

AQUATIC NUISANCE SPECIES TASK FORCE: MINUTES OF THE 2005 SPRING MEETING

On May 24–26, 2005, the ANSTF met at the Monterey Conference Center in Monterey, CA. This document includes the following sections:

- Summary of the three-day ANSTF meeting.
- An acronym list for easy reference.
- A list of the common and scientific names of species mentioned.

ANSTF SPRING MEETING MAY 24–26, 2005

During the meeting, ANSTF members voted on several issues. The following list is compiled from the list reviewed at the end of the meeting (p. 49), as well as from presentation summaries:

- The fall 2004 meeting minutes were approved, pending minor corrections shared with the group.
- The ANSTF approved membership by the NPS and MARAD. The DFO will be asked to participate as an invited observer.
- The ANSTF voted to approve the lists of action items and potential agenda items for the fall 2005 ANSTF meeting as shown on p. 49.
- The ANSTF voted to consider holding the next meeting the week of either October 24 or November 14.

Several action items were generated during the ANSTF meeting. The following list is compiled from the list reviewed at the end of the meeting (p. 49), as well as from presentation summaries:

ANSTF Annual Report

- Get the draft annual report out to ANSTF members by the end of June.
- Develop a timeline/process for developing information for future annual reports (attempting to get the report out by the end of each calendar year).
- Develop a template/structure for information requested for the annual report.

Control Committee

- Give IAFWA 60 days to see if they can find a Control Committee chair.
- Charge Steve Kendrot, APHIS, with determining whether a nutria control committee is necessary (including developing a scoping meeting, potential membership, and potential responsibilities if a national management plan is deemed unnecessary).
- Once the Control Committee is formed, have its members decide whether to add restoration to its name or to create a restoration working group.

For easy reference, an acronym list is included at the end of this document.

State ANS Management Plans

- Work with regional panels and their state contacts to get input on the revision process for state ANS management plans.
- Get comments on the North Dakota ANS management plan to the Executive Secretary by June 15, 2005.
- Get comments on the Kansas ANS management plan to the Executive Secretary by July 1, 2005.

Miscellaneous Action Items

- (Web Page Working Group) Continue website development, including dealing with site update/maintenance issues and looking for software to help manage links.
- Seek participation from the DHS Borders/Customs in the Stop Aquatic Hitchhikers! campaign.
- (ANSTF co-chairs) Send letter to the DFO, MARAD, and NPS regarding membership status.

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May 24 Welcome and Preliminary Business

On the first day of the meeting, Dan Diggs of the USFWS Pacific Region filled in for Dr. Mamie Parker in welcoming members of the ANSTF and guests to the meeting. He described the public comment process. If time allowed during the meeting, comments and questions would be taken as they arose. But if time were short, people could sign up at the registration table to make public comment during the designated time near the end of the meeting. He also asked for modifications to the agenda. None were made. During the welcome period, several topics were raised:

- **Restoring the ecosystem in the Central Valley**—Diggs introduced Dan Castlebury, ANS Coordinator from the Sacramento office of the CNO. Castlebury talked about his involvement with the CALFED Bay–Delta Program, a joint state and federal effort to restore the integrity of the ecosystem in California’s Central Valley. Within that program are several objectives, one of which is addressing nonnative invasive species. So far, they have dealt with a number of issues, such as the invasion by mitten crabs and decline of pelagic fishes in the delta. Although they have a much larger budget than anticipated (10%), he recognizes that invasive species constitute more than 10% of the problem. Castlebury highlighted some of the CNO’s accomplishments including the *Caulerpa* management plan, the mitten crab management plan, and WRP activities under the 100th Meridian Initiative. He added that Jeff Herod, USFWS, would provide an update on ecological surveys later in the meeting.
- **Status of the Executive Secretary Position**—For the purpose of this meeting, Kari Duncan, USFWS, sat in as Executive Secretary. Notice of the position was closed April 18. At the same time, the USFWS implemented a hiring freeze at the regional and Washington DC offices. Despite the freeze, hiring for the position was approved, and she expected a selection to be made within 90 days. Duncan thanked Pam Meacham, ANS Coordinator for the State of Washington, who acted as Executive Secretary from January to April 2005.
- **Approval of the November 16–17, 2004, ANSTF meeting minutes**—After minor errors were pointed out by Lisa Windhausen and Marilyn Katz, it was moved and approved that the minutes be accepted with the suggested corrections.

Review of Fall 2004 Action Items

Duncan reviewed the following action items from the November 2004 meeting:

Task	Status
<ul style="list-style-type: none"> • Approve the May 2004 meeting minutes with one change (mistaken attribution of a comment to Zajicek on p. 76). 	Complete
<ul style="list-style-type: none"> • Put deadlines on incomplete action items from the previous ANSTF meeting. Send out draft deadlines via e-mail, and if no replies, make these deadlines final. 	In process
<ul style="list-style-type: none"> • Determine the process for revising state ANS management plans and send that process to ANSTF members. 	Draft is complete and included in the briefing booklet for discussion at this meeting

Task	Status
<ul style="list-style-type: none"> Endorse Habitattitude™ using the language offered by Riley (“...to fully endorse the campaign, as a primary author and funding partner of Habitattitude™, and encourage regional panels, member agencies, and ex officio members to do likewise”). 	In process and scheduled for discussion at this meeting
<ul style="list-style-type: none"> Distribute the draft <i>National Management Plan for the Genus Caulerpa</i> to ANSTF members and regional panels for a two-week review prior to release. Comments will be due December 3, 2004. 	Complete—new draft pending (Jeff Herod, USFWS, received comments, reviewed them, and sent them on to the working group. Comments will be addressed in about 30 days and notification of the public comment period will then be published in the Federal Register.)
<ul style="list-style-type: none"> Change the name of the Gulf of Mexico Regional Panel to the Gulf and South Atlantic Regional Panel. 	Complete
<ul style="list-style-type: none"> Add Alabama, Georgia, and South Carolina (and North Carolina, if interested) as new members of the GSARP. 	Complete (Per Ron Lukens, GSMFC, North Carolina has not yet decided.)
<ul style="list-style-type: none"> Add Marcia Brockbank, program manager for the San Francisco Bay Estuary Project, as a member of the ANSTF. 	Complete
<ul style="list-style-type: none"> Add Matt Fleming, Maryland Department of Natural Resources, as the CBP’s replacement for Leo Dunn on the ANSTF. 	Complete
<ul style="list-style-type: none"> Add Bill Jacobs, The Nature Conservancy, as a new member of NEANS. 	In process
<ul style="list-style-type: none"> Distribute Zajicek’s letter about the generic risk analysis process. 	Complete
<ul style="list-style-type: none"> Send the brown tree snake bill (HR3479) to ANSTF members. Co-chairs will work with the chair of the brown tree snake working group on implications of this bill. 	Complete

Additions to ANSTF Membership

Duncan reported on requests for ANS membership from the NPS, DFO in Canada, and MARAD. The charter mentions that the ANSTF can add new federal members, but the U.S. Department of State is the only one added that wasn’t in the statute. Currently, there are 20 members. If the ANSTF grows too large, it may be difficult to coordinate action. The following issues specific to the agencies requesting membership were raised:

For easy reference, acronym and species lists are included at the end of this document

National Park Service

- The NPS has informally participated at various points. In addition, the agency is involved at the regional level.
- The NPS would be the third member from the DOI.

Fisheries and Oceans Canada

- Canada asked about ex officio membership, but USFWS attorneys suggested that the DFO participate as an invited observer.
- The ANSTF is statutorily limited in terms of international membership.
- The roles of invited observer and ex officio member are discussed in different sections of NANPCA. Neither has a formal vote, although the ANSTF has not run into a situation where voting status was a problem since most decisions are made under a consensus approach. So the differences in roles are more statutory than pragmatic.
- The DFO and Transport Canada have been encouraged to participate at the regional level. The DFO has been engaged in regional panels and other efforts. Transport Canada has not expressed interest in ANSTF membership. Another agency, Environment Canada, deals mostly with terrestrial issues. NEANS is trying to get Environment Canada involved since Transport Canada and the DFO are already involved in that regional panel.

U.S. Maritime Administration

- MARAD is already involved in numerous ANS activities and, of its own accord, has stepped up to work with the ANSTF. Prior to the conflict in Iraq, the agency had offered ships as testing platforms and has helped fund the BW demonstration project for the last several years.
- Given a recent MOU to increase shipping between the United States and Canada to alleviate some of the traffic on highways, MARAD would be the only member from the DOT, now that the USCG is in the DHS.

After discussion, the ANSTF voted on and approved membership by the NPS and MARAD. The DFO will be asked to participate as an invited observer. Letters to each agency will be written and sent by the ANSTF co-chairs.

ANSTF Strategic Plan Implementation

Annual Report to Congress

According to Duncan, one of Meacham's major tasks as acting Executive Secretary was to compile the annual report to Congress. This task took considerable time, and the draft will be sent to ANSTF members by the end of June for review. Everyone had hoped that they could meet the goal to have the report ready by the end of December, but it wasn't possible. The first annual report was prepared in 1992 or 1993, so there was little precedence as far as process, timeline, content, and format.

Most of the ANSTF discussion centered on the need for such information. Since an Executive Secretary is scheduled for selection in about 90 days, participants agreed to let the person who fills that position draft a process and timeline to present at the fall 2005 ANSTF meeting. As part of developing a process and timeline, the new Executive Secretary could write a letter to all ANSTF representatives requesting their organizational input by a set deadline. This request in writing would help representatives meet the deadline. Participants also suggested that the timeline coordinate with budget requests. The fall meeting may have originally been scheduled to coordinate with these budget

requests, but it could also be the meeting for reporting accomplishments. Several members requested that the process better guide regional panels and others on the timeline, content, and format of the reports. Such information would not only help agencies, organizations, and regional panels meet the request for their reports, but it would also facilitate compilation of the information into an effective annual report to Congress. Participants also requested that the reporting process satisfy as many reporting needs as possible (such as cross-cutting budgeting reports to the OMB, reports on state management plans, and others).

Duncan asked that ANSTF members review the draft annual report when they get it, tentatively by the end of June, and provide feedback on structure and functionality. She commented that the goal will be to ask people to provide information about expenditures and accomplishments as soon after the end of the fiscal year as possible so that the report is ready by the end of the calendar year. Several members emphasized that the annual report is important in that it may influence pending legislation. Bringing Congress's attention to ANS accomplishments may facilitate the reauthorization process.

ANSTF Strategic Plan Revision

Another task, determining whether the 2002–2007 ANSTF strategic plan should be updated, will also need to be addressed by the new Executive Secretary. At the fall meeting, the ANSTF formed a working group chaired by Bill Wallace, APHIS. Although that working group hasn't convened yet, it was suggested that efforts be dovetailed with revision of the NISC management plan since an updated ANSTF strategic plan would feed into revision of the management plan. The NISC process has also been delayed about six months. It will be kicking off in June, with a detailed outline tentatively finished by the end of September and the complete revision finished about a year from now, including public comment and revision with OMB approval. Participants were reminded that the ANSTF can make comments and then agency representatives can make comments on behalf of their agencies.

ANSTF Structural Needs Identification

Dean Wilkinson, NOAA, and Duncan led the discussion about ANSTF structural needs. The ANSTF structure is complex. Currently, there are a number of control and management plan working groups but no chair for an umbrella control committee to oversee these working groups. In the past, a control and management plan working group had been suggested for nutria, but no such working group has yet been formed. In addition, a restoration committee has been established, but its role in relationship to a possible control committee is unclear.

Control Committee

Members were asked for a volunteer to chair a control committee. Since no one volunteered, Pam Thibodeaux, USFWS, suggested that the state agencies consider chairing the committee to promote state and federal coordination. Roger Sorenson, AZGFD, standing in for Larry Riley to represent IAFWA, highlighted the need for consistency in this position: he wasn't sure whether Riley would be a permanent member or whether he would cycle out. He agreed to take the proposition of finding a state member to chair a control committee back to IAFWA for discussion and response to the ANSTF. A deadline of 60 days was set to find a chair for the Control Committee, after which an e-mail will be sent to ANSTF members requesting committee membership. The chairs of all the working groups should be on the committee.

During the discussion, the following roles for the committee were identified:

- The Control Committee should focus primarily on process. There is a great need for coordination given the proliferation of working groups. The Prevention Committee offers a model to follow since it provides a coordination function to several working groups. In this role, the Control

Committee would ensure review and implementation of the plans. Because the states have such a large role in control activities, the states should definitely be involved in the committee.

- To date, it has been up to the working groups to coordinate with the research, prevention, and CEO committees themselves. The working groups should send research, monitoring, and public outreach needs to the Control Committee, which should forward these needs to the appropriate committees.

Nutria Control and Management Working Group

ANSTF members were asked for their thoughts on the need for a nutria control and management plan working group. This topic was initially raised at the fall 2002 ANSTF meeting in Hawaii and discussed again at the spring 2003 meeting in New Orleans. APHIS has already volunteered to chair the working group, and the USGS has expressed interest in participating. Several reasons both for and against forming a nutria working group were raised:

- Because the affected regions are already heavily involved in control or eradication efforts, a national management plan is unnecessary. Early on, it had been decided that ongoing efforts would not necessarily become an ANSTF function.
- The need for a control and management plan should come from the ground up rather than being forced on people already working hard on the issue. If regional panels aren't aware of a need, then no working group should be formed.
- Support from the ANSTF, via a control and management plan, may open the door to additional sources of funding.
- A national management plan is less important than a means for exchanging information, especially given the lack of awareness in places such as Oregon that are now experiencing problems with nutria. Having the area elevated to the national level would benefit areas just beginning to see these problems.
- Without a larger umbrella, successful eradication projects such as the one for the Blackwater National Wildlife Refuge (MD) may be lost.
- A nutria working group might lead to development of a new model, that is, coordinating activities rather than developing a control and management plan. This role could become even more important because there tends to be more action on the ground before people bring a concern to the ANSTF.

The ANSTF decided to ask Steve Kendrot, APHIS, to develop the initial membership of a potential working group and determine the level of interest. In essence, he would hold a scoping meeting to determine whether a nutria working group (or control committee) was necessary or whether some other group would be more appropriate. Matt Fleming, CBP, offered to assist since his organization had raised the issue in Hawaii.

Restoration Committee

Wilkinson commented that the trend in the next iteration of the NISC national management plan is to integrate the concept of restoration into control activities. He suggested that the ANSTF talk about two issues: whether restoration is an area in which the ANSTF wants to begin activities and, if so, whether restoration should be covered in a separate committee or as a working group within the Control Committee. In a meeting with other federal members, Wilkinson said that he "made the foolish promise" to seek a chair from NOAA's habitat restoration folks, if it was the will of the ANSTF. Several issues were raised during the discussion:

- It is difficult to separate restoration and control. Many of the same people would be involved in restoration that are already involved in control discussions.
- Restoring native habitat should always be considered as a strategy for controlling reinvasion and promoting native species. Some sites are continually inoculated with invasive species, so control efforts fail over time.
- Several participants suggested that restoration be a component within the control and management plan working groups. Or higher-level questions could be dealt with at a committee level, while strategies were dealt with at the working group level. A restoration working group under the Control Committee may be an option.
- In another meeting, Thibodeaux heard Great Lakes people say that they'd like to find out from the ACOE how much it costs to restore x acres of wetlands. An answer to that question might help in agency planning.
- Many restoration activities are occurring outside the scope of ANS. NOAA's restoration projects have criteria for what needs to be restored. This component is managed separately and outside the context of invasive species, although ANS may be a component of what has to be done regarding a specific habitat.
- Another issue related to restoration is the prioritization of sites. The USGS is doing some work on determining priority sites, but this work is all species specific.

At the end of discussion, three options were suggested: developing a restoration working group under the Control Committee, creating a full committee, and encouraging working groups to include restoration strategies to their control and management plans. Since the Control Committee is being formed, the ANSTF approved a suggestion to defer the issue to that committee, once formed, to discuss the best approach for incorporating restoration.

Ex-Officio Members Annual Reports

Chippewa Ottawa Resource Authority and Native American Fish and Wildlife Society

Mike Ripley, Chippewa Ottawa Resource Authority (CORA), talked about the CORA, the Native American Fish and Wildlife Society, and ANS issues affecting tribes of the United States. Of the 562 federally recognized Indian tribes in the United States, 224 belong to the Native American Fish and Wildlife Society. The society "exists for the protection, conservation and enhancement of Native American fish and wildlife resources." The Native American Fish and Wildlife Society does not have a subcommittee or division that specifically addresses ANS. Ripley's presentation focused on the Great Lakes and CORA's efforts since the Great Lakes are more greatly impacted regarding tribal resources.

CORA represents five tribes in Michigan regarding their commercial and subsistence fisheries in the 1836 treaty-ceded waters of Lakes Huron, Michigan, and Superior. The tribes that are party to the 1836 treaty are the Bay Mills Indian Community, Grand Traverse Band of Ottawa and Chippewa Indians, Little River Band of Ottawa Indians, Little Traverse Bay Bands of Odawa Indians, and Sault Ste. Marie Tribe of Chippewa Indians.

Ripley displayed a photograph taken at the end of the 1800s and noted the incredible whitefish fishery that Indians had depended on for thousands of years. In 1718, Sieur de la Mothe Cadillac wrote, "It is a daily manna which never fails; there is not a family that cannot catch enough fish for its sustenance throughout the year." This statement is no longer true because of ANS.

The sea lamprey arrived in Niagara Falls toward the end of the 1800s. Smelt was introduced by 1912, and alewife by 1933. By the mid-1950s, the Great Lakes fishery was devastated. In Lake Michigan, sea lamprey abundance was extremely high, and alewife made up over 90% of the total fish biomass. Lake trout were extinct, and many other native species (chubs, herring, and sturgeon) were either extinct or in severe decline.

Ripley displayed a map of the historic Michigan treaty boundaries. CORA participates on every level of the Great Lakes Fishery Commission and works with the USFWS, Canadian Department of Fisheries and Oceans, and state agencies on sea lamprey control. CORA's sea lamprey control efforts include maintaining sea lamprey traps on the Great Lakes tributaries for mark and recapture studies, collecting and maintaining live sea lampreys for the sterile male program, and participating in research to assess the damage caused by sea lamprey to the Great Lakes fishery. CORA also works with federal and state agencies to protect and restore the Great Lakes by participating in the GLP, lakewide management plans, and Great Lakes Regional Collaboration (under EO 13340).

The greatest challenge for CORA has been the continued introduction of ANS by BW. Over 70% of the 165 introductions have been through BW. CORA was an original signatory on the petition to the USEPA to repeal exemptions for BW in the Clean Water Act. CORA has supported individual state efforts to control BW and will continue to push for reauthorization of NISA with requirements for BW treatment.

Because NOBOBs comprise 70% of ships entering the Great Lakes, CORA has recommended that the USCG immediately develop a plan to address NOBOB vessels entering the Great Lakes to prevent discharge of reballasted water. CORA has also recommended that the USCG require ships to "swish-and-spit" or otherwise treat BW starting in the 2005 shipping season. CORA's final recommendation has been to finalize BW discharge standards.

The Great Lakes Regional Collaboration has five draft recommendations regarding BW:

- Immediate requirement that ocean-going vessels in NOBOB condition implement practices that are an improvement over current practices
- Immediate application of best performing ship-board treatments for ocean-going vessels, with continued review and improvement, to achieve an environmentally protective standard by 2011 (SB 770)
- Monitoring, reporting, and public dissemination of all ballasting activities to assess progress toward goals
- Assessment of best management practices for lakers (ships that do not leave the Great Lakes system)
- Research into ballast treatment technology

The Great Lakes Regional Collaboration's recommendations will not be finalized until December, but the consensus is for immediate implementation during the 2005 shipping season.

Ripley had several final thoughts for the ANSTF:

- It is the duty of the ANSTF to consult with DOT and others regarding ongoing introductions of ANS through BW.
- BW exchange is not working in the Great Lakes because nearly 90% of the ships are reporting themselves as NOBOBs. The ANSTF must declare that actions be taken to address NOBOBs.
- The Ballast Water Program Effectiveness and Adequacy Criteria Committee should be resurrected to address NOBOBs.

- The ANSTF should do whatever it can to promote reauthorization of NISA with environmentally protective standards for BW treatment.

International Association of Fish and Wildlife Agencies

Roger Sorenson, Hatchery Program Supervisor for the AZGFD, stood in for Larry Riley, Chief of Fisheries with the AZGFD representing the IAFWA, to talk about IAFWA activities related to ANS. Sorenson distributed a three-page report to the ANSTF and a journal article from *Fisheries* (“Native Inland Trout Restoration on National Forests in the Western United States: Time for Improvement?” May 2005, pp. 10–19). The following are IAFWA’s activities for the past year:

- IAFWA developed an e-mail network among the 50 states for dissemination of invasive species and ANS information to each member state, using the contact within each state as a conduit for information to each state wildlife agency director.
- IAFWA offered names for subcommittee membership through ANSTF and will continue to build upon those relationships.
- IAFWA analyzed and supported invasive species- and ANS-related legislation, including the reauthorization of NAISA.
- IAFWA worked with the USFWS and supported the deployment of HACCP training to state and federal employees through the National Conservation Training Center.
- IAFWA supported the Western Governor’s Association in its efforts to develop a NOAA grant proposal to implement West-wide capacity building for aquatic invasive species.
- IAFWA participated in a workshop convened by the World Fish Center and Institute for Social, Economic, and Ecological Sustainability at the University of Minnesota.

Although the association participated in several workshops at a worldwide, national, and local level, the most important issue was highlighted in the *Fisheries* article. Riley thought the article was important and wanted it read by ANSTF members. The article focused on the challenges of using toxins on USFS lands to remove undesired fishes as part of special status species recovery efforts. IAFWA has been involved for a number of years and thought the ANSTF might want to be involved as well. IAFWA developed a framework MOU to streamline the interaction between states and the USFS for piscicide application, but the MOU was never executed, and legal action was threatened in California. Currently, the USFS is working on a strategy to modify its rules, allowing that state wildlife agencies be exempt from USFS pesticide application regulations for use of piscicides on USFS-administered lands. While the MOU wasn’t executed, it kept pressure on the USFS. Because of the number of layers of compliance that sometimes have to be negotiated when an active response has to be mobilized, rapid response isn’t very rapid. The hope is that there will be a state-based decision-making process coupled with emergency provisions allowing for rapid response with preapproved treatments using proven ecologically sound tools. The ANSTF may be able to help with such issues where the “bureaucracy gets in the way.”

National Association of State Aquaculture Coordinators

Bob Hulbrock, CADFG and past president of NASAC’s Board, filled in for Paul Zajicek who could not attend. NASAC was formed in July 1991 as an affiliate of the National Association of State Departments of Agriculture. It has evolved into an important source of information and advice in the ongoing discussion of federal aquaculture policy and commitment. Members come from natural resource, agriculture, and industry associations that have responsibility for the regulation of aquaculture in their respective states. Early on, NASAC was appointed as an ex officio member to the

ANSTF to represent commercial aquaculture. State aquaculture coordinators are tasked with developing a healthy aquaculture industry in the United States.

NASAC has a close working relationship with private growers and their associations. United States aquaculture consists of over 6,600 farms, the majority of which are small, family owned, and rurally located. These farms produce a variety of fish, aquatic plants, reptiles, mollusks, and crustaceans for food, bait, fashion, pet, gardening, and biocontrol markets.

NASAC has participated in preventing the establishment and spread of ANS, especially as related to aquaculture through the following activities:

- NASAC provided extensive comments and information to the USEPA during its four-year effort to create aquaculture-effluent limitation guidelines and environmental best management practices, including the culture and management of nonnative species.
- NASAC members have served on several of ANSTF regional panels.
- NASAC members are participating in the development of the national Asian carp management and control plan.

NASAC appreciates the work of the ANSTF in developing a risk analysis process and looks forward to future implementation of this process.

Lake Champlain Basin Program

Lisa Windhausen, LCBP, distributed two products, a summary sheet of program updates and a Vermont baitfish guide. The program is a federal, state, provincial, and local partnership created by the Lake Champlain Special Designation Act of 1990.

One of the major activities for the LCBP has been development of *Opportunities for Action: An Evolving Plan for the Future of the Lake Champlain Basin*. One of the top four priority issues in the plan is nonnative aquatic nuisance species. The LCBP facilitates discussion among ANS resource managers; conducts education and outreach activities for ANS throughout the basin; and has administered more than \$1.3 million in grants for ANS research, monitoring, education, control, and demonstration programs.

The LCBP and Vermont Department of Environmental Conservation coordinated the 2005 revision of the *Lake Champlain Basin Aquatic Nuisance Species Management Plan*, which has been presented for review. Printing is expected within the next couple of months.

The LCBP also formed an ANS advisory subcommittee that held its first meeting April 11, 2005. The 20 volunteers present at this meeting formed two smaller working groups, the rapid response workgroup and the spread prevention workgroup. The rapid response workgroup held its first meeting May 18, evaluated the basin's current capacity for rapid response, and reviewed rapid response plans from other regions. The spread prevention workgroup held its first meeting May 11 to evaluate the list of spread prevention actions in the ANS management plan. This workgroup will make recommendations for future action.

The LCBP facilitates a water chestnut workgroup, which is working to elevate the water chestnut issue in the minds of local residents and public officials. The workgroup held a forum in 2004 and has articulated funding needs for an aggressive increase in water chestnut management in Lake Champlain.

Several new projects received funds through the LCBP. For example, the Lake Champlain Water Chestnut Management Program harvests approximately 200 acres and 120 miles of shoreline annually using mechanical and hand-pulling techniques. An alewife technical workshop and public outreach

campaign was funded to better understand the potential impacts of alewife on Lake Champlain and engage citizens in spread prevention. This is a new problem in Lake Champlain.

Funding has also been dedicated to zebra mussel monitoring on Lake Champlain and other basin lakes. The program has begun to explore methods of estimating adult densities. Several projects are looking at nonchemical alternatives to controlling sea lamprey. All alternatives explored better direct management efforts. In addition, the LCBP funded an angler outreach program that developed and distributed an aquatic invaders brochure and purchased air time for public service announcements about spread prevention. Several local organizations also received funding for ANS projects:

- A demonstration project to evaluate the effectiveness of an aquatic moth as a biocontrol agent for Eurasian watermilfoil
- Eurasian watermilfoil diver harvesting
- Development of best management practices for town officials and conservation groups in managing several wetland species
- Volunteer hand-pulling and stem-cutting programs on conservation lands

Chesapeake Bay Program

Matt Fleming, Maryland Department of Natural Resources, spoke about the CBP. The Chesapeake Bay encompasses approximately 64,000 square miles and include parts of six states—New York, Pennsylvania, Maryland, West Virginia, Virginia, Delaware, and the District of Columbia. The bay averages 21 feet deep, but in actuality, it is quite shallow. The Chesapeake Bay supports more than 3,600 species of plants and animals. As the largest estuary in the United States and one of the most productive in the world, Chesapeake Bay was this nation's first estuary targeted for restoration and protection.

Since its inception in 1983, the CBP's highest priority has been restoration of the bay's living resources. The work of the Chesapeake Bay Program Partners is guided by nearly 100 commitments and goals, contained in what's called the Chesapeake Bay Agreement. The CBP exploits the power of consensus and science to work on the many fronts needed to restore this complex ecosystem. Its job is to lead the partners, through various working groups and committees, in implementing the program's commitments as they relate to protection and restoration of the bay's living resources and their habitats—from developing precautionary fisheries management strategies to restoring critical habitat like wetlands, submerged aquatic vegetation, and fish passage and identifying and managing for nuisance species that have potential to harm the bay and its living resources.

In the Chesapeake Bay region, there are 202 species that are known or possible invaders thought to cause serious problems. Forty-six of these 202 species were identified as nuisance species through a survey of the bay's jurisdictions in 2001, of which six were recognized as posing the greatest threat to cause, or having the potential to cause, significant degradation to the Chesapeake Bay aquatic ecosystem. The six priority species were mute swan, nutria, phragmites, purple loosestrife, water chestnut, and zebra mussel. In May 2002, in partnership with the Maryland Sea Grant College, the CBP sponsored a workshop to develop regional management plans for each of the six priority species. With there is still much work to be done on nuisance species, the partners decided to widen the scope of influence by forming a regional ANS panel. Considering that the ultimate goal of the work was regional implementation and given the nature and movement of invasive species, the CBP believed that a Mid-Atlantic Regional Panel provided them the best opportunity for success.

San Francisco Estuary Project

Steve Moore, SFEP/Regional Water Quality Control Board, delivered a presentation about the SFEP. The SFEP was established under the 1987 Clean Water Act. The National Estuaries Program required

For easy reference, acronym and species lists are included at the end of this document

the development of a comprehensive conservation and management plan (CCMP), which was established in 1993 and signed by the governor and USEPA administrator. The CCMP set regional priorities and was implemented by the Water Board.

Top priorities of the CCMP are to expand, restore, and protect bay/delta wetlands and to reduce impacts of invasive species on the estuary through prevention, control, eradication, and education. Reducing the impacts of invasive species was elevated to the co-number one priority in 2003 since this estuary has the dubious distinction of being one of the most invaded estuaries in the United States. Invaders include water hyacinth and *Spartina*, which were intentionally introduced, and the Asian clam, which was introduced through BW.

Vectors for introduction include shipping, recreational boating, aquarium trade, aquaculture, live seafood trade, the nursery industry, research and education, anglers and bait shops, and government releases (biological control, sport fisheries, and erosion control).

Participation in advisory groups is this project's strength. The advisory groups coordinate and collaborate, lend expertise to the issue, make sure that the concerns and needs of the estuary are met, learn and integrate ideas from other programs, and develop regional plans and coordinated efforts. Some advisory groups are the ANSTF; WRP; Chinese Mitten Crab National Management Plan Advisory Committee; *Caulerpa* National Management Plan Advisory Committee; and California Marine Invasive Species Act Technical Advisory Groups, which include the General Technical Advisory Group, Technical Advisory Group for Ballast Water Treatment Standards, and Vessel Fouling Advisory Group.

The SFEP has had educational booths at numerous environmental events, festivals, and boat shows throughout the year to inform the public about the San Francisco Estuary. The SFEP handed out ANS brochures and showed samples of invasive species to the public. In addition to other brochures, SFEP distributed the following (sponsors are in parentheses):

- *The San Francisco Bay-Delta Estuary Under Siege: Aquatic Invasive Species* (SFEP)
- *Threats to the West* (WRP)
- Ballast exchange newsletter (California Sea Grant)
- BW invasions poster and brochure

In 2004, SFEP received funds to assist in coordinating the *Caulerpa* National Management Plan workshop and the International *Spartina* Conference.

Moore highlighted the *San Francisco Bay Exotics Guide*. Andrew Cohen, Ph.D. of the San Francisco Estuary Institute, developed the guide, while the SFEP, NOAA, and National Estuarine Research Reserve funded it. The guide contains extensive pictures and species information. A beta version is available at www.exoticguide.org.

The SFEP plans to continue working on advisory panels and educational efforts, promoting existing national programs such as Habitattitude™ and Stop Aquatic Hitchhikers!, creating an awareness network with watershed groups with the USFWS, and developing a prototype ANS early detection booklet with WRP funding.

When asked whether there was any active aquaculture in the bay, Moore responded that there wasn't at this time. He would like to see it return in the future.

Gulf States Marine Fisheries Commission

Ron Lukens, GSMFC, talked about the commission, a five-state compact that was primarily organized and established to deal with interstate fisheries issues and interact with the federal government. The GSMFC has no formal ANS program but is doing a number of things concerning ANS:

- The GSMFC administers and coordinates the GSARP.
- The GSMFC manages the panel's website, which takes time to keep relevant and current.
- Restoration funds are used for ANS activities since no money has been budgeted for an invasive species program.

In the past two years, the GSMFC has been involved, through the regional panel, in two rapid assessments: the Mississippi Sound and associated drainages and the Mobile Bay drainage. There has been a concentrated field effort, with many people taking numerous samples. This effort has provided a snapshot in time and helped to develop a baseline of the ANS present. Other groups are interested in doing some rapid assessments within the next two years. The GSMFC agreed to develop an Oracle database and has input information funded by the Mobile Bay Estuary Program. The GSARP will manage the data. The hope is to have the database ready for query soon.

The GSMFC was active in promoting legislation and requested language that authorized five commissions to establish regional management programs through NAISA. Lukens noted the distinction between a regional panel and regional program. Primarily, a regional program is not subject to FACA. Lukens predicted that many of the same people would participate in the regional program.

After the ex officio members reported, Lukens was asked to further clarify the difference between regional management programs and regional panels. Lukens responded that the regional panels are already planning activities, establishing priorities, and recommending research needs. All of the tasks are funneled through the ANSTF. The objective of the regional program is to engage state and federal agencies to actually implement actions recommended by the GSARP. Federal funding for these actions comes from the USFWS and NOAA under NAISA.

He was also asked whether the Oracle database is site specific or whether it could serve as a model. He hoped that it could be used as a model. He said that they are asking people to look at the format of the Oracle database and use that format to guide their data collection to facilitate data entry.

Mississippi Interstate Cooperative Resources Association

Doug Nygren, USFWS, gave an update on MICRA's ANS activities. Twenty-eight groups came together to deal with issues in the Mississippi River Basin and restore populations. Over time, ANS has become a bigger issue. MICRA currently has a USFWS employee, Jerry Rasmussen, as coordinator. Over the past year, MICRA has participated in many activities:

- MICRA continues to host the MRBP.
- As chair, Nygren represented the MRBP at the GSARP meeting in Biloxi, MS.
- Coordinator Rasmussen presented on Asian carp impacts at the Southeastern Association of Fish and Wildlife Agencies Fish Culture Committee meeting in Virginia Beach, VA.
- Coordinator Rasmussen talked about exotic species in the Mississippi River Basin at the Upper Mississippi River Conservation Committee meeting in Dubuque, IA.
- Coordinator Rasmussen participated in an ACOE-sponsored upper Mississippi River fish passage meeting to let planners know of MICRA's concern regarding any fish passage device that further enables the spread of Asian carp.

- MICRA continues to play an active role in the development and review of the Asian carp management plan.
- MICRA continues the call to action for solutions to the ANS problems associated with the connection between the Mississippi River Basin and the Great Lakes via the Cal-Sag canal and Chicago sanitary and ship canal. In February, MICRA contacted 242 Congressional delegates and 28 governors in the Mississippi River Basin, informing them of MICRA support for full federal funding through the Water Resources Development Act for the operation and maintenance of the ANS barrier in the Chicago sanitary and ship canal and for a study to find ways to biologically separate the Mississippi River Basin and Great Lakes ecosystem.
- MICRA became an affiliate member of the Midwest Association of Fish and Wildlife Agencies. Coordinator Rasmussen presented an Asian carp update to the association, which ultimately resulted in passage of Resolution 4, "Supporting Development of a Multi-National Screening Process for Invasive Species Introductions into North America," by IAFWA. The language of this resolution is included in the briefing booklet.

ANSTF Committee Reports

Detection and Monitoring

Pam Fuller, USGS, reported that she and Greg Ruiz, Smithsonian Institute, are co-chairs for the Detection and Monitoring Committee. The committee has set up a protocol database with funding from USGS through Sharon Gross. To develop the database, the committee compiled over 200 protocols, mostly for invertebrates and fish. This database serves as a place to start and can be accessed at <http://nas.er.usgs.gov/queries/protocols>. Fuller displayed a screen capture of the database that showed the different queries possible.

The Detection and Monitoring Committee meeting was held on March 22, 2005. It was decided that the best way to solicit expert opinion on protocols was to use working groups focused on particular taxa. Members broke up into several working groups: statistical and study design, benthic invertebrates, plankton, plants, fishes, and other vertebrates.

The first step was to decide what species and/or communities needed established sampling protocols. Species to be considered were those with the potential to expand their range and cause harm. The fishes group came up with a list of candidate species: bighead/silver carp, grass/black carp, cichlids, swamp eels, snakeheads, lionfish, red shiners, round goby, ruffe, white perch, rainbow trout, brown trout, largemouth bass, smallmouth bass, green sunfish, bluegill, channel catfish, blue catfish, flathead catfish, and northern pike. Some people thought that game fishes should be included. Other vertebrate candidate species included the Cuban treefrog, bullfrog, greenhouse frog, coqui, aquatic turtles (red-eared slider and softshells), and nutria. Fuller requested that anyone with additional input contact someone on the committee. The committee is also looking for working group members, so interested people could contact Fuller.

The ANSTF Detection and Monitoring Committee maintains a bulletin board for discussions and conducting business. It is accessible at www.bulletinboards.com/cftree.cfm?comcode=ANSTF. In addition to pointing out the member list and March 22 meeting minutes in the briefing booklet, Fuller commented on the NAS Alert System developed by USGS to track the spread of invasive species nationwide. The system allows users to report nonindigenous and invasive aquatic species they sight, receive e-mail alerts, or perform searches on aquatic species.

Web Page Working Group of the CEO Committee

David Britton, USFWS, updated participants on efforts of the Web Page Working Group of the CEO Committee. There has been considerable interest in revamping the ANSTF website since the current website is irregularly updated, has broken links, and contains outdated information. The objective is to develop and maintain a useful website while keeping the content viable, current, and correct. The ANSTF, regional panels, and committees are responsible for ensuring that the website has what they need.

The purpose of the ANSTF website is to provide information and serve as a tool for communicating with one another and the public. Important information that should be included on the website are meeting dates, notes of the ANSTF and regional panels, state management plans, species-specific information, and ecological surveys.

Britton then previewed the eight categories that make up the website structure. These categories in turn have several subcategories. “What are ANS?” will contain a definition of invasive species, species fact sheets, and a list of papers on ecological and economic impacts of invasive species. The category about the ANSTF will contain a detailed description of the task force, a link to NANPCA, an updated list of activities and accomplishments, the strategic plan, and a link to the report to Congress. Task force business will probably be included in the category above and contain lists of members, ex officio members, and committees; the agenda of the next meeting and minutes of the last meeting, a link to regional panels, and a link to state plans. The link to the state plans subcategory will include guidelines for creating state plans. The prevention category will contain information about BW, HACCP planning, the 100th Meridian Initiative, the Stop Aquatic Hitchhikers! campaign, and Habitattitude™. The next category for the management and control plans will contain ANSTF-approved plans and plans under development. When available, this category will include USFWS- and NOAA-sponsored workshops. The education category will also link users to information about the 100th Meridian Initiative, the Stop Aquatic Hitchhikers! campaign, and Habitattitude™, as well as to information about water gardens and introduced species. It will also include links to member pages. The research category will contain a list of research papers, including BW grants. The final category, regulations, will contain NANPCA, the Lacey Act, USCG regulations on BW, the Federal Plant Act, and international and proposed regulations. There will be links to the full text of the regulations.

Britton then displayed a mock-up of the website. Navigation buttons will be down the left side, with the text in the main body. The site will be more graphically oriented, with pictures and a short profile of the species of concern.

After the presentation, members discussed maintenance of the website and software to help check for broken links. The working group will also solicit information on as many ANS as possible and compile that information into a standard format for posting at this website. Following discussion, the ANSTF approved continued work on the content and structure of the website. Britton expected the website to be operational within a few months, depending on some web-hosting tasks and pending approval by the ANSTF.

Pathways Task Team of the Prevention Committee

Sharon Gross, USGS, gave the Pathways Team progress report. The “Pathwayers” is one of the task teams overseen by the Prevention Committee, a joint committee of the ANSTF and NISC. Penny Kriesch, APHIS, chairs the Pathwayers, while Gross serves as the liaison to the full Prevention Committee.

The main objective of the Pathwayers is to collate information regarding pathways. This effort includes looking at processes for identifying and ranking the pathways and for keeping new

information coming in. Since the team report was issued on October 29, 2003, the team has had numerous accomplishments:

- Amended the pathways assessment tool and diagrams based on cross-agency comments and a trial period.
- Collaborated with National Agricultural Statistics Services statisticians for validity evaluation of assessment instruments. (The assessment tool was revised and informally retested with a focus group.)
- Created a library of relevant scientific papers and periodicals on pathway issues through research of NISC files and an annotated bibliographic search.
- Created an information-sharing website. (She isn't sure whether it is available to the public or just for internal use.)
- Developed an expert list for pathway analysis (still in progress).
- Designed a method for conducting pathway assessment.
- Started development of an inventory of databases to support the quantitative assessment portion of pathways. (The intent is to cross-matrix/data-mine pertinent databases.)

The Pathwayers will conduct the first prioritization focus groups on June 21–22, 2005. At this workshop, the team will evaluate three different pathways and apply the assessment tool to those pathways. The process for pathway risk evaluation is to formulate expert focus groups of all vested parties for each pathway, use pathway-based risk factors for qualitative evaluation, supplement expertise via the most current research available, and augment research and expertise with succinct pathway data sets. The experts will analyze relative risks and jointly prepare recommendations for decision-makers regarding pathway risks, including points of integration, cooperation, and gaps. This is an “open system” wherein new pathways and pathway evaluation factors may be continually added or revisited based on current needs, trends, and research.

Both qualitative and quantitative analyses are needed, with the first being qualitative. For this analysis, cross-agency and industry scientific experts will be guided through a series of analytical evaluative questions. Quantitative analysis involves data mining, during which they will inventory pathway-specific invasive species; develop a risk-based geographical list of hosts and habitats conducive to invasive establishment; find port of entry locations and detections; find invasive origination points; trade databases for prediction of potential invasive trends; and access official control and regulatory event databases.

Gross summarized that the short-term goals are to validate the assessment tool using three pathways during the June meeting, develop information tools for decision-making, and create an integrated information network for data mining. The long-term goal is to develop a process or method for continual evaluation, coordination, information gathering, and response relevant to invasive species pathways. Some challenges are creating a common language, concept, understanding, and approach to invasive species pathways across government and industry and ensuring that timely and appropriate information is disseminated to all key decision-makers. After revising the assessment tool, the Prevention Committee will present results to the ANSTF and NISC.

Research Committee¹

Dorn Carlson, NOAA, reported on the activities of the ANSTF's Research Committee. The committee has developed a membership roster and identified committee roles and responsibilities. These roles and responsibilities include updating, maintaining, and disseminating research protocols to ensure that AIS research does not contribute to the spread of AIS; identifying AIS research needs by regional panels, committees, and member organizations; facilitating coordination of AIS research through sharing information, contributing to the ANSTF annual report, and coordinating execution of research mandates given to the ANSTF; and accomplishing other duties as assigned by ANSTF co-chairs.

The first meeting of the Research Committee is scheduled for July 12, 2005, at NOAA headquarters in Silver Spring, MD. Agenda items include the ANSTF charge, membership, roles and responsibilities, structure and ground rules, working groups, action items, and next steps. Co-chairs of the ANSTF have been invited to attend this meeting to give a charge to the Research Committee members.

Possible working groups will be based on roles and responsibilities, such as identifying research needs and coordinating research. Working groups will include existing grassroots working groups such as those for BW technology and extramural research grants.

Economic and ecological research has already been identified as areas of need, and some possible working groups have been presented. A current group working on BW issues has been identified as a possible Ballast Water Technology working group. It includes the Navy, USCG, USGS, USFWS, MARAD, NOAA, USEPA–Office of Water, USEPA–Office of Research and Development, National Science Foundation, SERC, states, and NGOs. The goal is a nationally coordinated BW technology program. The working group will find areas of common and complementary interest and expertise, facilitate communication and standardization toward technology development and testing, and share special skills and resources. An investigators' workshop is planned for this fall.

Another current group, Extramural Programs for Research on Invasive Species, has been identified as another possible Research Committee working group. Members of this group include the USDA–Cooperative State Research, Education, and Extension Service; USDA–Economic Research Service; USEPA; National Science Foundation; NOAA; and Heinze Center. The goal is coordination and possible collaboration in extramural grant programs. The working group will select a pilot focus area that integrates economic and ecological research in invasive species. An expert workshop is planned for July, and an investigators' conference for this fall. A multiple-agency request for proposals is a possibility.

State Management Plans

Two newly completed state management plans. Will have decision point of approving the plans or

Kansas

Jason Goeckler, ANS Coordinator for the Kansas Department of Wildlife and Parks (KDWP), was pleased to talk about the Kansas aquatic nuisance species management plan and hearing comments. The purpose of the plan is to protect Kansas residents from harmful impacts of invasive species. State participants include KDWP, Kansas Department of Agriculture (KDA), Kansas Department of Health and Environment (KDHE), Kansas Biological Survey, and Kansas Water Office (KWO), all major players in the state for ANS issues. Federal participants include the ACOE, USFWS, USCG, USCG

¹ The update on the Research Committee was actually provided on May 26. However, for organizational purposes, this update is provided here with the other committee reports.

Auxiliary, and U.S. Bureau of Reclamation. Private participants include Great Plains Energy, Wolf Creek Nuclear Operation Corporation, and Westar Energy. These last three organizations have funded most of the process so far.

There are four Kansas ANS authorities: KDWP, KDA, KDHE, and KWO. The KDWP developed a dynamic list of prohibited species and banned the release of exotics, the stocking or release of wildlife on department lands or waters, and the transfer of baitfish. The KDA issued its first ANS plant quarantine in 2002. In 2004, it quarantined 19 aquatic plants, which was the first large-scale effort to control ANS. The KDHE historically documented the presence of ANS in field notes maintained in a searchable computer database. However, the Chemical Control Act identifies the KDHE as the department with regulatory control over toxins that may be used to control ANS. The KWO wrote the *Kansas Water Plan*, one of the primary tools used to coordinate the management, conservation, and development of state water resources. The KWO is also responsible for state basin plans, which can include a management strategy for addressing ANS, including technical information and public education.

Kansas has 76 introduced species. Zebra mussels were found in El Dorado Reservoir in 2003. The population is growing, but no new introductions have been discovered. White perch are in two reservoirs and two lakes in Kansas. Bighead and silver carp species have been found, but neither the black carp nor the New Zealand mudsnail have been found. Purple loosestrife is widespread in the eastern part of state, and saltcedar (tamarisk) is present in the west. No reports of Eurasian watermilfoil have been confirmed, but last month, a Chinese mystery snail population was discovered. [In July, following this ANSTF meeting, a population of Japanese mystery snails was discovered in one lake.]

ANS management goals are to coordinate ANS management activities; prevent the introduction of ANS; detect, monitor, and eradicate ANS; control or eradicate established ANS; educate all aquatic users; and support research and disseminate information. Educating aquatic users is a main component of the Kansas ANS management plan.

ANS management activities will be coordinated by implementing an ANS management program, creating and funding an ANS coordinator position, coordinating and collaborating management activities with Kansas and beyond, and developing a permanent funding mechanism. The management plan promotes identifying ANS with the greatest infestation potential to help prevent new ANS introductions. To detect and eradicate ANS, the management plan promotes implementing a surveillance program, developing an early response device, and eradicating pioneering populations. Detection activities already in place include the presence of Portland samplers in all water bodies that the state manages and veliger sampling in El Dorado Reservoir. The Stop Aquatic Hitchhikers! signs have been posted at all boat ramps in Kansas. Some boat inspections are conducted and used as a conduit for education. Limiting dispersal of established ANS and developing human adaptation activities would help control current populations. The state has developed signs that are now in bait shops, used the 100th Meridian Initiative brochure, and developed a brochure for zebra mussels to help educate the public. To further educate aquatic users, ANS education materials will be developed and ANS identification information distributed to the public and to staff. The management plan will support prevention and management research and distribute research data to managers.

Goekler requested assistance with, and approval of, the management plan. Members asked why nothing was listed in the plan's funding. Goekler noted that each line is not filled in because funding is grouped. ANSTF members are to get comments on the Kansas plan to the Executive Secretary by July 1, 2005.

North Dakota

Lynn Schlueter, North Dakota Game and Fish Department, had a brief presentation about the North Dakota ANS management plan, which was started in June 2004 and signed by Governor John Hoeven in February 2005. He appreciated the opportunity to present this plan to the ANSTF. He said that North Dakota understood problems that other western states have with ANS, especially given the importance of recreation and angling in the western state. North Dakota receives considerable angling use by visitors from throughout the Midwest. A number of stakeholders participated in development of the plan, including state agencies, the Department of Agriculture, State Water Commission, outfitters and guides, power companies, and others. He believed the plan to be effective because it was straightforward, adhering to North Dakota's philosophy of being "simple, effective, and using resources wisely."

The plan was the impetus for passing a state law regarding ANS. The State Senate voted 47 to 0 in favor of the bill, while the House of Representatives favored it by 96 to 2. The passed bill recognized the value of having an ANS plan and establishing a list of nuisance species. Schlueter commented that education is the primary method of preventing ANS spread, and the state has already initiated a tremendous education system regarding ANS. An appendix to the plan listed 2004 accomplishments. He is working with friends in the marketing field to target outreach audiences. Although the plan was not yet approved by the ANSTF, Schlueter asked for approval and continued funding.

Schlueter was praised for the proactive nature of the plan, as well as its inclusion of a rapid response component. Discussion focused on the timeline for ANSTF review and comment, as well as the extent of revisions that could be made without the governor having to sign the plan as well. In the future, ANSTF members would like the opportunity to comment on a draft plan before the final is submitted to a state's governor for signing. Because the plan was submitted to the ANSTF in February, comments should be submitted to Don MacLean by June 15 to comply with the 90-day comment period. Schlueter agreed to go through comments and suggested revisions, make possible changes, and then discuss the changes with state agencies to determine whether the plan could go forward without being resubmitted to Governor Hoeven. The ANSTF voted for provisional approval of the North Dakota plan, pending editorial changes due June 15. If changes are major, the ANSTF will have to revisit the plan.

Specific input provided during discussion included the following issues and suggestions:

- For implementation, Schlueter could take advantage of the wealth of materials already developed and available, such as HabitattitudeTM and Stop Aquatic Hitchhikers!
- The plan does a good job of describing the rapid response process but lacks lists of people who need to be notified, regulatory agencies to contact for specific issues such as piscicide use, and regulations that must be considered. Wilkinson called this component the "series of lists" that are necessary for the plan.
- The state identified 22 sources of ANS in North Dakota and focused on audiences associated with those 22 sources. Schlueter called on educators for help in understanding how to direct information to these audiences.
- The plan does address the transfer of ANS from North Dakota to Canada as a result of water diversions.

Regional Panel Reports

Great Lakes Regional Panel Update

Mike Hoff, USFWS, reported on the accomplishments and direction of the GLP. GLP leadership is driven by state representatives that are elected every two years. The chair must be a representative from a state natural resource agency, while the vice-chair can be drawn from the broader pool of GLP members. GLP staff are GLC members. The chair position is held by Roger Eberhardt, Michigan Department of Environmental Quality, Office of the Great Lakes, and the vice-chair is Marc Tuchman, USEPA, Great Lakes National Program Office.

The panel has an executive committee and three standing committees: Information and Education; Policy and Legislation; and Research Coordination, which will be renamed the Regional Coordination Committee.

An organizational strategy and operational guidance document being developed by the Executive Committee in response to section 1203 of NANPCA (1990) is available online at www.glc.org/ans/pdf/05-04-11_opguidance.pdf. The final document will contain the mission and governing principles of the GLP; membership selection and approval processes; roles and responsibilities of the officers, including the panel chair, vice-chair, and chairs of standing committees; eligibility criteria for officer positions; voting procedures; and structure and function of the Executive Committee, standing committees, and ad hoc committees. Staff support included in the final document will be the communication network, panel meeting conduct, newsletter publication, ANSTF meetings, standing committees, and administrative duties. A detailed section concerning GLP meetings will discuss frequency of meetings, FACA requirements and public comments, the quorum required for making decisions, meeting conduct, and panel decision-making between meetings. Finally, the document will include recommendations to the ANSTF, guidelines for advocacy and funding, an annual work plan for the panel and standing committees, and guidelines for amending the document.

Some issues are still outstanding for the guidance document. Additional information is needed for the mission statement, and additional detail needed on the selection of panel members. Roles and responsibilities of the Executive Committee need to be better defined, particularly regarding decision-making. A description of the roles and responsibilities of the standing committees, their work plan development, and a recommended name change of the Policy and Legislation Committee need to be reconciled. The decision of when to use consensus or majority voting needs to be made, and clarification is needed on how to position GLP recommendations so that they are not regarded as advocacy.

Other panel initiatives include priority setting, which will be established through a panel committee process. The purpose of priority setting is to help plan panel activities and work and to describe panel priorities to the ANSTF. Each standing committee is defining priorities on the AIS issue for the Great Lakes region. The priorities document for the Information and Education Committee is in draft format and being refined by the committee members. The Research Coordination Committee's priority document was approved during the April 2004 panel meeting, while the Policy and Legislation Committee is in the preliminary stages of development.

The panel produces a semiannual newsletter, the *ANS Update*. The last two issues focused on the USCG push for BW solutions and new challenges in preventing the introduction and spread of ANS in the live food fish industry.

The Great Lakes Regional Collaboration is not a panel initiative, but many members are involved. This collaboration was created by EO 13340, signed by President Bush on May 18, 2004. The EO authorized two efforts: a Great Lakes Interagency Task Force and promotion of the Regional

Collaboration of National Significance for the Great Lakes. In December 2004, members of the collaboration affirmed their commitment to a collaborative process and development of a comprehensive strategy to further protect and restore the Great Lakes by signing the *Great Lakes Declaration* and *Framework* documents. The goals of the collaboration are to build on existing collaborative efforts, serve as a forum to address near-term regional issues, and create an oversight forum to coordinate and enhance implementation of the strategy. Eight strategy teams have been formed to develop action plans on issues of basinwide concern: nonpoint-source pollution, areas of concern, persistent chemicals, habitats and species, information and monitoring, coastal health, sustainable development, and aquatic invasive species.

Co-chairs for the AIS strategy team are Chris Goddard, Great Lakes Fishery Commission, Ken Debeausaert, Michigan Office of the Great Lakes, and Gerry Jackson, USFWS. This team was formed to address the Council of Great Lakes Governors' priority to "stop the introduction and spread of non-native aquatic invasive species." AIS vector drafting teams will address aquaculture, maritime commerce, canals and waterways, organisms in trade, and recreational activities. The five key recommendations for the collaboration's AIS strategy team action plan are maritime commerce; canals and waterways; the trade of live organisms; early detection, rapid response, control, and management; and education and outreach. Several upcoming dates are important for the AIS strategy team:

- May 27 The AIS strategy team will submit its action plan to the Great Lakes Regional Collaboration's Executive Committee.
- June All eight strategy team documents will be collated into a draft *Strategy to Protect and Restore the Great Lakes*.
- July The master draft will be released for public comment, and Summit I will be held July 7–8 in Duluth, MN.
- August 31 The public comment period will end.
- December 12 Summit II will be held in Chicago, IL, and the final strategy document released.

Hoff displayed graphs of the cumulative number of nonnative species established in the Great Lakes by decade and the raw number of nonnative species established per decade. There are now about 182 nonnative species in the basin.

Hoff suggested that people wanting additional information read the briefing booklet, go to www.glc.org/ans/panel.html, or contact Kathe Glassner-Shwayder at shwayder@glc.org or Marcia Woodburn at woodburn@glc.org.

Gulf and South Atlantic Regional Panel Update

Ron Lukens, GSMFC, reported on the activities of the GSARP. The panel's most recent meeting was held May 12–13 in Key West, FL, in conjunction with the Florida Aquatic Pests Council. For 20 years, this group had been working to combat the impacts of nonnatives in southern Florida.

State plans for Texas, and Louisiana have been completed and submitted to ANSTF for review. Florida has completed an "Invasive Species Management Plan (both terrestrial and aquatics) and May seek approval from the Task Force on the aquatic portion of the plan. The plan for Mississippi is in progress, with a projected completion date of June 2006. Alabama has yet to start but has an agreement from a state agency to develop a plan. Although the regional panel has expanded its membership, Lukens did not have information from Georgia or North Carolina regarding their plans. Maryland is working on developing a state plan.

The GSARP's strategic plan is in the final draft stage. It has five goals, 24 objectives, and 59 tasks. Lukens encouraged anyone interested in reviewing that plan to contact him. He then distributed a

handout of the 2005 work plan. The strategy is to hold teleconferences with the work groups to see how each would like to complete the tasks listed in the strategic plan. A training workshop on risk assessment is scheduled for late August in Tampa, FL. The training will accommodate 45 to 50 people and teach them how to turn a product into a policy or management decision. The ultimate goal is to have a large cadre of people, not all federal or university members, available to do risk assessments. If there is enough interest, the MRBP will host a similar workshop.

The regional rapid response plan has been completed and submitted to Dorn Carlson, NOAA. Lukens thanked those responsible for completing the plan since each state needed to establish a state-specific plan before it could be incorporated into a regional panel structure.

It was reported at the fall 2004 ANSTF meeting that Georgia and South Carolina had requested membership to the GSARP. Lukens said that he would get the contact information for representatives to these states to Don MacLean, USFWS.

GSARP members are concerned that some U.S. ports are seeing fewer inspections because of the large portion of APHIS agents being transferred to the DHS, a situation that increases the risk ANS being introduced into the United States. The panel did not disagree with the transfers but believed that the frequency and intensity of inspections should be maintained.

Lukens also believed that ANSTF expectations for format and content of the annual report were unclear and recommended that the ANSTF finalize reporting requirements since part of the panel's mission is to submit an annual report to the ANSTF describing activities related to ANS prevention, research, and control.

The GSARP has tentatively adopted a logo that meets members' desire for one that is simple, readable, and reproducible. The next panel meeting is tentatively planned for the last week of October and will probably be held in Corpus Christi, TX.

During the question and answer period after the regional panel reports, Lukens requested that the ANSTF not penalize Florida for developing a state management plan for all invasives rather than just aquatic invasives. The plan has strategies specific to AIS. Wilkinson had no objection to Florida's including terrestrial invasives but believed that the ANSTF should comment on the aquatic components of the plan only. Don MacLean added that the state was probably not seeking funding but would like ANSTF approval of the plan. He suggested that, for states just beginning to develop plans, the ANSTF guide them to split terrestrial and aquatic species so that it's easier to ensure adherence to provisions of NAISA and get funding.

Mid-Atlantic Regional Panel Update

Julie Thompson, USFWS, talked about MARP activities. The panel had its first meeting March 31 and April 1. The first day consisted of an overview of the ANSTF presented by Don MacLean, USFWS. Ron Lukens, GSMFC, and Kathe Glassner-Shwayder, GLC, also shared perspectives on their regional panels (the GSARP and GLP, respectively). Marshall Meyers, PIJAC, and Joe Starinchak, USFWS, spoke about ANSTF outreach programs. On the second day, participants worked on determining the scope of the panel, the structure and operation of the panel, and elements of the panel work plan.

Several regional priorities were identified:

- The panel needs to develop criteria for project funding.
- The panel needs to focus on issues and species that are common throughout the mid-Atlantic region.

- States in the panel need to develop and implement state ANS plans. The Pennsylvania state plan is in the initial stages of development, Virginia will have a state plan developed under state legislation that can be adapted to an ANSTF plan, and Maryland has no state plan.

MARP members also formed three working groups: Science and Management, Policy and Legislation, and Outreach and Education. Jim Grazio, Pennsylvania Department of Environmental Protection, was appointed the lead of the Science and Management Working Group; Ann Faulds, Pennsylvania Sea Grant, was appointed the lead of the Outreach and Education Working Group; and Sarah Whitney, Pennsylvania Sea Grant, was appointed the lead of the Policy and Legislation Working Group. Each working group developed long-term goals, short-term goals, and action items for the annual work plan.

The meeting included considerable discussion about how decisions were made and who could vote. It was decided that the panel needed to have some standard operating procedures, which were drafted and sent out for review. Elections will occur via e-mail, and nominations for chair and co-chair will be requested in June. The chairs will serve a two-year term and can serve two consecutive terms. Jennifer Greiner, USFWS, is the interim chair.

MARP has a website housed within the CBP website, which can be located at www.chesapeakebay.net/marp.htm. Detailed minutes from the first meeting are included on this website.

After the regional panels reported, Thompson was asked how the Chinese mystery snail could be eradicated. She responded that they are considering options. Because almost any activity will require a permit from some state agency, they view this process as a pilot for obtaining general permission. Dean Wilkinson, NOAA, suggested that she contact the State of Michigan about the *Hydrilla* rapid response plan. Mike Hoff, USFWS, also suggested contacting the Great Lakes Commission since the Michigan plan is really conceptual. Judy Pederson, MIT Sea Grant College Program, recommended Dr. Lars Anderson, USDA–Agricultural Resource Service, as a resource.

Northeast Regional Panel Update

Judy Pederson, MIT Sea Grant College Program, delivered a presentation on recent NEANS activities. Pederson is the NEANS panel co-chair with John McPhedran, Maine Department of Environmental Protection. Michele Tremblay, naturesource communications, is the program manager. The panel is hosted by the Gulf of Maine Council on the Marine Environment.

NEANS membership includes the northeastern states of Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont, as well as New Brunswick, Nova Scotia, and Quebec. The panel hopes to formally include Prince Edward Island. Pederson noted that NEANS has trouble getting representation from Canadians at the meetings because of funding limitations.

The panel's mission statement is "to protect the marine and freshwater resources of the Northeast from aquatic nuisance species through commitment and coordinated action." Its goals include preventing the introduction, establishment, and dispersal of aquatic nuisance species in the Northeast; controlling the spread of aquatic nuisance species already introduced into the Northeast; and mitigating the harmful ecological, economic, social, and public health impacts associated with the introduction, establishment, or spread of aquatic nuisance species in the Northeast. Bylaws were adopted on May 17, 2004.

Objectives of the panel's operational framework include regional coordination and leadership for programs, regional support for ANS policies, regional support for regulatory and legislative actions, increased public awareness of the importance of prevention, regional support for basic and applied

research, and a regional clearinghouse for information sharing. NEANS's membership includes representatives of government, military, academia, nonprofit organizations, and private industry.

The panel has four committees: Ballast Water; Communication, Education, and Outreach; Policy and Legislation; and Science and Technology. The CEO Committee has been very active and is currently revising the website. The Policy and Legislation Committee convened a NEANS Panel Workshop, Implementing Rapid Response to Aquatic Nuisance Species in the Northeast: Key Components of a Successful Program. From the presentations and discussions, it was apparent that problems of invasive species are regional, but management is dictated by individual state laws and regulations. One of the outcomes from the workshop was a group consensus that an effort should be made to cooperate and share information within the region. Because *Hydrilla* can become highly invasive, there was agreement to keep it out of the Northeast. This effort will serve as a pilot project to evaluate a collaborative effort among the states and identify key contacts in each state. The Science and Technology Committee met and continued with activities directed at early detection and monitoring and data management. The Ballast Water Committee is focusing on outreach materials for shipping agents to promote reporting and efforts to reduce or prevent new introductions.

Selected panel accomplishments included semiannual meetings with "Spotlight on Species" and professional development features; the *NEANS Panel Resource Digest*; a revised website (www.northeastans.org) and listserv (panel-subscribe@northeastans.org); the May 2005 Policy and Legislation workshop in Portsmouth, NH; the Stop Aquatic Hitchhikers! floating key ring; peer-to-peer coordination on state plan development and revisions; coordination of marine introduced species data; a traveling display; and a hand-pulling brochure for water chestnut. Planned panel activities include a regional BW initiative, outreach program for non-English speaking communities, new order of floating key rings with companion website, revised ANS legislative matrix, list of target species, and rapid response protocols.

Mississippi River Basin Regional Panel Update

In the absence of Jay Rendall, Minnesota Department of Natural Resources, Mike Hoff, USFWS, delivered a presentation on MRBP activities. The MRBP was formed in July 2003 at an organizational meeting held in Bloomington, MN, and covers the largest geographic area (all or portions of 31 states in the Mississippi River Basin) of any of the ANS panels in the nation. Rendall is the panel chair, and Hoff is the vice-chair. An election is planned for the fall of 2005. The greatest challenge of this panel is the diversity of AIS, habitats, people, and agencies. The MRBP includes 47 official members, plus alternates, and 21 other interested parties, including members representing 26 states and provinces and four subbasins.

The fourth MRBP meeting is scheduled for September 7–9 in Wichita, KS. This meeting will be held jointly with the WRP.

Several panel members have participated in other meetings and reported on MRBP activities. Tom Mosher (KS) attended the WRP meeting, Doug Nygren (MICRA) and Hoff attended the GLP meeting, and Rendall and Jerry Rasmussen (MICRA/MRBP) participated in the Midwest ANS Workshop.

Asian carp are the top basinwide ANS problem, followed by the zebra mussel. The first priority of the MRBP is preventing the spread of Asian carp and controlling current populations.

The three standing committees in the MRBP are the Research and Risk Assessment, Education and Outreach, and Prevention and Control committees. They are implementing their work plans, which are included in the briefing booklet.

The MRBP has developed a recommendation regarding barriers and fish passage within the basin to prevent range expansion. The panel recommended incorporating ANS considerations into all actions relating to construction, removal, and bypass of dams and other barriers in the Mississippi River

Basin. Hoff commented that the final draft recommendation was in the ANSTF folder that everyone received.

In partnership with GLP, the MRBP is sponsoring and planning a risk assessment training workshop. The panel is also developing a field guide to AIS in the Mississippi River Basin. This field guide will be completed in the summer of 2005. This document will be 24 pages long and contain 14 full-page profiles and 8 to 12 short profiles.

Hoff displayed a photograph of the old Chain of Rocks Bridge that spans the Mississippi River. When it was completed in 1929, it shortened the travel time and improved communication between Missouri and Illinois. One of its most distinctive features is the 22-degree bend in the middle. Hoff believes that this bridge is a metaphor for this panel: one of the most important accomplishments of the panel has been to improve communication and coordination across states and entities that did not commonly communicate.

Western Regional Panel Update²

Tina Proctor, USFWS, welcomed everyone and thanked Susan Ellis, CADFG, for organizing the second day of presentations. Proctor also thanked Jason Goeckler and Doug Nygren for working on the Kansas state plan and Lynn Schlueter and his boss for completing the North Dakota plan and getting state legislation passed.

Proctor distributed several handouts: the Western Governors' Association Policy Resolution 04-12 about undesirable aquatic, riparian, and invasive species; a resolution from the Western Association of Fish and Wildlife Agencies about state wildlife agency leadership for ANS, and lists of the WRP's 2004 accomplishments and 2005 work plan items.

She discussed the two policy resolutions that had been passed. These resolutions were done in conjunction with the WRP and based on a document presented to the ANSTF in 2003 ("Recommendations for State Actions to Improve Efforts Regarding Aquatic Invasives"). The policies resolved to create a partnership between the three organizations to convene an Aquatic Invasive Working Group to develop and implement a comprehensive program to prevent the spread of ANS in the water resources of 17 western states. In addition, the Western Association of Fish and Wildlife Agencies encourages its member states to adopt the recommendations of the ANSTF including appointment of a state ANS coordinator, establishment of state ANS committees and plans, appointment of a representative from each state to the WRP, establishment of programs with additional resources to prevent the spread of ANS, establishment of early detection and rapid response plans, and establishment of authorities necessary to implement these programs and plans.

With funds from NOAA, the WRP is working to develop a rapid response plan for zebra mussels in the Columbia River Basin. The final document should be completed by August 2005.

Sue Ellis, chair of the WRP, has sought to encourage collaboration and cooperation with Mexico and Canada. Therefore, with \$30,000 to spend in 2005, the WRP is funding four projects. Kevin Anderson, Puget Sound Water Quality Action Team, and Pat Lim, DFO, have been working on a bilateral rapid assessment of ANS in the shared waters of Puget Sound and the Georgia Basin. The SFEP is developing a prototype ANS early detection program for watershed groups. PSU's Center for Lakes and Reservoirs will be hosting a workshop to develop research priorities for invasive aquatic plants in November 2005. The final project is to establish collaboration with Mexico to prevent hull transport of

² The update on the WRP was actually provided on May 25. However, for organizational purposes, this update is provided here with the other regional panel reports.

AIS on the West Coast. Considerable money has been put into this project, but the WRP wants to establish collaboration on written materials that would help both countries.

Proctor closed by noting that the 100th Meridian Initiative, funded through ANS funds, is a very active organization. It has four teams that met regularly and have accomplished a lot. ANSTF members requested a presentation about the 100th Meridian Initiative at the fall meeting.

Regional Research Priorities

Dorn Carlson, NOAA, gave a brief follow-up on a fall 2005 presentation about the biennial Sea Grant competition for invasive species research and outreach grants. At the fall ANSTF meeting, he had asked each regional panel for one or more regional priorities for Sea Grant research or outreach projects, in a specified format. He reminded them about this request since the next RFPs will be coming out in early 2006 to fund projects starting in 2007.

He showed the following example of some priority information submitted to him:

Socioeconomic Analysis (Costs and Benefits): Research on the potential impacts of nonindigenous species on human health in terms of spread of disease, concentration of pollutants, and contamination or purification of drinking water sources. Economic impact on sport, commercial and tribal fisheries, the recreation and tourism industry, the shipping and navigation industry, and municipal and industrial water users. Use of research results to provide a scientific basis for developing sound policy and environmental law, and for public education and technology transfer.

He knows that some panels have started talking about regional priorities to provide for the RFP, many drawing from recent or ongoing research and outreach prioritization activities. Carlson invited the ANSTF and regional panels to consider discussing regional priorities at the fall 2005 ANSTF meeting.

Carlson commented that, at the fall 2004 meeting, participants had mentioned their concern that regions without marine, Great Lake, or coastal resources are unable to submit project proposals. He had hoped to partner with some other grants people on some inland projects. Unfortunately, he has received no commitments of interest at this time. So he suggested that people tie projects to the coast or Great Lakes or submit projects that are not location specific in nature such as developing a forecasting model. He encouraged people to contact him for more discussion and expressed his willingness to talk with the regional panels about this opportunity.

Carlson also talked about another grant competition. NOAA, the USFWS, and MARAD run an annual competition for BW technology demonstration grants to fund one- or two-year projects that develop, demonstrate, or conduct research in support of BW treatment technologies. Congress directs that the bulk of funding emphasize the Great Lakes, Chesapeake Bay, or both.

Assessment of this program has led to several improvement goals, including better long-term continuity in projects, more use of common test protocols to facilitate comparison of results across projects, more and better standardized quality control in experiments, more independence between investigators and vendors, and more engagement of ship and port interests. For the last goal, they also look to the regions for input.

For 2006, the sponsoring organizations are working on developing a new program initiative, specifically a competitive multiple-year cooperative agreement to set up and operate a regional research, development, test, and evaluation (RDT&E) facility initially targeting the Great Lakes. There will be competitive startup grants for groups in other regions to build capacity to establish other regional sites in the future. Individual project grants are planned to continue.

Carlson commented that 12 projects were proposed in 2005. These projects addressed several treatment technologies (deoxygenation, microwave energy, filtration, ozone, sonic energy, and monitoring/verification), chronic toxicity testing of BW biocides, technology assessment, and computational modeling of an outreach campaign to implement best management practices. Results haven't yet been awarded.

When asked about the part that regional priorities will play in the awards, Carlson said that the competition will still accept and consider proposals that don't address regional priorities. He believes that about half the funding will go to regional priority projects. During the review process, six categories will remain, and then others will more likely be funded if they meet a regional priority over one that doesn't. Wilkinson added that, even with regional priorities, all proposed project have to go through a peer review process. If no proposals meet regional priorities or if a bad proposal comes in, peer review panels are instructed to rate a proposal in terms of its technical merit. It is possible that some regional panel priorities might not be met and something outside a regional priority could be funded because of the peer review process.

NOBOB Research Project

David Reid, NOAA, summarized results from the Great Lakes NOBOB assessment. This assessment, last reported on in November 2002, is now complete. Participating institutions included NOAA, University of Michigan, University of Windsor, Old Dominion University, SERC, and Philip T. Jenkins and Associates. Financial support was provided by Great Lakes Protection Fund, NOAA Invasive Species Program, USEPA, Great Lakes National Program Office, and the USCG. Considerable assistance and cooperation also came from the shipping industry, especially Fednav, Polsteam, and the Great Lakes ship agents. The final report is available on the website (www.glerl.noaa.gov/nobob/), although it is still subject to minor revisions.

Program objectives included three tasks: assessment, in-tank hatching experiments, and BWE effectiveness. The assessment had four goals: characterize the biota in ballast tank residuals; assess sediment accumulation vs. ballast management practices; isolate and evaluate the viability of eggs, cysts, and spores; and examine foreign vessel traffic data. The two goals of the in-tank hatching experiments were to conduct time-series sampling in NOBOB ballast tanks refilled in the Great Lakes and compare laboratory resting-egg hatching observations with *in situ* experiments. BWE effectiveness was run by SERC to evaluate the efficacy of mid-ocean exchange in removing coastal organisms from low salinity ballast.

For task 1, 42 NOBOB vessels were sampled, 82 ballast tanks were entered to collect residuals, and 103 ships were boarded to assess ballast and sediment management practices and residuals. Results indicated that considerable effort was being made to minimize residuals, especially sediment. Approximately 60% of the ships sampled had less than 10 metric tons (MT) of sediment residuals. Furthermore, crews were generally aware of NIS issues. "Swish-and-spit" was the most common practice to keep double bottom and hopper side tanks clean, and regular flushing (each leg, every opportunity) was associated with less sediment accumulation. Interestingly, 31 of 49 ships (63%) that last ballasted in fresh or brackish water had not flushed or exchanged. These vessels, carrying fresh or low-salinity residuals, pose the greatest risk and are more likely to result in new introductions via NOBOB operations. Two of the 49 ships that last ballasted in fresh or brackish water were treated with chlorine in South America, as required for preventing cholera. One or more pathogens were detected in residuals from 26 of 42 ships and 40 of 82 tanks sampled. Although there was no evidence that NOBOB residuals were a significant source of disease, all ships should be viewed as potential carriers of pathogens, and focused assessments of pathogens in ballast tanks and ballast tank discharges are needed to determine actual risk to human health.

For easy reference, acronym and species lists are included at the end of this document

Time-series analyses of the total bacterial cells and virus-like particles showed no apparent incubation. Viable phytoplankton species included 30 that were NIS and grew in freshwater treatments, of which 9 were already found in the Great Lakes. NIS comprised less than 5% of organism abundance in most samples, and salinity did not act as a filter. Over 200 live or viable invertebrate taxa of zooplankton were identified. Higher salinity and lower temperatures suppressed total abundance and species richness. However, it was dependent on and variable with taxa. Hatch rates were much lower if eggs were isolated by burial in sediment, and total abundance and species richness were significantly reduced by burial. Based on the average sediment volume and ballast tank surface areas, sediments such as those tested could release 7,000 to 10,000 individuals from a single ship. However, on average, only 2.5% of the eggs were nonindigenous.

A comparative risk analysis of invertebrates suggests that residual freshwater ballast poses the greater risk because live taxa in the water column have a higher likelihood of being swept out when deballasting.

Reid concluded that NOBOB tank residuals are a vector for nonindigenous species introductions to the Great Lakes, and residual water may pose a greater invasion risk than residual sediments. No evidence indicated that NOBOB residuals are a significant risk to human health. Some organism abundances were negatively correlated with salinity and tank flushing, suggesting that increasing salinity and/or flushing tanks may lower the risk of ANS introductions.

During task 3, salinity and the nontoxic water tracer dye Rhodamine WT were used to measure the effectiveness of BWE in removing the original water mass from the tank. Analyses of both tracers yielded high exchange efficiencies for water volume replacement, generally greater than 95%, but slightly less effective replacement of coastal organisms, ranging from 80% to 100% depending on the organism. So, contrary to some previous studies, BWE was found to be highly effective at removing water and removing or killing many biological tracers. More information is needed to evaluate the effectiveness of salinity shock since experiments have revealed that estuarine taxa have variable tolerances and some can survive prolonged exposure to higher salinities.

Reid said that this project does not provide all of the answers, but it provides a viewport-size look at a complex environment. It also confirms that NOBOBs are significant vectors for transporting nonindigenous species to the Great Lakes. A better assessment of pathogen occurrence in tanks is needed to assess the human health risk. The NOBOB team is doing a follow-on project to assess the effectiveness of certain management practices, especially the effects of saltwater flushing on residual organisms.

Armored Catfish

Al Cofrancesco, ACOE, talked about suckermouth and sailfin catfishes. A research project in the San Antonio River of Texas provided the impetus for a larger project. Armadillo del rio has been documented in the United States since the 1950s. Worldwide there are about 100 species in the genus, with three different species in this country. These fish are small and often used in aquariums to control algae. Three species of sailfin catfish also occur in the United States; most have been documented since the 1990s. These fish species look similar in the juvenile stages.

These catfish species impact the ecosystem by disrupting aquatic food webs, replacing native fishes, and causing bank erosion. That last impact is why the ACOE is interested in these fish. Suckermouth catfish are large and long-lived with high fecundity. Unlike natives, they also have extreme anoxia and desiccation tolerance. Burrows excavated and occupied by sailfin catfish and their eggs cause siltation, bank collapse, and shoreline instability. Many homeowners along the river are putting in their own fill or riprap. Areas now at risk from suckermouth catfish are the San Antonio River in Texas; lakes,

ponds, and waterways in south Florida; reservoirs in Puerto Rico and Hawaii; and rivers in Mississippi.

The San Antonio River contains the armadillo del rio and three forms of sailfin catfish. Suckermouth catfish were found in 41% of the samples and comprised almost 50% of the fish biomass. Habitats without suckermouth catfish include riffles, scour pools, bendways, and runs. However, they like weir pools, embayments below a runoff structure, eroding vegetative channels, and runs below weirs. Associated species in the San Antonio River are the blue tilapia, redbelly tilapia, and Rio Grande cichlid. These comprise about 70% of the fish biomass.

Sailfin catfish are prevalent in many small water bodies of southern Florida and in Lake Okeechobee. South Florida waters were surveyed by direct observation, seining and gillnetting, and burrow census. Some areas had numerous burrows, although they can be difficult to find. Engineers were especially concerned about the environmental impacts in Florida because of levees set on the banks. Florida has two forms of sailfin catfish: spotted and vermiculated. The taxonomy between the two forms is hard to determine. The team compared 20 morphometric, 8 meristic, and 3 qualitative characteristics. Associated species in Florida are spotted tilapia, brown hoplo, and Mayan cichlid.

A single specimen of suckermouth catfish was collected from the Pearl River in Mississippi in 1992. Yet hundreds are outgrowing home aquaria and subject to release.

Cofrancesco said that they studied the suckermouth catfish's response to high flows. Dispersal ability is being evaluated using swim tunnel trials with field-collected specimens of armadillo del rio. They are able to maintain sustained swimming for over 200 minutes, hold their station at 75 cm/s and swim for 60 minutes, or hold their station at 100 cm/s. Native fish cannot compete at these velocities.

Initial surveys show that sailfin catfish are the prevalent taxonomy in many pet stores. The sailfin is destructive, tough, cryptic, powerful, diverse, and invasive. Management techniques include removal programs, bank stabilization, exploitation, and landscaping. Cofrancesco reiterated that these armored catfish are having a huge impact and need to be addressed.

Habitattitude™ Implementation

Marshall Meyers, PIJAC, gave an update on Habitattitude™, a public awareness campaign with three main objectives:

- Change traditional thinking that it is easier to ban than educate and avoid increased regulations that are virtually impossible to enforce
- Unify government, academia, and industry to address the issue proactively with as little negativism as possible
- Promote environmentally responsible consumer behaviors.

The Habitattitude™ message is a nationally branded social marketing campaign targeting aquarists and water gardeners. The message links environmental messages with beneficial actions and is designed to reach targeted audiences. Meyers thanked the USFWS for funding to procure a national branding company to develop the campaign.

Campaign brand elements include brand marks that provide visual identity, brand names that provide name identity, tag lines that provide clarity and instructions, an embedded web address that directs audiences to primary resources, and additional instructions that provide audiences with actions to take.

The industry is promoting Habitattitude™ through trade and hobby publications, trade and consumer shows, open houses, aquarium societies and clubs, and the Internet. In-kind contributions to the campaign come from pet stores and product labeling. There are numerous industry initiatives to

For easy reference, acronym and species lists are included at the end of this document

promote the campaign, including an upcoming mailing to U.S. households. Meyers displayed several posters, advertisements, and pledge cards developed as part of the campaign. In addition, the first part of the National Geographic's documentary series, *Strange Days on Planet Earth*, focuses on invasive species.

Meyers said that the ANSTF could help by providing active support and promotion of the Habitattitude™ campaign; encouraging the support/participation of other state and federal agencies, as well as conservation and environmental organizations; promoting the campaign to federal and state legislators as an innovative partnership that offers solutions to the complex challenges of invasive species; and stepping the campaign up and down with ANSTF communities.

Principal parties in the campaign include PIJAC, the USFWS, and NOAA's Sea Grant Program. In addition, there are numerous partner organizations from garden centers/nurseries, live plant and animal producers and importers, publications, federal agencies, states, regional panels, and others. He commented that those involved in the campaign are "ready, willing, and able" to present to regional USFWS directors. Principal parties are asking people to sign a user agreement form to keep the message clean and consistent. Camera-ready images are available for affiliates to use, and a database will be accessible soon. If people know of organizations or agencies that the campaign should contact, they should let Meyers know.

May 25 Welcome

Dr. Parker welcomed people for the second day of the meeting and apologized for being unable to attend the previous day. She remarked that she was "queen of celebration" after her testimony before Congress the day before! She thanked Dan Diggs, USFWS, for leading Tuesday's meeting so well and Susan Ellis, CADFG and chair of the WRP, for her help in organizing the ANSTF meeting and the day's presentations. Ellis also thanked speakers in advance. She introduced Tina Proctor, USFWS, who reported on activities of the WRP (see p. 28 for that update).

North American Lake Management Society Partnerships

Robyn Draheim Waldeck, PSU, talked about the North American Lake Management Society (NALMS) partnership. The NALMS annual meeting was held November 2004 in Victoria, BC. This four-day meeting, hosting symposia and workshops, was attended by nearly 550 people, including lake managers, academics, the public, agency personnel, consultants, and vendors.

The WRP and NALMS partnership involved four oral sessions and one poster session on invasive species. PSU's Center for Lakes and Reservoirs staff chaired the sessions, and presenters came from all over North America.

Topics of the aquatic invasive species sessions included egeria, watermilfoil, and hydrilla species; treatment technologies; outreach and education, including the *Clean Boats, Clean Water* campaign from Wisconsin, the lake host program from New Hampshire; the Oregon Invasive Species Council invasive species outreach campaign; and lake management strategies. PSU staffed two booths. One focused on Pacific States Marine Fisheries Commission/Center for Lakes and Reservoirs ANS education and outreach, which included the 100th Meridian Initiative, volunteer zebra mussel monitoring substrates, and New Zealand mudsnail prevention strategies. The second booth was the Aquatic Plant Management Society's ANS management resources.

Educational Materials Catalog

Waldeck also discussed the inventory of AIS education and outreach materials. In 2002, the Oregon Invasive Species Council began discussing activities and projects aimed at informing and educating target audiences about invasive species. In 2003, the council accepted the proposal *Reaching out to Oregon on Invasive Species*. The project had three primary goals: inventory and assess existing education and outreach products on invasive species in Oregon and the Pacific Northwest, develop a generic template for use when developing an education and outreach plan on any invasive species in Oregon, and develop a strategy and implementation plan for education and outreach on AIS.

The first step was to inventory and assess existing activities and materials to determine where gaps occurred in invasive species education and outreach. The inventory was expanded to the entire western region to reduce the need to develop new materials. The beta version of this inventory is available online at www.clr.pdx.edu/AISInventory/.

Education and outreach materials should be inventoried because many brochures, displays, signs, posters, pamphlets, handouts, and videos already exist. Developing an inventory helps avoid duplication of efforts; maximize limited resources; increase the capacity for collaboration; enhance the exchange of readily available information; and increase access to materials and products not readily accessible, archived, or catalogued anywhere else. An inventory will also help identify gaps in messaging and develop new initiatives that will reach target audiences more effectively.

The inventory will be a resource for educators, the public, agencies, academics, and outreach organizations. The database depends on submissions of new materials by the users. Waldeck encouraged those with materials produced by their organizations or materials that they find useful to enter the materials into the database.

The database design was influenced by the Sea Grant nonindigenous species site (www.sgnis.org/), but the scope was altered by geographic region and the focus is now on outreach materials. It is complementary rather than duplicative, and the format allows more powerful searches requiring less bandwidth. Users can also contact publishers or distributors of specific materials.

The database began as a Microsoft® Access database, but PSU hosting required a switch to a SQL Server™ platform. SQL allows a larger, more powerful, and more flexible database than was originally envisioned.

Beta-testing improvements have reduced the cost per unit, added thumbnails to the results page, and added reviews and user comments. A new effort is needed to recruit current and future materials as well as to publicize the database's existence. ANSTF members suggested that Waldeck seek help from the Lake Society and noted the nationwide need for such a database.

Facilitating US/Mexico Cooperation

Susan Ellis, chair of the WRP, spoke concerning collaboration between the WRP and Mexico. There is a need to work with Mexican scientists on a variety of issues.

The WRP provided some matching funds to the California Sea Grant in San Diego to extend its coastal hull-fouling research and outreach into Ensenada. Leigh Johnson, University of California–Davis, is developing a new, multiple-year project to prevent the hull transport of aquatic invasive species to and among coastal waters of the western regions. Johnson is applying the lessons she learned about technologies and multiple stakeholder collaborations during her project on preventing pollution from copper boat-bottom paints (<http://seagrant.ucdavis.edu>). Johnson is also applying for major funding from the National Sea Grant College Program and additional funding from the California Department of Boating and Waterways to address the hull transport issue. She has

identified participants from Mexico, has developed contacts, and is going to develop printed materials for translation.

Ellis spoke on behalf of John Chapman, Oregon State University, who is working on a new collaboration with the Desert Fishes Council. The first meeting will be in November, with a report given later. The mission of this nonprofit group, established in 1969, is to preserve the biological integrity of desert aquatic ecosystems and their associated life forms, to hold symposia to report related research and management endeavors, and to effect rapid dissemination of information concerning activities of the Council and its members. The Council, which first included Mexico in 1980, meets yearly, alternating between the United States and Mexico, and maintains a bilingual website.

Invasive species, particularly fish, have concerned the Council for years. The schedule for the next meeting (November 17–21) includes a half-day of talks dedicated to invasive species, a field trip, and a one-day workshop. The goal is to see where there are common interests in freshwater ecosystems. Panel money has been used to help Mexican scientists attend the meeting. Although the Council has worked primarily with three university people, it would like to involve grassroots communities.

Ellis said that we all recognize that, in a huge biogeographical region, there can be long periods of latency between establishment and severe impacts to the ecosystems and that invasive species can destroy things we don't even know about. The United States should be a partner in solving issues specific to Mexico since those species can move north at any time and we have greater financial resources. She added that an *Arundo donax* symposium will be held on June 4, 2005, in Cuatro Ciénegas, Mexico.

Facilitating United States–Canada Cooperation

Spartina Eradication Project

Kevin Anderson, Puget Sound Action Team (PSAT), reported on work that Pat Lim, DFO, and others did to control *Spartina* in Boundary Bay, British Columbia. Boundary Bay is adjacent to the U.S.–Canada border and shares marine waters with Washington state. In 2004, the WRP gave the team seed money to stop the spread of *Spartina* from Boundary Bay into Washington.

S. anglica is a problem because it is a nonnative that invades rapidly and aggressively. It disrupts the ecosystem and critical habitat. In Washington, it is considered a noxious weed. Boundary Bay is especially significant because it is an internationally important bird area on the Pacific Flyway.

Spartina eradication is a cross-border issue because of its potential to reinvade. No *Spartina* is found in Whatcom County, WA, and the state has been controlling *Spartina* since 1998. In 2003, the state treated 690 of 770 solid acres. Since 1998, the State of Washington has invested about \$500,000 per year to control this invasive plant in the Puget Sound basin.

The DFO recruited 90 volunteers from 15 organizations to help control the *Spartina* infestation. Because the Fraser River estuary is such an important area for fish and birds, Canadian and provincial environmental agencies do not permit the use of herbicides within intertidal areas. Volunteers hand dug patches of *Spartina* smaller than one square meter. The province provided an amphibious excavator to dig out and bury larger patches.

Kyle Murphy, the Washington State *Spartina* Coordinator, and Laurel Shiner from the Whatcom County Noxious Weed Control Board provided technical support, surveys, and volunteers at dig. Lim coordinated the project, recruited volunteers, and hosted the three-day dig.

The project leverages considerable interagency cooperation and equipment. Seed money provided by WRP also leveraged between \$18,000 to \$25,000 in volunteer hours and equipment costs. In addition, the province of British Columbia provided \$30,000 to rent an excavator.

During the three-day dig, volunteers dug 8 tons of *Spartina* that were incinerated at the Greater Vancouver waste-to-energy facility, and 40 tons were buried on site by the excavator. Future steps include monitoring, retreating, and controlling new infestations. In June 2005, representatives from British Columbia will revisit the area to gauge success.

Partners and cooperators include the WRP; DFO; PSAT; Canadian Wildlife Service; Ducks Unlimited Canada; Vancouver Port Authority; GL Williams and Associates; Delta Air Park; Northwest Wildlife; Whatcom Noxious Weed Control Board; The Nature Trust; Corporation of Delta; Ministry of Water, Lands, and Air Protection; Vancouver Aquarium; and University of British Columbia.

Border Crossing Materials Project

Anderson also talked about a recommended protocol to deliver consistent ANS messages to travelers who trailer boats across the United States–Canada border. Pat Lim, DFO, hired a student from the University of British Columbia to help with this project. The project scope was to identify agency requirements and protocols, identify existing messages and mechanisms, and recommend a process for delivering consistent messages.

In 2004, 5.1 million cars (excluding commercial vehicles) crossed from Canada to Washington, Idaho, and Montana. If even 1% of those cars had a boat on a trailer, 51,000 boats would have entered the United States that year, and an equal number would probably cross into Canada from these states.

The project staff interviewed border officials in British Columbia, Alberta, Saskatchewan, and Manitoba to identify agency requirements and protocols. Staff also interviewed contacts at the Great Lakes and Northeast panels. They were asked about procedures used for looking at boats on trailers and identifying ANS.

Preliminary results on the United States side indicate that states have several mechanisms and a variety of messages available to educate and inform boaters. The United States has developed a very clear message: Stop Aquatic Hitchhikers! Canada does not have a similar message. Neither the United States nor Canadian border protection agencies train officials on ANS threats, nor do they provide decontamination facilities if ANS are found.

The WRP recommended that the ANSTF ask the U.S. Customs and Border Protection Service to participate in the Stop Aquatic Hitchhikers! campaign and ask Canadian agencies to sign up as campaign partners or develop a similar message and program for Canada.

The United States and Canadian border services should also consider training for border officials on ANS issues; providing boat inspection stations; and providing ANS messages on websites, promoted through radio stations and included on brochures in NEXUS renewals. NEXUS is a program that allows low-risk vehicles to travel across the border without being inspected.

Following the presentation, ANSTF members suggested that training might be more effective if the types of ANS moving across the border were actually known. Washington has an inspection program that might be able to provide this information. The ANSTF will seek the Department of Homeland Security's participation through USFWS and APHIS efforts.

Pacific Coast Estuarine Information System

Henry Lee, USEPA, talked about the Pacific Coast Estuarine Information System (PCEIS), a geospatial database of the native and nonindigenous estuarine species of Oregon, Washington, and

California and landscape characteristics of the estuaries and watersheds. This database is a joint USEPA and USGS project with the Washington Department of Energy, CADFG, and Oregon Department of Parks and Recreation. The WRP provided the initial funding in 2003, and the USGS and USEPA provide continued funding. The alpha version of the database is undergoing extensive revisions and quality assurance. A beta version will be available in 2005. The database will be published and distributed on CD rather than hosted on the Internet.

Although a number of databases are available, he views this database as an ecological risk assessment tool. The database includes native and nonindigenous estuarine fishes, invertebrates, and plants and contains quantitative estimates of the regional distribution of species and links to density estimates. Ultimately, it will include watershed and landscape information for all estuaries of the three Pacific Coast states since invasions occur at a landscape level. Users will be able to output data and references for analysis. The database currently includes over 5,400 taxa, 1,013 NIS and cryptogenic species, 182 estuaries, and over 550 subestuaries or tributaries. He doesn't believe that the list of 1,013 species reflects synonyms, NIS that have been introduced but haven't yet established, questionable identifications, or disagreements on species classification.

Then Debbie Reusser, USGS, demonstrated the existing version from a CD. A menu allows the user to choose different ways of searching for data: state, county, estuary, or tributary. She chose Elkhorn Slough because of its proximity and showed a form that includes species listed for that area. Then a user could sort by species or other categories. A taxonomist is working with them to classify species. The database can output information to Microsoft® Excel spreadsheets. In addition, the database includes printable versions of reference information. A user can find physical information about a watershed such as a photograph of Elkhorn Slough, its latitude and longitude, and links to the web.

Lee showed a sample matrix classifying each of the 1,000+ species by authority. An additional benefit of the database is the user's ability to ask questions such as the number of estuaries for which an NIS has been reported.

The database has the potential to be an effective management tool. It can provide baselines for early detection/rapid response and for performance measures for BW management. For regional ecological assessments, it can help identify native species at risk, including "rare" species, and derive measures of ecological condition at estuary or regional scales (taxonomic distinctness). It might also be used to predict likely invaders in one region based on invasions in another. For outreach, it can serve as a communication tool for decision makers, NGOs, watershed councils, and others.

California Ballast Water Program

Ellis commented that California does not have a state management plan for ANS because of the complexity of the state government. However, she believes that ongoing efforts are good. Then she introduced Maurya Falkner, CSLC, who talked about the California Ballast Water Program.

During the 2003 California legislative session, the Marine Invasive Species Act was passed and signed by the governor. The purpose of this act was "to move the state expeditiously toward the elimination of the discharge of nonindigenous species into the waters of the state or into waters that may impact the waters of the state, based on the best available technology economically achievable." Under the act, the Board of Equalization (BOE) is to collect fees, the CADFG is to resurvey sites and expand the surveys to open coastal regions to create a baseline of species found in the state and determine whether BW measures were effective, the State Water Resources Control Board is to consult on technology and performance standards issues, and the CSLC is to implement the program and conduct research and inspections. The BOE has been impressed with the 97% compliance with submitting the fee.

The key provisions of the act include a sunset date of January 2010 to ensure that legislators revisit the issue, a "polluter pays" fee, a safety exemption, reporting and record keeping that has been expanded

to include coastal traffic, continued biological surveys, and ecological studies. In addition, a technical advisory group, comprised of representatives from the maritime industry, environmental organizations, regulatory agencies and other stakeholders, has been formed to coordinate activities. The act applies to all vessels greater than 300 gross registered tons operating in California waters, and the only exemption is for safety (other exemptions were removed).

Falkner then displayed graphs of 2004 data (qualifying voyages arriving at ports, vessel calls by type, and last ports of call). In 2004, the majority of vessel calls arrived at the Los Angeles–Long Beach complex. The second most popular area was Oakland. As expected, container vessels coming from Asian ports, other California ports, or Mexican ports made the majority of vessel calls. Over 90% of all vessels reported to be complying with the state law. Eight percent reported noncompliance with BW management activities. Of those, the majority (nearly 73%) were from Mexican waters, followed by vessels originating from Central America. About a third of BW discharged into southern California waters comes from another southern California port.

Additional requirements of the act include expansion of the program to include coastal traffic, with regulations issued by January 1, 2005, and vessel compliance by July 1, 2005; development of an experimental technology advanced approval program, with regulations due July 1, 2005; recommendation of potential performance standards, with a report due January 31, 2006; and evaluation of other possible ship-mediated vectors, with a report due March 1, 2006.

Several meetings were held to address the management of BW originating from coastal areas between Alaska and Baja California. In March 2002, a meeting of regional oceanographers was held, where the following issues were discussed:

- BW discharges within 50 NM of the retention zones and 15 NM of tidally influenced estuaries should be avoided.
- BW discharges outside the 1,000-m isobath have a lower risk.
- Seasonality should be considered.

In January 2003, a meeting of key stakeholders that included members of the regulated community; regulators; and representatives from local, state, federal, and international groups was held. Participants discussed the significant threat of introducing ANS through BW, compilation of available data, creation of a uniform regional program, safety exemption, costs, inadvisability of exchanges in waters less than 200-m deep, and enforcement of regulations. These meeting participants requested all available data on shipping patterns and costs. Some data received from the industry allowed the CSLC to assess the potential impacts of requiring vessels to move farther offshore to conduct a BW exchange.

A second meeting resulted in the preparation of draft regulations. Following a meeting with the technical advisory group in December 2004, a rulemaking package was submitted. The regulations were published April 15, 2005, and the public comment period closed June 8. The regulations are expected to go into effect in early 2006. Although the safety exemption remained, abuse of the exemption will not be tolerated. Vessels need to find a way to comply with the law and can use one of several management options, such as retaining BW, achieving a greater than 95% exchange of BW farther than 50 NM from shore in water that is deeper than 200 m, using approved alternative technology or approved shore-based treatment systems, or applying to the CSLC for an alternative.

Research projects include a two-year BW exchange verification project being conducted with SERC, a two-year shipboard treatment technology project being conducted with Matson Navigation, and a two-year hull-fouling research project being conducted with the Aquatic Bioinvasion Research and Policy Institute (PSU and SERC).

In the future, CSLC hopes to improve compliance by updating the database to improve compliance reporting. As she previously mentioned, the industry is willing to comply, and the response had been good from shipowners and operators. CSLC has also worked with an advisory council to develop recommendations for BW treatment performance standards.

Falkner encouraged anyone wanting additional information to contact her (916-574-2568 or falknem@slc.ca.gov). The 2005 biannual report is available at www.slc.ca.gov.

Following the presentation, the following issues were discussed:

- Washington currently has a 50-mile, no-depth rule, while Oregon has passed a resolution to follow the laws adopted by Washington and California. British Columbia has adopted an IMO resolution as an intermediate step, and Alaska has no program. The CSLC has had no success communicating with Mexico.
- The program is successful because of an active field inspection program, local contact with all levels of the maritime industry, intensive and extensive outreach and education, enforcement authority, and civil and criminal penalty provisions. The Marine Invasive Species Program can spend a great deal of time “doing our jobs” because we have a secure funding source.

Undaria at Monterey Bay National Marine Sanctuary

Before taking people to the Monterey Bay National Marine Sanctuary (MBNMS) to see *Undaria pinnatifida* specimens, Dr. Steve Lonhart, NOAA, spoke about the sanctuary program. Currently, 13 sanctuary programs exist in the United States, and another is proposed for Hawaii. The MBNMS itself consists of 5,322 square statute miles, with a shoreline of 276 statute miles. Habitats include estuaries, beaches, rocky shores, kelp, the shelf, canyons, deep sea, open ocean, and cold seeps. The biological diversity is immense with 33 mammals, 345 fishes, 94 birds, 4 turtles, 31 invertebrate phyla, and 450 algae species.

Three of the existing 13 sanctuaries—Monterey Bay, Gulf of the Farallones, and Cordell Bank—are contiguous. These three sanctuaries are currently undergoing a joint management plan review, which contains over 25 action plans, including coastal development, ecosystem protection, partnerships and opportunities, water quality, and wildlife disturbance.

A key component of the ecosystem protection action plan is the introduced species action plan. The goal of this action plan is to maintain the natural biological communities and ecological processes in the MBNMS, protecting them from the potentially adverse impacts of introduced species by 1) preventing new introduced species from becoming established and 2) detecting, controlling, and where feasible, eradicating environmentally harmful species that are introduced to MBNMS waters.

Most scientific research and funding are focused on prevention. But for those invasive species that do arrive, the goal is to control or eradicate. The introduced species action plan includes five strategies: pathways of introduction, an introduction prevention program, baseline information and a research/monitoring program, a detection and response plan, and resource assessment. It was educational for Lonhart to realize, through his attendance at this meeting, how many resources are available for the sanctuary. Aside from the action plan that will guide management for the next five to ten years, there's another tool that MBNMS management will use—regulation.

Proposed regulations prohibit release within or adjacent to the MBNMS (within 25 miles offshore) of nonnative species or their propagules, genetically modified organisms, and BW. Levels of enforcement include verbal warnings from a NOAA officer, educational letters, warning letters, tickets, and fines. The regulations are being taken very seriously since most people don't want another layer of regulation but understand the need in this case.

Project collaborators include the Monterey Harbor Master's Office, City of Monterey volunteer services, CADFG, and Moss Landing Marine Laboratories. Initially, the *Undaria* project was unfunded, relying on volunteers and their equipment and enthusiasm, but some grant funding has recently been acquired.

Lonhart gave some background on *U. pinnatifida* or wakame, an aquatic plant native to the Sea of Japan. Due to its reproductive capacity and ability to spread worldwide, it had been included on a list of the 100 worst invaders. *Undaria* is distinctive from native algal species. In native ranges, *Undaria* dies off during the summer, but the local invasions showed year-round persistence because of overlapping generations.

Lonhart displayed a map of *Undaria*'s spread in California. It was first observed in Los Angeles harbors in March 2000 and had spread to Monterey Harbor by August 2001. An invaded area on Santa Catalina Island has no harbor, but there is frequent traffic between there and the Los Angeles–Long Beach area. Unlike *Caulerpa*, this species doesn't reproduce asexually. Rather, it has a heteromorphic life cycle. Only the large sporophyte phase can be seen, although microscopic sites are probably transported to new locations.

In the *Undaria* project, volunteers scuba dive or rake to remove the plants. Then they record length, damage, and reproductive status. Lonhart showed close-up photographs of the plant's distinguishing characteristics.

Lonhart then gave an overview of the harbor. He displayed maps of the floating docks, with black dots showing where divers had sampled for the presence or absence of *Undaria*. Proliferation could be seen within a year. Removal was started in 2003, and in 2004, patterns were similar. In 2005, they could see a difference in coverage and density, not just in Monterey Harbor but elsewhere as well. Removal appears to be having an impact, but something else is also happening; he's not sure what, but it is likely some response to environmental conditions.

So far, they have learned that this effort is about management, not eradication. Even if all the *Undaria* were removed, there is no mechanism for preventing further inoculation. *Undaria* continues to spread slowly but is not found in heavily shaded structures. Up until late 2004, it was found only on artificial structures, but it then recruited to "natural" substrates. A concern is that it might escape to the open coast. Potential effects are displacement, altered structure, and altered function of algal beds. *Undaria* may serve as a new resource to native organisms and have possible commercial uses. Samples were sent to Japan and tested for consumption by humans since there is interest in harvesting *Undaria* and exporting it to Japan. Fishes have also been found using the three-dimensional structure as a refuge from predators. Some of these fish species are being identified to ensure that they aren't also nonnatives.

He encouraged people to visit the sanctuary website at www.mbnms-simon.org. Following his presentation, Lonhart guided people to the industrial wharf in the marina. Volunteers work through all the boat slips (over 400) and pilings for about two days every two months. They strive to pull plants before they are reproductive. Graduate students look at the viability of spores, since not all become gametophytes. Although most of the slips had recently been cleaned of *Undaria*, Lonhart had asked volunteers to leave a little for his demonstration. He raked a few specimens up and laid them out on the dock to show people. When they bring up the seaweed, they have to carefully remove any of the kelp fish and crabs. He said that they're also looking at whether the plant reattaches or continues to grow after it's detached. If not, volunteers could scrap the plants off without having to collect them, which would greatly increase diver efficiency and their ability to cover larger areas during shorter dives.

Invasive *Spartina* Project

Peggy Olofson, project director, reported on the Invasive *Spartina* Project (ISP) in the San Francisco Estuary. The California State Coast Conservancy established the ISP in 2000 to address the rapid spread of four introduced and highly invasive *Spartina* (cordgrass) species: *S. alterniflora*, *S. anglica*, *S. densiflora*, and *S. patens*. It focuses on these nonnative *Spartina* species and hybrids with the native *Spartina* (*S. foliosa*). Other species of *Spartina* are not nearly as much of a problem as the robust and aggressive *S. alterniflora* and its hybrids.

Funding for the ISP comes from the CALFED Bay-Delta Program, California Wildlife Conservation Board, USFWS Coastal Program, National Fish and Wildlife Foundation, and California State Coastal Conservancy, although the project includes partnerships with many more entities, from small local governments and landowners to state and federal agencies.

The ISP is comprised of a number of components including outreach, research, permitting, mapping, monitoring, and the allocation of funds for efforts to eliminate populations of nonindigenous *Spartina*. After many iterations, a programmatic environmental impact report was finally completed in September 2003.

The project provides funding to partners who take the lead at various sites so that they can implement actions and coordinates most of the permitting and environmental compliance issues. National Pollutant Discharge Elimination System (NPDES) permits are required for any sites at which herbicides will be used.

This year, ISP partners plan to treat more than 800 acres of nonnative *Spartina* at 122 locations, up from last year's pilot treatment of 435 acres at 24 locations. The ISP has developed individual control plans for each of the treatment areas. This year, they have 22 control plans, each with a detail scope of work and environmental assessment. Each plan includes a six- to eight-page impact mitigation matrix for any impacts that could occur, signed off by the appropriate people. The control plans include protocols for different control strategies.

Various treatment methods are used, from herbicides applied via helicopter in extremely sensitive habitats to manual tarping, digging, and mowing in less sensitive habitats. Olofson commented that mowing tends to "make the plants mad," causing them to grow back more vigorously the next year, but it removes the seeds for one year. Treatments occur during low tide from September through mid-October, so the season is short (45 to 60 days). The USFWS has helped expand the control window by allowing some herbicide treatment by helicopter as early as July. However, the best herbicide to date, glyphosate, doesn't work well with aerial application, a factor that makes control all the more difficult. She commented that a new herbicide, imazapyr, might be added. The Department of Pesticide Regulation is scheduled to register the chemical by midsummer 2005. [Aquatic imazapyr, as brand name Habitat, was registered by the state on August 30.] Then the State Water Resources Control Board has to add it to the other herbicides approved for the project.

Olofson then provided an overview of the ISP's 2000–2004 monitoring program findings. Through baywide inventory monitoring in 2000–2001, the ISP confirmed that the North Bay had not yet been invaded by nonnative *Spartina* and was still entirely native *S. foliosa*. During 2003, the ISP monitored a subset of sites baywide, confirming that the North Bay was still free of nonnative *Spartina* and showing that there had been an average 317% increase nonnative *Spartina* over three years in the South and Central Bay.

Some of the constraints and challenges facing the ISP include contractor coordination, amount of California clapper rail take negotiated with the USFWS, public concern about seeing dead *Spartina* and herbicide use, potential establishment of *Spartina* in new habitat, and means for defining success of control measures. Olofson commented on the numerous expressions of the hybrids, some of which

look very similar to the native *Spartina* species. Although hybrids can be confirmed by laboratory analysis, at times the ISP must look for “bad actors” or behaviors uncharacteristic of the native.

For 2005, permitting procedures are going well. They have found four invasion locations that may significantly affect clapper rail habitat, so project staff are working with the USFWS to develop treatment strategies and mitigations (including replanting with other native plants) to reduce the impacts on clapper rails. In addition, the final evaluation of the new herbicide should be completed in 2005. In the long term, the ISP plans to work with University of California–Davis to develop invasive marker profiles and conduct random sampling to better understand the invasives. Eventually, control measures will be turned over to partner groups to continue.

The following issues were discussed after Olofson’s presentation:

- Although the ISP tries to minimize collateral damage to native *Spartina* during control, sometimes native plants are killed. Above all, they are working to keep the hybrid out of the North Bay since hybridization is a bigger concern than killing natives. Starting a nursery of native *Spartina* has been suggested.
- Invasive *S. alterniflora* is a “landscape engineer,” creating land where there was marsh. In some places, hybrids have changed the mudflats, and it’s not known whether the land will return to mudflats once the invasive *Spartina* is killed. In Washington, huge areas of *S. alterniflora* have been successfully treated, and people are waiting to see whether the mudflats return. Olofson suspects that in some areas, we’ll “end up with a new high marsh that we’ll have to learn to love.”
- Project costs so far total about \$4 million. A large portion of that went into the environmental impact report. Compliance has required another large portion. This year, treatment will cost about \$600,000. Olofson commented that the ISP is keeping good documentation that may be useful for other efforts.

Field Trip to National Estuarine Research Preserve at Elkhorn Slough

After the May 25 ANSTF meeting, a group attended the “Elkhorn Slough Safari,” a guided boat tour of the slough. Participants were asked not to yell at or otherwise harass the marine mammals and other wildlife, which have special protective status. Individual group members were assigned the task of counting particular animal species observed by the group on the safari. Such wildlife included harbor seals, sea otters, sea lions, brown pelicans, seagulls, forrester terns, Brant’s cormorant, western grebe, and other bird species. The sea otters are a great success story for endangered species recovery since all the California coastal sea otters are descendant from a remnant population of 32 individuals found in Big Sur and protected over the years.

Lamentably, Elkhorn Slough used to be home to the largest population of tule elk. Small remnant populations still exist in California but nowhere near historic levels. Elkhorn Slough is thought to take its name from this historic resident species.

Many terrestrial invasive species of plant, on the shores of the slough, were visible from the boat, including eucalyptus, ice plant, fennel, poison hemlock and others.

The tour did not include viewing of introduced invasive aquatic species since it was conducted at high tide and most of the introduced species live in the soft bottom sediments (mud). To view most of the introduced species would have required a field trip with waders and nets. Nonnative species are estimated to encompass 60% of the invertebrate population in the slough. For example, an estimated one billion Japanese mudsnails inhabit the slough. Introduced tube worm populations are so high that they are estimated to filter all of the water in Elkhorn Slough every three days.

To address the threat of nonnative species introductions, the National Marine Reserve System has created programs that integrate research and education with adaptive management programs. Elkhorn Slough has been continually monitored over the prior two years for environmental conditions and new introductions.

The “least wanted aquatic invaders” program has been a successful for providing outreach and monitoring invasive species entering the slough. A summary of this program can be found at www.elkhornslough.org/research/aquaticinvaders.pdf.

May 26 Welcome

Dr. Parker welcomed people to the third day of the meeting. She was impressed with presentations given the day before and believed that there was definitely a role that the ANSTF could play in working with international partners. This forum also provides people the opportunity to hear each others accomplishments and needs so that they can draw on each other as resources. She praised the field trip to Elkhorn Slough and commented on the wonders of nature and the responsibility that we all have to protect such areas.

Before presentations started, Parker informed participants of the aggressive agenda. The agenda item to discuss funding ANSTF priority activities was moved to the fall meeting to accommodate those having early flights. She reiterated that those guests wanting to make public comment needed to sign up at the registration table by the morning break.

IMO and Coast Guard ANS Program

Commander Kathy Moore, Chief of the Environmental Standards Division for the USCG, gave an update on Coast Guard activities. Regarding the international arena, the Ballast Water Working Group met during the IMO Bulk Liquids and Gases Subcommittee’s 9th session (BLG 9) on April 4–8 in London and made considerable progress in finalizing text of guidelines supporting last year’s Ballast Water Management Convention. Guidelines on BW management plans, exchange, and equivalent compliance will be forwarded to the 53rd session of the Marine Environment Protection Committee (MEPC 53) of the IMO for adoption by an MEPC resolution. Draft guidelines on sediment reception facilities and BW reception facilities were recommended for forwarding to the Flag State Implementation Subcommittee for comment. And draft guidelines on design and construction to facilitate sediment control on ships were recommended for forwarding to the Subcommittee on Ship Design and Equipment.

The Intersessional Ballast Water Work Group will be meeting again in July to continue developing text for guidelines to address design and construction for BWE, sampling for compliance, risk assessment, additional measures, prototype systems, and possibly designation of alternate BWE zones.

MEPC 53 will be held July 18–22 to adopt guidelines forwarded by the BLG 9. Among the guidelines are procedures for approval of active substances, which are any substances that have a direct effect on organisms in BW. Under the Convention, these substances must be approved by the IMO. The relationship with EU procedures is a large part of the discussion at this point. Participants to MEPC 53 will also review the availability of BW management technology in light of the Convention, implementation dates, and vessels affected by these implementation dates. Several nations will submit documents discussing multiple technologies (including the United States, Germany, Norway, and Australia).

In the domestic arena, BW regulatory projects include the publishing of two rules in the Federal Register, penalties (implemented August 13, 2004) and mandatory BWM (implemented September 27, 2004). The notice of intent to publish the environmental impact statement for a third rule, BW

For easy reference, acronym and species lists are included at the end of this document

discharge standards, was published September 26, 2003. The national mandatory BWM program is consistent with the mandatory Great Lakes regime. All vessels inbound from outside the Exclusive Economic Zone must exchange their BW, retain their BW, or treat BW with some approved system. If they choose to exchange their BW, they must do so in the open ocean (at least 200 NM from any land [no depth restriction]). The safety exemption remains.

Compliance efforts are aided by an educated and generally willing industry. Probably the most common discrepancy is that vessels have plans but they are generic rather than vessel-specific. In addition, it is not an easy process to record information on the required forms. The Ballast Exchange Assurance Meter or BEAM screening tool (a hand-held device capable of testing BW by looking for colored, dissolved organic matter fluorescence, which indicates coastal water) will be a boon for compliance. She explained how the device works. Right now, training is being provided, and the validation testing on the device is nearing completion.

The Shipboard Technology Evaluation Program (STEP) aims to analyze the performance of treatment systems on board ships (developed to offer better protection of the environment than BW exchange). Currently, there are two active applicants, with several others planned. The application is being revised to offer more guidance for submitting.

The Naval Research Lab's (NRL) Key West, FL, facility for evaluating the performance of BW treatment technologies is preparing for validation tests around August 2005. The treatment system test design is still evolving, and a group is identifying characteristics and surrogates for challenge water. The surrogate organisms have to withstand some abuse. There will also be a pilot test of ETV protocols. The NRL has been evaluating the draft protocols and adapting the existing facility in Key West. Now it needs to identify candidates willing to participate and conduct the pilot test. Moore showed a photograph of the facility and a diagram of the various specialists making up the evaluation team. The synergy created by the diversity of participants has helped the team with technical innovations such as devising an approach for injecting an organism into a flowing stream so that it can survive for later recapture.

Moore next talked about NOBOBs in the Great Lakes. The USCG published a final rule on June 14, 2004, that expanded the BW reporting requirement to all vessels equipped with ballast tanks, thereby including NOBOBs. Seven of the eight state attorneys general for the Great Lakes states filed a petition for the USCG to develop regulations for NOBOBs. During the comment period, 25 comments were submitted, and several more were received at the public meeting held May 9, 2005, in Cleveland, OH. Moore described some of the challenges with developing management strategies for NOBOBs. Some ships visit the Great Lakes so infrequently that adding equipment is not a feasible option for treating BW. Also, the ballast parts of some journeys, especially those from some northern European ports, are so short that exchange isn't always an option. There are also safety and naval architectural issues. Because NANPCA does not exclude the Clean Water Act, treated BW discharges are subject to state water quality requirements for residuals, byproducts, and water chemistry parameters. Some treatments use chemicals or produce residuals or byproducts. Therefore, regulation of BW treatment is shared by multiple agencies.

BWM technology development for both the international and domestic arenas includes chemical and nonchemical biocides. Chemical biocides are the most often discussed and include chlorine dioxide, hypochlorite, and ozone. Nonchemical biocides include ultraviolet light, filtration, deoxygenation, and physical disruption ("organism torture").

Moore summarized several positive trends in BWM system development. These trends include greater corporate investment, greater flow-rate capabilities, investigation of process control, packaging and materials, safety and fail-safe features, and shipowner participation. Prior to the 2004 Convention,

many efforts were private and inadequately funded. Since adoption of the Convention, the situation has improved.

However, there are still areas that need to be addressed. Considerable testing is done behind “closed corporate doors” because companies want to protect proprietary information. STEP and the ETV program are ways for third-party validation of treatment systems. Regarding biocides, the regulatory constraints need to be understood, as do impacts of disinfection byproducts. Waste stream management is also an important issue needing to be discussed.

At the end of her presentation, Moore reiterated that the future of the USCG ANS program includes domestic rulemakings, an international convention, research and development to support enforcement and evaluate treatment systems, and coordination with other stakeholders to develop and implement ANS prevention and control strategies.

Maurya Falkner, CSLC, asked about the cost and availability of the BEAM device to other regulatory folks. Moore wasn't sure about the cost but suspected that, once validation data were available, others could purchase the device. She hoped that ships would purchase the device as well. Falkner volunteered testing help from her inspectors.

Dean Wilkinson, NISC, praised Moore for doing an “unbelievably good job of keeping us on track” with 14 sets of different guidelines.

Ecological Surveys

Sacramento–San Joaquin Rivers Delta Phases 1 and 2

Jeff Herod, USFWS–CNO, spoke about phases 1 and 2 of the ecological surveys of California. David Bergendorf is the ANS program assistant for this project, and Lia McLaughlin is the NIS watershed coordinator. According to NISA, ecological surveys “examine the attributes and patterns of invasions of aquatic nuisance species; and provide an estimate of the effectiveness of ballast water management. . . .” The purpose of these surveys includes assessing where aquatic ecosystems are the most vulnerable to invasion; determining risk factors that make particular systems more likely to be invaded; inferring the relative contributions of different vectors to new NIS introductions including shipping, aquaculture releases, aquarium dumping, bait releases, live seafood trade, recreational water users, and hydrological dispersal within the systems; establishing and enhancing baseline information on the patterns and diversity of freshwater and marine biota in North America; and estimating the rate of species introductions over time.

Phase 1 consisted of a literature review and creation of a database intended to serve as a baseline for future assessments and to provide guidance for directed on-the-ground surveys. Phase 1 led to the development of recommendations for targeted surveys, which moved them into phase 2. Phase 2 consisted of a survey of the San Diego Harbor and Sacramento–San Joaquin Delta.

The literature review identified 193 definite or probable NIS and 25 cryptogenic species. The three main taxonomic groups were vertebrates, plants, and invertebrates. Invertebrates included arthropods, annelids, mollusks, and others, such as flatworm and nematode parasites. Invasion sources differed between taxonomic groups, with vertebrates largely from North America, plants from all continents but predominantly Europe, and invertebrates usually from Asia or North America. Invasion vectors included shipping, research, individual release, fisheries, biocontrol, and agriculture. Shipping is becoming a larger component in the estuary, but freshwater introductions began through stocking for recreation.

Phase 1 also culminated in the formation of an NIS database that includes species-specific information on taxonomy, invasion history, ecology and habitats, distribution within the estuary, and citation

information. The goal was to make the database simple. Four recommendations were proposed following Phase 1:

- More thorough sampling, preferably annually but at least every two to three years, of several habitats and groups that are undersampled by current efforts.
- Increased sampling of shallow-water habitats, including small channels and sloughs, the margins of larger channels, temporary pools, vegetation, and fouling communities.
- Improved taxonomic work, particularly for species-level identification of larval insects, phytoplankton, and periphyton.
- Increased attention to other vectors, including aquarium and bait releases, recreational boating and fishing, and garden and ornamental pond escapes.

Phase 2 was coordinated with CADFG survey sites and began with the San Diego harbor. The survey focused on areas and habitat types not surveyed in routine monitoring by others. Herod displayed a map of the area being surveyed.

The team met in the spring to discuss study design, taxonomic focus, and sites to be sampled. Twenty-one appropriate sampling locations were identified, and approximately two-thirds of those were evaluated for suitability in March 2005. The evaluation of remaining sites was delayed until the team received access approval to restricted military locations. Sampling began April 25, 2005. Remaining sites are scheduled to be sampled during May and June.

San Diego Harbor sites were selected in marinas, deep-water areas, and mooring areas. The San Joaquin Delta has some unique challenges for sampling. It is a 1,100-square mile confluence that contains some brackish water.

Through these surveys, California is advancing its scientific understanding by developing species inventories, sampling methodologies, and decision support tools for addressing the ongoing threat of ANS.

Following the presentation, participants asked what types of plants were included in the surveys and whether results were being coordinated with Henry Lee's database. Herod responded that surveys targeted macrophytes only, no algae. And all data were going to the Smithsonian Institute, which works closely with Lee. Herod was also asked how the team determined the vectors. He answered that the term "probable vector" was more accurate. For the most part, these probable vectors came up during the literature review. The report is finished and will be posted soon for those interested.

2004 Lower Columbia River ANS Survey Report and Update on New Mid-Columbia/Lower Snake River Survey

Paul Heimowitz, AIS Coordinator for the USFWS Pacific Region, presented information on two studies—an ANS survey of the lower Columbia River (LCRANS) and another on the mid-Columbia and lower Snake rivers. Heimowitz was presenting this information on behalf of the principal investigators: Robyn Draheim Waldeck, PSU; Mark Sytsma, PSU; Jeff Cordell, US; and John Chapman, OSU. These projects have both been coordinated by the Pacific States Marine Fisheries Commission.

The lower Columbia River survey was specifically identified in the 1996 NISA, which stated, "...The Secretary, in cooperation with the Task Force and academic institutions in each of the States affected, shall conduct an ecological and BW discharge survey of the Columbia Rivers system..." The study focused on the lower Columbia River up to Bonneville Dam, where five major deep-water ports are located: Astoria, Longview, Kalama, Vancouver, and Portland. It was funded by the USCG and USFWS.

Project objectives included characterizing nonnative species in the lower Columbia River to provide a baseline for 1) calculating the rates and types of species introductions to the river, 2) evaluating the efficacy of BW regulations, and 3) contributing new information to ongoing regional ANS studies. To implement the project, a literature review was conducted, a technical advisory committee formed (including the shipping industry), field surveys conducted based on the gaps identified, and a final report prepared. This report was completed October 2004 and is available at www.clr.pdx.edu/projects/cr_survey. The thorough literature review focused on prior surveys conducted by fisheries management and the hydroelectric industry. Nonnative fishes and plants were well documented: 27% of fishes were nonnative and 15% of aquatic plants were nonnative. Many of the nonnative fish were intentionally introduced by agencies, so they were well documented. However, while the Asian clam appeared to have been introduced to the United States via the Columbia River, its introduction exemplifies those that were poorly documented. The impacts of ANS have also been poorly documented.

Overall, 81 species of fish species, arthropods, vascular plants, and other species were identified as having been introduced since the early 1800s. Many more were identified as cryptogenic. Species accumulation over time showed an increasing rate of introduction. By far, most nonnatives came from other parts of North America. Those introduced intentionally were often from the eastern United States and introduced through recreation or commercial purposes. Most unintentional introductions came from Asia. Probable invasion mechanisms were based on the timing of the invasions, and BW seemed to have contributed a significant portion, followed by fishery enhancement and release by individuals. Many species were present in other estuaries along the west coast.

Work done in the 1990s showed a major shift in the zooplankton community, especially in the mouth of the Columbia River. In the 1990s, a new species from Asia, *Pseudodiaptomus inopinus*, replaced the native copepods. But in the past 10 years, two other nonnatives from Asia, *Sinocalanus doerri* and *P. forbesi*, had replaced *P. inopinus*. An important question is what these changes are doing to native fishes.

There appears to be a lag time in the spread of some nonnative species. In the early 1990s, New Zealand mudsnails appeared in the lower Columbia River in one small isolated spot in Astoria. Follow-up monitoring over the next 10 years showed that the New Zealand mudsnail was not spreading, a finding that differs from what surveys elsewhere show. The picture had changed with this survey. Now, significant numbers of New Zealand mudsnail are found in the Columbia and Snake rivers.

Future monitoring includes targeted sampling, every three to five years, of habitats and taxa that are likely to contain new invaders; a comprehensive survey of the study area every 10 years that would expand sampling beyond target groups; and discrete sampling projects that target data gaps and survey limitations of the LCRANS project. Heimowitz displayed a map of proposed monitoring stations that could become permanent stations.

Based on additional USFWS funding, a related survey has begun for the mid-Columbia and lower Snake rivers. Four major reservoirs occur on the lower Snake River, which experiences a significant amount of barge traffic. A literature survey is underway, and sampling will follow. Researchers are looking particularly closely at barge traffic as a means of spreading nonnative species into these upper reaches. It was suggested that Heimowitz and Al Cofrancesco, ACOE, work closely on an ACOE barge study for the Columbia/lower Snake rivers.

2004–2005 Hawaii Harbor Surveys

Heimowitz also talked about the marine introduced species surveys in Hawaiian harbors. He was delivering this report on behalf of principal investigators Steve Coles and Lu Eldredge with the Bishop

Museum. Before this project, no systematic NIS surveys had been conducted on Hawaiian coral reefs near harbors other than those on O'ahu. This project provided the opportunity to evaluate pathways of inter-island transshipments relative to the international harbors of O'ahu.

Observations were made and samples collected from the harbors and nearby reefs of Kaua'i, Moloka'i, Maui, and Hawai'i. The surveys were conducted from November 2002 to June 2003, and a report was submitted in November 2004. USFWS funding was matched by the Hawai'i Community Foundation. A total of 1,039 taxa were identified from all sites, and 872 of these were identified to the species level. Of the species identified, 112 were introduced or cryptogenic (10.9%). The proportion of introduced and cryptogenic species increased from reef to harbor sites where they ranged up to 36% of the total taxa, indicating that inter-island shipping is spreading species from international harbors to noninternational harbors. In addition, the number and percent composition of introduced species decreased in harbors with increasing ocean exposure. Eight new records came about through these surveys. To date, few of the nonnative species documented seem to be causing significant impacts. But the effort did demonstrate the difficulty in predicting NIS distribution and impacts, especially at a small scale. The final report is available at <http://hbs.bishopmuseum.org/pdf/tr29.pdf>.

A final survey was added this year with matching funds from the Hawaii Department of Land and Natural Resources. Surveys of Lana'i were conducted from February to March 2005. Samples were collected from two sites in Kaunapali Harbor, two sites near Manele Harbor, and four reef sites around Lana'i. Although a progress report was submitted in March 2005, the samples were still being sorted and identified. Based on field observations, 190 taxa were identified from all sites. Seven of the species (3.7%) were introduced or cryptogenic, with a maximum of 6.7% at a site near Manele Harbor. Invasive algae that dominated the reefs on the south and west side of Maui were not found at any of these sites.

Several conclusions have been drawn so far. Nonindigenous and cryptogenic species are as abundant and comprise a similar proportion of the total biota in commercial harbors of neighboring islands as they are on O'ahu. Numbers and percentages of these species decrease with exposure to the open ocean. And they appear to be only a minor component of the total marine biota on Lana'i.

Following the presentation, the following issues were discussed:

- Researchers must be careful about drawing conclusions too soon after surveys are performed.
- Congress has asked NOAA about the effectiveness of BW exchange policies. Given that the rules went into effect in September 2004, the question cannot yet be answered. Nor is it always possible to determine whether a species was introduced via BW rather some other pathway. Another complicating issue is that a species may be introduced through BW but spread through other routes. The work that Henry Lee, USEPA, is doing may help look at that issue. It will likely take several years or even decades of annual survey data to evaluate the effectiveness of BW exchange, yet Congress and others will undoubtedly continue asking.
- It might be worth looking at the overlap between species found during the surveys and those found in BW. Control management and eradication efforts are only effective if invasion pathways are known.

Meeting Wrap-Up

Before adjourning, the ANSTF requested public comment, thanked those who helped organize and run the meeting, reviewed action items, and listed potential agenda items for the fall 2005 meeting.

- **Public Comment**—No one provided public comment.

- **Meeting Productivity**—Several members expressed their appreciation for the WRP’s efforts and hospitality. Others commented on the productivity of the meeting and the interactions at breaks that were as valuable as the formal discussion. Parker specifically thanked Dan Diggs for leading the first day of the meeting and her fisheries staff for their planning and organizing efforts. The ANSTF could not function without them. People were reminded to update their information on the membership list.
- **Action Items**—Don MacLean, USFWS, reviewed the following action items (by category):

ANSTF Annual Report

- Get the draft annual report out to ANSTF members by the end of June.
- Develop a timeline/process for developing information for future annual reports (attempting to get the report out by the end of each calendar year).
- Develop a template/structure for information requested for the annual report.

Control Committee

- Give IAFWA 60 days to see if they can find a Control Committee chair.
- Charge Steve Kendrot, APHIS, with determining whether a nutria control committee is necessary (including developing a scoping meeting, potential membership, and potential responsibilities if a national management plan is deemed unnecessary).
- Once the Control Committee is formed, have its members decide whether to add restoration to its name or to create a restoration working group.

State ANS Management Plans

- Work with regional panels and their state contacts to get input on the revision process for state ANS management plans.
- Get comments on the North Dakota ANS management plan to the Executive Secretary by June 15, 2005.
- Get comments on the Kansas ANS management plan to the Executive Secretary by July 1, 2005.

Miscellaneous Action Items

- (Web Page Working Group) Continue website development, including dealing with site update/maintenance issues and looking for software to help manage links.
- Seek participation from the DHS Borders/Customs in the Stop Aquatic Hitchhikers! campaign.
- (ANSTF co-chairs) Send letter to the DFO, MARAD, and NPS regarding membership status.

- **Potential Agenda Items for the Fall Meeting**—MacLean also reviewed potential agenda items for the next meeting:
 - Discussion of the process and template for future annual reports (developed before the next meeting).
 - Update on the website.
 - Discussion on regional panel priorities.
 - Update on the 100th Meridian Initiative.
 - Meeting with heads of the regional panels.

ANSTF members reviewed these lists for accuracy and approved them as shown above. They then talked about when and where to have the fall meeting.

Regarding location, it was suggested that the MARP host the meeting in Baltimore to allow an opportunity for a field trip and some presentations about that region. Julie Thompson, USFWS, agreed to look into a field trip to the Blackwater National Wildlife Refuge or SERC if the ANSTF decides to meet in Baltimore. On the other hand, the fall meeting tends to have a full agenda, with priorities, budgets, and a meeting with regional panel heads. One suggestion was to put reports from regional panels and ex officio members (and accompanying Microsoft® PowerPoint presentations) on a CD to distribute to ANSTF members in advance so that time could be spend on discussions. However, since the regional panels and committees make up the heart of ANS efforts, the group was cautioned against providing too little time for those updates.

Dates proposed for the next meeting included the weeks of October 17, 24, and November 14. Since October 17 falls the week after the ISAC meeting, some members preferred the week of November 14. The week of October 24 generally worked for people as well.

ACRONYMS USED

ACOE	U.S. Army Corps of Engineers	HR	House of Representative bill
AIS	aquatic invasive species	IAFWA	International Association of Fish and Wildlife Agencies
ANS	aquatic nuisance species	ISAC	Invasive Species Advisory Committee
ANSTF	Aquatic Nuisance Species Task Force	LCBP	Lake Champlain Basin Program
APHIS	Animal Plant and Health Inspection Service	MARAD	U.S. Maritime Administration
AZGFD	Arizona Game and Fish Department	MARP	Mid-Atlantic Regional Aquatic Nuisance Species Panel
BW	ballast water	MOU	memorandum of understanding
BWM	ballast water management	MRBP	Mississippi River Basin Panel
CADFG	California Department of Fish and Game	NAISA	National Aquatic Invasive Species Act
CBP	Chesapeake Bay Program	NANPCA	Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990
CEO	Communication, Education and Outreach	NASAC	National Association of State Aquaculture Coordinators
CNO	California/Nevada Operations Office of the USFWS	NEANS	Northeast Aquatic Nuisance Species Panel
CORA	Chippewa Ottawa Resource Authority	NEPA	National Environmental Policy Act
CSLC	California State Lands Commission	NGO	nongovernmental organization
DFO	Fisheries and Oceans Canada	NIS	nonindigenous species
DHS	U.S. Department of Homeland Security	NISA	National Invasive Species Act of 1996
DOI	U.S. Department of the Interior	NISC	National Invasive Species Council
DOT	U.S. Department of Transportation	NM	nautical miles
EO	Executive Order	NOAA	National Oceanic and Atmospheric Administration
ETV	USEPA's Environmental Technology Verification Program	NOBOB	vessel with "no ballast on board"
EU	European Union	NPS	National Park Service
FACA	Federal Advisory Committee Act	OMB	Office of Management and Budget
FY	fiscal year	OSU	Oregon State University
GLC	Great Lakes Commission	PIJAC	Pet Industry Joint Advisory Council
GLP	Great Lakes Panel	PSU	Portland State University
GSARP	Gulf and South Atlantic Regional Panel	RFP	request for proposal
GSMFC	Gulf States Marine Fisheries Commission	SERC	Smithsonian Environmental Research Center
HACCP	Hazard Analysis Critical Control Points	SFEP	San Francisco Estuary Project

USCG U.S. Coast Guard
USDA U.S. Department of Agriculture
USEPA Environmental Protection Agency
USFS U.S. Forest Service
USFWS U.S. Fish and Wildlife Service
USGS U.S. Geological Survey
WRP Western Regional Panel

SPECIES LIST

alewife	<i>Alosa pseudoharengus</i>	hydrilla	<i>Hydrilla verticillata</i>
armadillo del rio	<i>Hypostomus</i> sp.	largemouth bass	<i>Micropterus salmoides</i>
Asian clam	<i>Corbicula fluminea</i>	lionfish	<i>Pterois volitans</i>
Australian tube worm	<i>Ficopomatus enigmaticus</i>	Japanese mudsnails	<i>Batillaria attramentaria</i>
bighead carp	<i>Aristichthys nobilis</i>	Japanese mystery snail	<i>Cipangopaludina japonica</i>
black carp	<i>Mylopharyngodon piceus</i>	Mayan cichlid	<i>Cichlasoma urophthalmus</i>
blue catfish	<i>Ictalurus furcatus</i>	mute swan	<i>Cygnus olor</i>
bluegill	<i>Lepomis macrochirus</i>	New Zealand mudsnail	<i>Potamopyrgus antipodarum</i>
blue tilapia	<i>Oreochromis aureus</i>	northern pike	<i>Esox lucius</i>
Brant's cormorant	<i>Phalacrocorax penicillatus</i>	Northern seal lion	<i>Eumetopias jubatus</i>
brown hoplo	<i>Hoplosternum littorale</i>	nutria	<i>Myocastor coypus</i>
brown pelican	<i>Pelecanus occidentalis</i>	phragmites	<i>Phragmites australis</i>
brown trout	<i>Salmo trutta trutta</i>	poison hemlock	<i>Conium maculatum</i>
bullfrog	<i>Rana catesbeiana</i>	purple loosestrife	<i>Lythrum salicaria</i>
California clapper rail	<i>Rallus longirostris obsoletus</i>	rainbow trout	<i>Oncorhynchus mykiss</i>
California sea lion	<i>Zalophus californianus</i>	redbelly tilapia	<i>Tilapia zillii</i>
California sea otter	<i>Enhydra lutris nereis</i>	red-eared slider	<i>Trachemys scripta elegans</i>
channel catfish	<i>Ictalurus punctatus</i>	red shiners	<i>Cyprinella lutrensis</i>
Chinese mitten crab	<i>Eriocheir sinensis</i>	Rio Grande cichlid	<i>Herichthys cyanoguttatus</i>
Chinese mystery snail	<i>Cipangopaludina chinensis</i>	round goby	<i>Neogobius melanostomus</i>
cichlids	<i>Cichlasoma</i> spp.	ruffe	<i>Gymnocephalus cernuus</i>
coqui	<i>Eleutherodactylus coqui</i>	sailfin catfishes	<i>Pterygoplichthys</i> spp.
Cuban treefrog	<i>Osteopilus septentrionalis</i>	saltcedar	<i>Tamarix</i> spp.
egeria	<i>Egeria densa</i>	seagulls	<i>Larus</i> spp.
eucalyptus	<i>Eucalyptus globulus</i>	sea lamprey	<i>Petromyzon marinus</i>
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>	sea otter	<i>Enhydra lutris</i>
fennel	<i>Foeniculum vulgare</i>	silver carp	<i>Hypophthalmichthys molitrix</i>
flathead catfish	<i>Pylodictis olivaris</i>	slender-leaved iceplant	<i>Mesembryanthemum nodiflorum</i>
Forster's tern	<i>Sterna forsteri</i>	smallmouth bass	<i>Micropterus dolomieu</i>
giant reed	<i>Arundo donax</i>	smelt	<i>Osmerus eperlanus</i>
grass carp	<i>Ctenopharyngodon idella</i>	northern snakeheads	<i>Channa argus</i>
greenhouse frog	<i>Eleutherodactylus planirostris</i>	spartina	<i>Spartina anglica</i>
green sunfish	<i>Lepomis cyanellus</i>	spotted tilapia	<i>Tilapia mariae</i>
harbor seals	<i>Phoca vitulina</i>	sturgeon	<i>Acipenser</i> spp.
herring	<i>Alosa aestivalis</i>		

swamp eels
tule elk
water chestnut
water hyacinth
western grebe

Monopterus albus
Cervus nannodes
Trapa natans
Eichhornia crassipes
Aechmophorus
occidentalis

whitefish
white perch
zebra mussel

Coregonus
clupeaformis
Morone americana
Dreissena polymorpha