob Pomeroy*, was looking into the economics of terrestrial invasions. He is performing a study on: 1. aquatic indigenous plants and animals; 2. the importation process for anything live; 3. economics of doing nothing; and 4. the benefit of a species versus control costs.

Judith Pederson pointed out that much of the economics data comes from industry. We need a more objective source of data.

Chuck O'Neill stated that we need a verifiable and credible number. The Pimental number was a multiplier, an estimate. It has become an urban invasive species myth.

There was also further discussion about the priorities for research on the biology and ecology of invasive species, especially in regards to predicting invasions and the importance of taxonomic expertise.

Action Item: NEANS could write a letter to EPA, NSF, and NOAA to encourage them to continue and expand efforts to encourage taxonomic expertise. This letter could also go to the Deans and Department Chairs of local universities. *Amy Smagula* has a list of universities with undergraduate studies that could be used for this purpose. Contact the Union of Concerned Scientists to see if they can participate in the initiative to elucidate research priorities.

New England Rapid Assessment Survey (RAS) - *Judith Pederson, MIT Sea Grant College Program*

Monitoring of marine bioinvaders is supported by the Massachusetts Aquatic Invasive Species Plan. They would also like to know the impacts of invasive species, although the Rapid Assessment Survey records little quantitative information at this point other than relative abundance of organisms. The survey records the origin of introduced species and when they arrived. The survey is undertaken by about 12 taxonomic experts. The criteria for choosing sample sites, which are generally floating docks and similar structures, is history and current uses (aquaculture, etc.). Field identifications are verified in the lab. They also archive reference/voucher samples. They are also developing searchable databases. The list of species

found in the RAS is available in the Seagrant website: <http://massbay.mit.edu/exotic-species/exoticmaps/>. In the last survey, 200 – 230 species were identified as native, 10% non-native, and 10% cryptogenic (origin unknown). The origin of cryptogenic species is based on the date of first observation.

Judith went on to compare the results of the Northeast RAS with non-native species surveyed in the different regions: San Francisco Bay – 76; Puget Sound - 37; Massachusetts – 28; Rhode Island – 21; Maine - 18 (only two sites surveyed); Massachusetts and Rhode Island – 32. In the last RAS, a new nudibranch (*Thecacera pennigera*) was found in Wood's Hole that is native to the coast of Europe. *Hemigrapsus penicillatus* is now in Europe, imported from Asia, and is expected here soon. Abundance of species varied from site to site; scraped off areas tended to have more settlement of invasive species. They intend to do a Rapid Assessment Survey once every three years.

Jan Smith said that they currently don't have the ability 90% plants in the RAS.

Donna Turgeon pointed out that the protocol is really important; Jim Carlton created the protocols for the RAS.

Jim Straub wondered if the same protocols could be used for sites on lakes. How many sites would be needed in lakes? The goal would be to have user groups to know what's there.

Judith Pederson remarked that not that many sites would be needed. It would be feasible to do if you had a good blueprint / outline and good protocols.

Updates to the NEANS Panel Website - Jenn Forman-Orth, NEANS Panel Intern

The following three webpages will be added to the NEANS page:

1. Compilation of priority species lists. You can search this page by organism type and there are links to other websites.
2. Analysis of invasive species lists for New England plants. The top ten non-native plants of concern are listed, as well as least frequently listed species. There is also a state-by-state breakdown by species or state. Species in common and different for each state are also listed.
3. Rapid response information. This page includes control methods for selected species. Selected species are listed in alphabetical order, with a link to each one. The goal is to link educational and commercial sites, and link protractors and detractors of various control methods. They want to have links to experts and legislative / policy advice.

Action Items: The links to these sites will be sent to the Panel list serve. The Nature Conservancy weeds website posts success stories and should be searched for our webpage content. Place a disclaimer on this page, saying that NEANS does not recommend any of these techniques listed. The next step to show distribution data on the web for listed species. *Judith Pederson* pointed out that potential invaders should be indicated as such.

Invasive Species Legislation in the Northeast - Brent Williams, NEANS Panel Intern

Brent gave an overview of invasive species laws in the Northeast and the purpose of his project, the Legal Framework in the Northeast. There are 10 jurisdictions in the Northeast and each implements its own laws. The number and type of ANS laws varies with state. These should be integrated to fight invasive species. Different laws have different purposes as well: 1. stop introductions; 2. limit the spread of invaders; 3. increase public awareness; and / or 4. raise revenue to combat invasive species.

Types of ANS Laws:

1. general management strategies (e.g.: aquatic plant growth control);
2. laws that deal with particular organisms;
3. laws targeting specific pathways; and
4. laws that deal with ANS indirectly through aquaculture (Maine, Connecticut) or dealing with native species (Maine, New York).

Innovative Laws in the Northeast. This is an area of ongoing research; a thorough listing of the laws in each state or province will be available through his project. However *Brent* had already noted some innovative laws, such as:

- Maine has the lake sticker project, and they use the money they raise to inspect boats and educate the public. There is also increased awareness through signage.
- New Hampshire – has funding allocated to control aquatic plants; boat registration fees go toward fighting ANS (control, prevention, lake restoration); some funding ends by 2008. The Department of Environmental Services (DES) can grant funds to conduct research on aquatic species remediation. The DES also has an annual presentation to governor and legislature regarding exotic aquatic plants
- Vermont also has a boat registry program; moneys raised go towards fighting ANS (boat registration fees). The transport of milfoil to and from VT is illegal.
- Rhode Island has a Biosecurity Board to prevent agricultural disease transmission as well as non-native species and GMOs.
- New York has Aquatic Plant Growth Control Boards. Town boards may assess properties for invasive species.
- Intergovernmental Cooperation - NY DEC is responsible for cooperating with neighboring states, US and Canadian federal government have agreements to preserve the environment.

Analysis of laws: Different jurisdictions have different funding methods for ANS. ME, NH, VT have boat registration fees which provide dedicated funds, while other states have general treasury funds.

Does on size fit all? Probably not. Maine will inspect boats, but the state of NY has larger traffic.

John McPhedran – noted that it was not a requirement to inspect your boat in Maine; it's a courtesy inspection.

Brent went on to discuss means of improving the ANS legal framework in the Northeast. For instance, we could make boat inspections mandatory for states that share common waterbodies like the Connecticut River, which crosses the boundaries of four states. It is apparent that:

1. the extent of laws varies with jurisdiction;
2. there needs to be more focus on coordination;
3. provinces and states can coordinate with each other to improve laws;
4. states and provinces can impose similar effective laws; and
5. we do not know, in many cases, if a particular law is effective.

The guidebook *Brent* will produce will include: a) statutes and rules by province and state; b) a summary of each law; c) pros and cons of laws, based on the results of interviews; and d) where to find more information, via references and contacts.

Brent concluded his presentation by saying that ANS spread throughout the region; thus, we need regional approach to dealing with this issue. However, jurisdictions vary widely in their approach to ANS. The guidebook he will produce will be a resource to provide greater understanding of other jurisdictions' ANS laws.

Jan Smith stated that federal level is a good way to approach ANS. The EPA could do the regulating on its own, or this could be done through the office of Homeland Security.

Amy Smagula pointed out that local environmental laws might lead into federal laws.

Judith Pederson stated that for ballast water, a federal approach has been taken. Canadian regulations are coming soon, and the federal register has NAISA laws coming soon too. The Northeast Midwest Institute has state laws up on its website.

Chris Deacutis pointed out that the Interstate Shellfish Sanitation Commission (ISSC) is used to regulate the shellfish trade among states. This could be a model for the pet, bait, and nursery industries

Susan Snow-Cotter stated that the ISSC is a way to tackle inter-state commerce issues. It's a good model of state-federal cooperation.

Bill Harmon said that in New York one small lake or town may have inspection projects, but at the other end of the lake there may be no inspections or a different kind of inspection; people need to find ways to do the same thing on the same water body.

Paul Gregory stated that in Maine, e-commerce is another issue that is difficult for states to regulate.

Chuck O'Neill pointed out that it may be possible to use the US Postal Regulations to regulate e-commerce.

SPOTLIGHT ON SPECIES: ZEBRA MUSSEL

Predicting a Zebra Mussel Invasion - Michele Babione, USFWS Silvio O. Conte National Fish and Wildlife Refuge

The focus of the Silvio O. Conte Center spans the entire watershed of the Connecticut River, not just the refuge. Recently, they discussed the greatest threats to biodiversity in the refuge, and bioinvasers became a topic for discussion. There was a general feeling that if the zebra mussel could be in the Connecticut River, it would be here already, so they had to combat that sense of apathy.

The predictive model of zebra mussel distribution they developed with Don Pugh looked at various factors, including: invasion potential (based on water quality, river width, distance to current infestations, boat access and other vectors); and invasion impact (gauged based on distance downstream that could be affected, resources, salmon stocking, special focus areas, aquatic invertebrates).

Approximately 30,000 water quality data points are available through EPA and the USGS. Ideal calcium carbonate (CaCO_3) for zebra mussels ranges from 25 to 125 mg/L, with an ideal range of greater than 90 mg/L. This led to complacency, since maps showed that most of the Connecticut River is not good habitat for zebra mussels. In addition, most water quality samples had lower pH than was ideal for zebra mussels. Many North American models use CaCO_3 and pH to model the distribution of zebra mussels, with varying success, usually applying their predictions to lakes and ponds, not rivers. European studies show little correlation between zebra mussels and environmental factors.

River width was also looked at as a proxy for water velocity.

Boat Access Locations were ranked according to the potential to colonize areas downstream, water quality, river width, aquatic resources downstream, and level of use.

The goals of the Connecticut River Watershed Zebra Mussel prevention effort are to:

1. inform the public of the problem;
2. conduct boat surveys;
3. protect commercial interests in native fish species (recreational fisheries);
4. initiate citizen monitoring;
5. develop rapid response protocols;
6. perform risk assessments; and
7. monitor effectiveness of the programs.

In Massachusetts in 2004, they coordinated a pilot project in which citizens monitored 40 high risk areas and performed 250 boat surveys. They also performed additional surveys and outreach about boating and aquatic invasions ("River Rangers"). Boat surveys were performed on boating use: 20-30 interviews were conducted per week. Volunteers conducted outreach, distributed educational materials, and early detection cards.

Nancy Balcom said that Connecticut River is the most eastern part in *Crepidula* distribution and can probably support zebra mussels, as can the Twin Lakes.

Judith Pederson stated that Seagrant has a zebra mussel kits for 5th graders and a kit for teachers. She encouraged *Michele Babione* to use it in her work.

Jenn Forman-Orth asked if they applied their model to infested areas to see how good it was for predicting infestations?

Chuck O'Neill stated that this was done in the Hudson River, testing a number of parameters. Some parameters showed good correlation with zebra mussel distribution, some just the opposite. He said they may have more success if they used nutrients.

Application of a GARP- based approach to determining the potential distribution of zebra mussels in New England - Jonathan Bossenbroek, University of Notre Dame

The purpose of *Jonathan's* project was to assess the potential ecological and economic impact of a zebra mussel invasion to western river systems and to assess the success of the 100th meridian initiative. Goals of the GARP (Genetic Algorithm of Ruleset Production) project are to identify appropriate habitat, pathways, biological and economic services at risk, and cost and effectiveness of education and inspection initiatives. GARP is a modeling technique that identified viable habitat for zebra mussels. *Dr. David Strayer* has performed predictions throughout the US 15 years ago, using temperature, precipitation, and frost as predictors of zebra mussel distributions.

In the current analysis, they looked at 11 geological and environmental variables and found that six factors that were good biological predictors of zebra mussels. These six variables fit nicely with the 100th Meridian. In the Northeast there are areas that are at risk. There are also species that would be impacted: native Unionids occur here (10 species in Rhode Island, 12 species in Connecticut, Florida has 51). Meanwhile, the west has fewer Unionids (Washington has 5 species), even though the 100th Meridian is such a focus for zebra mussel prevention.

The six factors that were correlated with zebra mussel distribution were: frost frequency, temperature, elevation, precipitation, slope, and bedrock (surficial geology).

Zebra mussels have spread from 1986 to present via navigational waterways. There is shipping up and down the Connecticut River and Columbia Rivers. Current distribution of zebra mussels was defined by 1993. In 1991, Lake Champlain infested, although there was a

recent advancement into East Twin Lake in 1998. Essentially, however, between 1991 - 1993, the eastward expansion slowed.

Distribution in the Great Lakes is very localized (probably less than 200 km from large populations). Also, the number of inland lakes infested has decreased from 50 to 60 to 100 new infestations per year to less than 20 lakes reported as infested. There are three possible explanations for this: outreach worked, zebra mussel fatigue (people got tired of talking about zebra mussels), and/or there is a decreased possibility of new infestations.

Conclusions: Zebra mussels are not marching across the landscape, but their range is still expanding. The Northeast does have appropriate habitat for zebra mussels, but they are not here yet. We need to decide what is it worth to keep zebra mussels west of the 73rd Meridian.

Chris Deacutis speculated that the lack of zebra mussels could be related to the number of freshwater boaters. Rhode Island has mostly salt water boaters.

Jim Straub stated that some boaters travel from Maine to Massachusetts twice a month. The probability exists for transfer; it's just a matter of determining how low it is?

Status of Zebra Mussels in the Hudson River: Impacts on Riverine Ecology and Fisheries - *David Strayer, Institute of Ecosystem Studies*

In the Hudson River, they have between 3 - 17 years of pre-invasion data and 7-11 years of post-invasion data. Zebra mussels changed everything in the Hudson River and did so in a big way.

The Hudson River is fresh water, but from Albany to Manhattan (~ 250 km), the river is tidal. The Hudson is not an especially favorable environment for zebra mussels. Calcium carbonate is approximately 27 mg / L, 27% of the benthos has rocky substrate, and the downstream portion has a strong tidal influence.

In January 1991, zebra mussels appeared in a mid-system lake. By 1992, the mussel had spread everywhere except regions that were greater than 10% seawater. Rapid geographic spread was accompanied by rapid population growth. The weight of the mussels (without shells) was greater than that of all other organisms combined. The population cycles in abundance and there are dominant pulses of strong year-classes.

Impacts of the zebra mussel infestation include: the disappearance of edible plankton (80-90% of plankton biomass is gone and 90% of rotifers are gone); lower dissolved oxygen (laboratory studies suggest that zebra mussels are responsible for this); declines in large zooplankton (*Bosmina* - dropped by 60% ; Copepods - no change); and declines in the density of benthic organisms (3 species of unionid mussels, the fingernail clam, polychaetes, *Diptera*).

More resources may be available because phytoplankton are gone. There is now two times the inorganic phosphate, and a fifty-fold increase in water transparency. Macrophytes may have increased due to increased water clarity. The forage base for fish has also shifted: 1/2 the fish are gone in some areas. Open water fish such as striped bass, white perch, and shad suffer the most, whereas shallow water fish may do better. There were also changes observed in the growth rates of some fish.

In conclusion, you can't give an unequivocal answer about the effect of zebra mussels since conditions in the ecosystem vary from year to year and other changes have occurred in the river since zebra mussels arrived. What we see in the data is probably the impact of zebra mussels filtered through the ecosystem.

Donna Turgeon asked why weren't copepods impacted?

David Strayer stated that big centric diatoms may have increased and this may provide food for the copepods. Alternatively, copepods may be released from fish predation.

Other Business

Michele Tremblay asked the Panel to provide her with ideas for future spotlight or species or training panels. *Donna Turgeon* suggested a focus on the lionfish.

Adjourn

Meeting summary prepared by Gretchen Fitzgerald