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## AQUATIC NUISANCE SPECIES TASK FORCE: MINUTES OF THE 2007 FALL MEETING

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On November 6–8, 2007, the ANSTF met at the U.S. Fish and Wildlife office in Washington, DC. This document includes the following sections:

- Summary of the three-day ANSTF meeting
- Lists of acronyms used and species mentioned

### ANSTF FALL MEETING NOVEMBER 6–8, 2007

#### Decisions

The ANSTF made the following decisions:

- Approved the meeting agenda.
- Approved the May 2007 ANSTF meeting minutes.
- Approved the following statement regarding viral hemorrhagic septicemia: “VHS and other nonnative pathogens are recognized as aquatic nuisance species, and the states are encouraged to consider VHS and other nonnative pathogens in their aquatic species management plans, and to develop targeted Hazard Analysis and Critical Control Point (HACCP) plans to address the spread within their states as appropriate.”
- Approved the Management and Control Plan for Bighead, Black, Grass, and Silver Carps in the United States.
- Approved the Idaho Aquatic Nuisance Species Management Plan.
- Conditionally approved the Rhode Island Aquatic Invasive Species Management Plan, pending Governor Carcieri’s signature.
- Conditionally approved the California Aquatic Invasive Species Management Plan, pending Governor Schwarzenegger’s signature.
- Recommended that the USFWS, when funding the implementation of approved state aquatic nuisance/invasive species management plans, continue using the current allocation methodology of each plan receiving an equal portion of available funds.

#### Action Items

- (Executive Secretary) Work with Sharon Gross, USGS, to provide a summary of the recommendations from the “Climate Change and Invasive Species” breakout groups. Members will be asked to review and comment on these recommendations with an eye toward determining which should be advanced as ANSTF recommendations to agencies and/or Congress.
- (Executive Secretary) Work with ANSTF members to reinvigorate the Task Force’s standing committees.
- (Executive Secretary) Prepare a letter to federal agencies requesting information about their equipment decontamination protocols and ask those with established protocols to include language in all permits and/or contracts that requires equipment decontamination when equipment will be moved between waterbodies.

- (Jonathan McKnight, Mid-Atlantic Regional Panel) Provide regional panels with background information on how the Mid-Atlantic Regional Panel developed its lists of prohibited or restricted species. Regional panels are asked to consider the feasibility of developing similar lists.
- (ANSTF) Consider the Mississippi River Basin Panel's recommendation that the ANSTF should encourage agencies to incorporate commercial harvest guidelines while developing tools to manage and control ANS. Be prepared to make a formal decision at the spring 2008 ANSTF meeting. The guidelines are available on pages 7 and 8 of the following:

[http://anstaskforce.gov/Meetings/2007\\_Nov/Regional\\_Panel\\_Recommendations.pdf](http://anstaskforce.gov/Meetings/2007_Nov/Regional_Panel_Recommendations.pdf)

- (Dean Wilkinson, NOAA) Follow up with those federal agencies who have not submitted information on authorities/regulations that need to be considered in conducting response operations.
- (Executive Secretary/USFWS) Distribute the Management and Control Plan for Bighead, Black, Grass, and Silver Carps in the United States and work to stand up an implementation team by February 1, 2008.
- (Mississippi River Basin Panel) Work to develop a formal recommendation regarding common carp management and present at the spring 2008 ANSTF meeting.
- (Executive Secretary) Taking into account the recommendations of regional panels, draft revised guidelines for the development of state ANS management plans.

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## November 6 Welcome and Preliminary Business

Co-chair Tim Keeney, NOAA Deputy Assistant Secretary for Oceans and Atmosphere, welcomed participants and thanked meeting organizers. He informed the group that Mamie Parker, former ANSTF co-chair, has retired from her position as Assistant Director of Fisheries and Habitat Conservation for the USFWS. The acting Assistant Director, Gary Frazer, was unable to attend, so his alternate, Everett Wilson, Deputy Director of Fisheries and Habitat Conservation, served as co-chair. Wilson commented that Frazer is knowledgeable of ANS issues and excited about co-chairing the Task Force. Keeney also introduced Hannibal Bolton, USFWS Division Chief of Fish and Wildlife Management and Habitat Restoration.

Following introduction of ANSTF members and observers, Keeney introduced three new members of the ANSTF: Winnie Lau, Department of State; David Rice, Gulf States Marine Fisheries Commission; and Chris O'Bara, Mississippi Interstate Cooperative Resource Association. Executive Secretary Scott Newsham announced that Al Cofrancesco, U.S. Army Corps of Engineers, could not attend, and Commander Vickie Huyck, USCG, would be delayed. Then the agenda for this meeting and the minutes for the spring 2007 meeting were approved.

## Climate Change and Invasive Species Presentations

Co-chair Keeney introduced the day's focus on climate change relative to invasive species. The issue of global climate change has been highlighted by the Nobel Peace Prize awarded to Al Gore and several NOAA scientists. It has also been the topic of discussion at several meetings he has attended. At these meetings, he has learned that the board of the National Fish and Wildlife Foundation is rethinking how to invest its funds, based on effects of global climate change, and that the issue has been of great concern for island communities because of their low elevation and rising sea levels.

Sharon Gross, USGS, reviewed the agenda for the day. During the morning session, presentations were planned on the adaptability of current state ANS management plans (SMPs) to incorporate the implications of climate change; the vulnerability of northern ecosystems to invasive species as the climate changes; and ongoing and future research examining interactions among climate change, ANS, and flow regime management. In the afternoon, breakout groups would discuss how climate change will affect the prediction and mapping of ANS, management strategies, and research needs.

### *A Primer on Global Climate Change*

Michael Slimak, USEPA National Center for Environmental Assessment, reported on his views of climate change relative to invasive species and provided scientific support for these views. The earth is warming, and the climate is changing with a regional texture. Anthropogenic global warming is due to excess greenhouse gases, of which carbon dioxide is the most important. Climate change and invasive species are inextricably linked. As climate changes, we can expect ecosystem changes. Some ecosystem responses have also been observed—in earlier spring bud-burst dates, rising relative sea levels, increased hurricane energy, decreased snow water equivalent, and others. Ecosystem changes result in shifts in plant and animal distributions, and rapid ecosystem change favors species with high genetic plasticity. Unfortunately, many successful invaders display this high plasticity. Therefore, climate change will have a profound impact on the co-evolution of ecosystems and their components.

Slimak also talked about reports now or soon available by the federal Climate Change Science Program and the Intergovernmental Panel on Climate Change on climate change issues. Reports 4.3 (impacts on agriculture, biodiversity, and land and water resources) and 4.4 (adaptation options for climate-sensitive ecosystems) from the Climate Change Science Program have sections on ANS. The 2007 Intergovernmental Panel on Climate Change assessment includes a chapter on freshwater systems and management.

Then Slimak displayed various graphs and figures to illustrate ecosystem changes in the United States related to climate change. Effects include increased temperatures in most regions, more common extremes in storms and droughts, earlier snowmelt in some areas, changes in runoff, and a shift from snowfall to rainfall in the Southwest. Changes in air temperature also influence water temperatures, while other climactic changes can affect water quantity, quality, flow, and pH. He elaborated on these effects in streams.

So is it possible to reduce impacts to aquatic ecosystems? Report 4.4 of the Climate Change Science Program evaluates adaptation options. Among those options are reducing impacts from other stressors (such as pollution, acidification, desertification, eutrophication, and invasive species); maintaining habitat connectivity, population sizes, and genetic diversity; and restoring habitat.

Two main questions were raised during the ensuing discussion:

- With ecosystem changes and species adaptation/movement, does it become more difficult to label something an “invasive”?
- How do we address human behavioral changes caused by climate change (such as the opening of the Northwest Passage and resulting changes to the shipping industry)?

### ***Link Between Climate Change and Invasion Risk in Alaska***

Denny Lassuy, USFWS Alaska Region Invasive Species Program Manager, gave the Alaska perspective on global warming since it is a visible “epicenter” of climate-driven change. Lassuy started with what Alaska hopes to protect—and it is a lot—62% of all U.S. wetlands and 70% of all U.S. intertidal mudflats (both are essential feeding and rearing habitat to millions of migratory birds), 43,000 miles of coastline, 3,000,000 lakes and 3,000 rivers, and no endangered fish (yet). It is also very important economically, serving as a major international hub for air and marine transportation and shipping, as well as offering unique recreation opportunities. So the effects of species invading as a result of global climate change could be devastating.

These effects are already being seen in Alaska. Lassuy talked about the loss of glaciers and anchor ice to protect the coast from erosion. Most aspects of global change are likely to favor invasive species and exacerbate the impacts of invasions on ecosystems. So far, no Chinese mitten crabs or European green crabs have been found in Alaska waters. But if water temperatures rise even modestly due to climate change, many Alaska waters will be at risk of invasion by both of these invasive crabs. Alaska’s first ever infestation by purple loosestrife was found in 2005, and whirling disease was detected in Alaska for the first time at the Elmendorf State Fish Hatchery in 2006. In the 1980s, it was thought that Alaska was too cold for purple loosestrife to set seed and reproduce. When it was discovered in 2005 that in fact it had, citizen-focused efforts to eradicate it were immediately begun. By 2007, the species had been officially designated a noxious weed and banned from sale. In the case of whirling disease, the Alaska Department of Fish and Game immediately altered its stocking pattern for fish produced at this facility.

Lassuy also talked about two tunicates, one of which has been found in Alaska (*Botrylloides violaceus*). This species has been determined to benefit from warming waters and is expected to expand its range in Alaska. The other tunicate, *Didemnum* sp. (aka “marine vomit”), has not yet been detected. Warmer temperatures may also weaken native salmon stocks by affecting their metabolic rate, development and growth, and susceptibility to disease. This is a significant concern in the Yukon River, which supports Alaska Native subsistence fisheries as well as an international salmon fishery shared with Canada.

Lassuy then talked about what could be done. He believes that considering the potential to introduce invasives needs to become a mindset in any management or development decisions, through strategies such as hazard analysis and critical control point plans. The primary drivers of invasion, especially in the

face of a warming climate, will be new development: new or expanded ports, liquefied natural gas tankers and pipelines, offshore oil and gas facilities, new mines, and of course roads to maintain increased development. New development will require equipment brought in from other places. With climate change and increased population, Alaska will likely see more ships coming into the state and even entirely new shipping routes opening up (such as an ice-free Northwest Passage). Concerns associated with more ships and routes include ballast water sources of invasion, biofouling, and other invasive hitchhikers such as rats.

While Alaska is facing increased invasion, for now it has relatively fewer invasives than most states. So the most effective work needs to focus on prevention, early detection, and rapid response. However, because Alaska is so expansive, little baseline data are available and detection is likely to be prohibitively expensive for any one agency to undertake. Valid baseline data are urgently needed if we are to effectively respond to climate-driven invasions. Lassuy offered that the only realistic option for gathering baseline data was through highly leveraged and partnered efforts. Also, to implement an effective detection/response network, we must enable citizens to play an active role.

Ensuing discussion focused on the lack of baseline data, especially for the Northwest Passage, and the need for a regional approach. Lassuy added that key words in the discussion of global warming and invasion are “change” and “uncertainty.” Discussions of global warming always center around the change we know it will bring, despite the uncertainty around its specific effect. The same is true of invasive species. He also talked about how essential good working relationships are and how that helped in the close-knit community in Alaska. For example, purple loosestrife was discovered on Thursday of one week, and by the next Thursday, around 15 organizations were pulling the weed. When asked how to know whether a species is invasive, given changing ecosystems, Lassuy noted that under Executive Order 13112, for a species to be invasive, it arrived in the receiving ecosystem at the hand of humanity (that is, as the result of an “introduction”), rather than through its own migration processes.

### ***Predicting Potential Effects of Global Climate Change on Invasive Species Distributions***

Patrick Shafroth, USGS Fort Collins Science Center, first reviewed key climatic, hydrologic, biotic, and landscape factors that influence species distributions in aquatic and riparian ecosystems. Under global climate change, we will likely see more extreme floods and droughts. And increased temperatures will affect the hydrology of rivers and lakes, as well as the phenology and evolution of biota. Among various landscape factors, streamflow regulation has already wrought significant changes in ecosystems, which will be further affected by climate change.

Shafroth then previewed work done by Tom Stohlgren’s (USGS) group with various models, with the objective of providing managers with information they need regarding potential invasive species (possibly via watch lists). The Invasive Species Branch at the Fort Collins Science Center recently opened the *Advanced Invasive Species Modeling Room* on its website. This “room” is dedicated to facilitating the development and dispersal of models used to estimate future ANS distribution relative to climate change. It will also guide use of model results. Because of variation among model results, researchers seek to determine which models work best for which situations and datasets. Shafroth displayed graphs and distribution maps generated for various species, including Asian carp, a freshwater diatom (*Didymosphenia geminata*), burmese python, cane toad, and others. Overall, the process for predicting potential effects involves multiple spatial scales with multiple modeling approaches to bracket results and estimate uncertainty.

Bioclimatic distributional models represent a good first approximation, but more mechanistic, process-based approaches are often needed to understand invasion success at more local scales. Shafroth discussed two projects, one of which is in the proposal phase:

- Predicting relative risk of invasion by saltcedar and New Zealand mudsnails in river networks under different scenarios of climate change and dam operations in the western United States (integrating climate, streamflow, water management, and biotic response models for tamarisk and New Zealand mudsnails; USEPA STAR grant—proposed/in review; N. LeRoy Poff, principal investigator).
- Determining hydrologic thresholds for biodiversity in arid and semiarid riparian ecosystems: importance of climate change and variability (integrating climate, streamflow, groundwater, and biotic response models for southwestern riparian vegetation; USEPA STAR grant; T. Meixner, principal investigator).

Shafroth then summarized key points. Temperature and precipitation changes due to climate change are likely to significantly affect the distribution and abundance of invasive taxa. Using the present and past to predict the future is often the best we can do, but the future is likely to be different enough to require significant adaptation to change. Numerous models can effectively integrate large-scale environmental data from the current range and native range to predict likely future distributions. But bioclimatic models generally cannot account for factors such as biotic interactions, dispersal, evolutionary change, or key river reach-scale hydrologic and geomorphic processes. Mechanistic models linking climate predictions, hydrology, land use, water management, and biotic factors are being developed to examine scenarios at more local scales. Because of uncertainty in climate change predictions, especially precipitation at local scales, examining multiple scenarios is important. Finally, water management may exacerbate the spread and/or success of invasive species, but it can also be used as a tool (such as “environmental flows”) to help adapt to future changes.

After the presentation, discussion focused on the need for adaptive management and monitoring. Shafroth added that we all need water, biologically and economically. Because sustenance of those systems is critical for sustenance of humans, we need more integration of social, environmental, and other considerations in water management.

### *Climate Change and Effects on Aquatic Ecosystems*

Britta Bierwagen, USEPA, talked about a forthcoming report written by the Global Change Research Program within the USEPA Office of Research and Development and the Environmental Law Institute regarding effects of climate change on AIS and implications for management and research. The USEPA chose to focus on AIS since the agency implements the Clean Water Act, and AIS are issues in ballast water and National Pollutant Discharge Elimination System permits, total maximum daily loads and impaired water findings, some economic and biological projects, and the pesticide program. The report includes information from two workshops, a literature review, an inventory of state-level AIS management activities, and an analysis of state AIS management activities and state and regional ANS management plans. The report has already undergone internal USEPA review, was available for public comment, and is now in external peer review. The report is scheduled for publication in early 2008.

Bierwagen summarized how information was collected and analyzed. She then discussed five key lessons from the workshops and analysis:

- Climate change will affect AIS throughout the invasion pathway. Bierwagen reiterated a number of effects that previous presenters had discussed, such as increased water temperatures, changes in precipitation timing and amount, and decreased pH. These effects will vary regionally and seasonally, but all will influence ecosystems. For some AIS, these effects will create opportunity; for others, they may create unsuitable conditions.

- Important research gaps exist in understanding climate change effects and interactions with other stressors. Other stressors include land-use changes; water quality changes; and human-induced disturbances, such as fire, channelization, and dams.
- Most AIS activities do not take climate change effects into account, potentially jeopardizing management goals.
- Capacity exists to incorporate this information, although tools may not.
- More information is needed on impacts and adaptation options for effective management.

She shared research recommendations coming from the workshops. Essentially more information and research are needed on effects of climate change on AIS management activities, each step in the invasion pathway, AIS impacts (ecological and economic), specific species and invaded ecosystems, and interacting stressors. Next steps might be follow-on case studies and workshops to provide information on revising SMPs to account for climate change effects. In addition, U.S. Environmental Protection Agency STAR and U.S. Department of Agriculture grants will be awarded on this topic.

The issue of timescales for SMPs was raised. SMPs generally have a three-year window. Bierwagen responded that effects of climate change are already being seen. Also, some elements of the plans have longer performance periods, such as habitat restoration, which will be affected by climatic changes. Those plans with short-term timetables should be used to implement monitoring to tease out effects we're already seeing. The goal of the USEPA solicitation for proposals is to identify tools that will help management at a more useful scale.

Sharon Gross thanked the presenters and reiterated several points to consider during the afternoon breakout sessions:

- Uncertainty and adaptive management
- Monitoring data for making timely decisions
- Differing scales and how they affect decision-making at the local level
- Priorities and how they'll change in SMPs (vectors, stressors, etc.)

### **Climate Change and ANS Breakout Sessions**

Following lunch, ANSTF and audience members were invited to participate in two rounds of breakout sessions. People could choose one of three groups to attend: prediction and mapping, management strategies, or research needs. Newsham requested that the groups develop recommendations that could be included in the next ANSTF report to Congress.

During discussions, deliberations focused on issues related to: uncertainty and the use of adaptive management methods; the need for additional monitoring data; the impact of differing scales on decision-making at the local level; and how priorities may change in State Invasive Species Management Plans.

After an hour of discussion, a representative from each group shared results of their preliminary brainstorming in a plenary session. Others asked clarifying questions or provided additional input. Then people reconvened for the second round of breakout sessions, this time to refine their recommendations based on input they had received. Final recommendations were shared in the second presentation to the plenary.

#### ***Prediction and Mapping***

This breakout group agreed that the use of modeling is critical in mapping and predicting the spread of invasive species due to changes in climate. While these efforts have proved useful and may become

valuable tools to assist in management efforts, significant uncertainty exists and decision makers will have to determine what level of uncertainty is acceptable. There is much work that can be done to improve the models and agencies must work together to address these needs.

- Modeling to predict the impact of climate change is improving, but efforts must continue to improve models and identify opportunities to reduce uncertainty in the modeling efforts. Options to help improve models include: identify both physical and biological parameters; coordinate and incorporate data sources not currently being utilized; evaluate data density underlying predictions and identify gaps; develop models with shorter timeframes and utilize adaptive management techniques to help resource managers make decisions; and improve models through validation.
- Watch lists are an important tool to help managers prioritize ANS at the regional and local levels. Efforts should be encouraged to initiate and guide development of watch lists.

### ***Management Strategies***

This breakout group emphasized the overarching need for effective partnering, leveraging, and outreach, particularly by means that enable citizen involvement. They also emphasized the need for management strategies to be flexible and agile. It is important to design management actions utilizing an adaptive management framework.

- Use climate change and its challenges to heighten ANS as an issue – change and uncertainty are key concerns of management, and key impacts of both climate change and invasion. To increase relevancy, package climate change with the urgency of ANS to deal with change and uncertainty and recognize that all the priorities for ANS need to be accelerated.
- Identify, clarify, and fix gaps in statutory authorities at the international, national, interstate, and local levels. For example, at the federal level, screening laws need to reverse burden of proof, set and enforce international shipping standards, and provide sufficient resources for inspections even under current laws.
- Recognize the need for targeted, flexible, and coordinated monitoring responsive to management needs (efficacy of prevention tools, effective early detection, provision of insight to management decisions on control). Look to existing programs (such as the Natural Resource Management Partnership, AFWA), and ensure that all broader monitoring programs also include ANS in a meaningful way.
- Consider the ANS implications of our reactions (adaptive or mitigative) to climate change and ensure that our reaction does not worsen the movement of species or limit the ability of native species to respond. For example, consider the ANS implications of wetland plant species used in alternative fuel generation.

### ***Research Needs***

This group suggested that detailed research recommendations should be referred to the ANS Task Force Research Committee for more in-depth consideration. The following recommendations represent critical issues and starting points for the Committee as they begin their deliberations.

- Bring together managers, decision-makers, and scientists to discuss what research is needed to make good management decisions.

- Discuss options for funding research priorities that involve many different agencies including using existing mechanisms and encouraging joint RFP projects.
- Conduct sociological research to identify or clarify values, especially regarding ecosystem services.
- Develop a common work plan for the types of monitoring that should be done at a state and local level. This would promote some consistency at the national level.

The ANS Task Force anticipates that State and Federal agencies, and other affected entities will begin to address some of the issues outlined in these recommendations and help advance the science and management of ANS and climate change.

### **November 7 Welcome and Committee Matters**

Co-chair Keeney welcomed participants to the second day of the meeting. He said that the five standing committees were created to respond to specific mandates of the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990. This past year, three of the committees have been inactive, while the Prevention Committee and Detection and Monitoring Committee have made some progress. Dorn Carlson, NOAA, stepped down as Research Committee chair, saying that David Reid, NOAA Great Lakes Environmental Research Laboratory, was interested in the post. Executive Secretary Newsham asked the ANSTF to discuss whether committees should be standing or ad hoc and how to revitalize standing committees if they remain.

During the discussion, several challenges were raised and suggestions made:

#### **Challenges**

- Lack of clarity about the roles of the ANSTF and standing committees.
- Lack of commitment from member agencies to support committee work.
- Sporadic participation of members (often because of collateral duties).
- Unclear priorities and tasks.

#### **Suggestions**

- Identify benefits that the ANSTF is likely to gain from committees and then determine whether those benefits are more likely to come from standing or ad hoc committees.
- Use discussion and recommendations from the previous day's discussion of climate change and ANS to jumpstart committees, especially the Research Committee.
- Review committee charges, which were validated at the fall 2006 meeting, so that people agreeing to serve on committees know what they're supposed to do.
- Have committees review the strategic plan and/or develop annual work plans to focus their work.
- Review current membership rosters and request additional members, if necessary.
- Have at least one person from each regional panel on a committee to facilitate better coordination with these entities.

Following discussion, the ANSTF agreed to continue with standing committees. Newsham will provide the committee charges via email and request names of people to participate actively. His objective is to assess the interest of agencies to serve.

## Experts Database

An action item at the spring 2007 ANSTF meeting was to prepare a letter for co-chairs' signatures to be used in recruiting Tier 2 experts for the experts database and lending credibility to the product. The letter has had the desired impact and Newsham stated that about 600 experts (both Tier 1 and 2) are now registered. The database is being used for its intended purpose of putting people in contact with the appropriate ANS expert who can help them. Pam Fuller, USGS, was thanked for working on the database and speaking to various groups about it.

## Regional Panel Issues and Recommendations

Newsham provided a list of regional panel recommendations that had been submitted the week before the meeting. In the future, he hopes that these recommendations are provided early enough for review prior to the ANSTF meeting. Representatives from the regional panels introduced and explained their recommendations.

**Viral Hemorrhagic Septicemia Virus**—The Western Regional Panel requested that the ANSTF recognize this pathogen as an ANS and as a severe threat to the natural resources of North America, in addition to encouraging states to incorporate the VHS virus into their ANS management plans. The Mississippi River Basin Panel advanced the same recommendation. Eileen Ryce, Montana Fish, Wildlife, and Parks, talked about the inconsistency among western states in coordinating ANS and fish health programs. Recognizing the pathogen would raise states' awareness and promote coordination among various programs. Gary Egrie, APHIS, spoke about possible complications regarding authority and management. APHIS has authority over plant and animal pathogens, but three agencies oversee management (APHIS, NOAA, and USFWS). Listing one pathogen could be a "slippery slope," due to the sheer number of introduced pathogens. Egrie thought that the ANSTF could promote animal health in a more holistic approach rather than recognizing specific species. Following lively discussion and numerous edits, the ANSTF agreed on the following statement:

VHS and other nonnative pathogens are recognized as aquatic nuisance species, and the states are encouraged to consider VHS and other nonnative pathogens in their aquatic species management plans, and to develop targeted Hazard Analysis and Critical Control Point (HACCP) plans to address the spread within their states as appropriate.

**Agency Decontamination Protocols**—Ryce also discussed movement of contaminated equipment between waterbodies as a significant vector for introducing ANS. The Western Regional Panel requested that the Task Force develop a document of all the member agencies' decontamination policies, provide copies for local ANS managers to reference, emphasize the policies, and provide language requiring decontamination in all permits and contracts. Following discussion about how those policies could best be shared, the ANSTF agreed to send a letter to agencies asking them to provide decontamination policies for enforcement purposes.

**Prohibited Aquatic Species Lists**—The Mid-Atlantic Regional Panel recommended that the ANSTF coordinate with the regional panels to compile states' prohibited aquatic species lists to enhance prevention efforts. Jonathan McKnight, Maryland Department of Natural Resources, reviewed the process used by the Mid-Atlantic Regional Panel to develop a priority list for control and prevention of ANS in their regions. People were supportive of the idea but added that information about species occurrences was also necessary. McKnight agreed to provide regional panels with a synopsis of how the Mid-Atlantic Regional Panel developed its lists so that they can consider the feasibility of developing similar lists.

**Commercial Harvest Guidelines**—Kim Bogenschutz, Iowa Department of Natural Resources, reviewed the Mississippi River Basin Panel's recommendation that the ANSTF encourage agencies to incorporate commercial harvest guidelines while developing tools to manage and control ANS. The

regional panel had included a draft of possible guidelines. This request was prompted by harvesting being suggested as a control method in the Asian carp national management plan. Michael Hoff, USFWS, discussed “recruitment overfishing” and the scientific basis for the method. The Task Force decided to consider the recommendation intersessionally and be prepared to make a formal decision at the spring meeting.

**Early Detection/Rapid Response**—The Northeast Aquatic Nuisance Species Regional Panel requested that the ANSTF clarify what the various federal agencies are doing regarding early detection/rapid response and how states can coordinate with them on rapid response. Larry Riley, Arizona Game and Fish Department, commented that the National Incident Management System process that formed the basis for the quagga mussel response in the Southwest worked well for coordinating a rapid response. This process has already been recognized by the ANSTF as an effective means for resolving conflict and encouraging coordination. Dean Wilkinson, NOAA, agreed to follow up with federal agencies who have not submitted information on authorities and regulations that need to be considered in conducting response operations. To date, only the USEPA, NOAA, and USCG have developed and submitted such documents.

**State Management Plans**—Several regional panels recommended that the Task Force reevaluate the SMP guidelines and address funding concerns. Two documents were provided prior to the meeting: *ANSTF Guidance for State and Interstate Aquatic Nuisance Species Management Plans* and *Developing and Revising State and Interstate Aquatic Nuisance Species (ANS) Management Plans*. Further revision of the guidelines and funding concerns were discussed later in the meeting (see page 15).

### Asian Carps Management and Control Plan

The *Management and Control Plan for Bighead, Black, Grass, and Silver Carps in the United States* was originally introduced and discussed at the spring 2006 ANSTF meeting. Greg Conover, USFWS and chair of the working group, presented revisions made to the plan since that meeting. The working group reached consensus on 49 strategies and 131 recommendations. The structure of the plan and seven goals have remained unchanged. The most noteworthy revisions were made in Chapter 3 and the appendices. Within Goal 1, three recommendations were added, three unresolved issues were deleted as recommendations, and many proposed pathway risk levels were deleted. The use of triploid black carp and triploid grass carp on aquaculture facilities and the commercial live transport of farm-raised bighead and grass carps remain unresolved issues. These unresolved issues have been moved to appendices, where they are each discussed at length. One strategy and recommendation were modified under Goal 2, one new strategy and recommendation were added to Goal 3, and one strategy under Goal 3 was revised into three new strategies for clarity. As requested by the ANSTF, a new appendix was added to the plan to summarize state regulations pertaining to the import and possession of Asian carps.

Developing the plan was a lengthy but successful process. Implementing the plan is expected to be difficult and expensive, requiring extensive coordination and collaboration. The Asian carp national management plan includes a goal addressing coordinated implementation. The goal includes one strategy and seven recommendations, including one that the ANSTF create an implementation team to provide national-level coordination and drive implementation of the plan. The revised plan was approved by the ANSTF.

The Task Force then moved to a discussion on implementing the approved plan. Kari Duncan, USFWS, initiated this discussion. While most plans requesting ANSTF approval include an implementation table, Conover had requested a waiver from this requirement. The ANSTF had approved the request, provided that developing an implementation plan would be the next step. The working group has asked that the implementation team be a smaller group of people. Conover

suggested creating an umbrella implementation team with several subgroups that focus on prevention, control, education, and outreach. Under this structure, the implementation team would have higher level representatives to maintain balance yet keep the size small. The technical teams would not be limited in size and would involve field-level participation.

Once created, the implementation team must quickly integrate and prioritize the recommendations to identify which resources are already available and which are needed. The long-term role of the implementation team would be to develop an adaptive management framework, including a table of the recommendations and their estimated costs over the first 20 years. Although this is a long-term plan, some recommendations can be implemented now, even without additional funding. To maintain the momentum of the planning process, participants suggested having the regional panels review the recommendations and identify those actions that they could immediately address.

The USFWS volunteered to lead implementation efforts. Their capacity to do so would depend on agency funding. Many state governments are probably already spending funds on Asian carp management. An important task will be coordinating efforts and ensuring the best use of funds. Participants suggested that the USGS, USEPA, and U.S. Army Corps of Engineers assist the USFWS in implementing the plan since those agencies have both authority and funding.

The USFWS agreed to distribute the approved plan to potentially interested parties and solicit their interest in participating on the implementation team. For the implementation team to convene by February 1, 2008, parties will need to reply by the end of November with statements of interest. The USFWS will solicit a co-chair representing state interests.

### Common Carp Management

Peter Sorensen, a professor from the University of Minnesota, identified the common carp as an invasive species that warrants attention from the ANSTF. Common carp were introduced by the U.S. Fish Commission in 1877 and stocked across the United States. Currently, carp are distributed throughout the country and now dominate many shallow lakes, wetlands, and rivers. A member of the Cyprinidae family, the common carp is distinct from North American minnows and Asian carp. It is distinguished by high fecundity, physiological resilience, longevity, and a specialized mouth and palatal organ used for digging and extracting food. The common carp often has devastating effects on water quality and wetland plants by digging and eating from the bottom as well as by pumping nutrients out of the sediment and into the water column to create high turbidity and algal blooms. Sorensen believes that the common carp is the single most damaging invasive fish in North America at the present time. Groups and wetland managers have unsuccessfully been attempting to control common carp (by applying poison, physically removing the fish, drawing down reservoirs, and constructing barriers to prevent movement) but have yet to reach a sustainable solution. There has been no coordination among these disparate groups.

Very little research has been conducted on the common carp. Using funding from the state of Minnesota, Sorensen set out to develop a basic understanding of carp biology and illuminate its weaknesses. In Tasmania, researchers were able to reduce populations by selectively removing females, prompting Sorensen to focus on integrated pest management strategies. Although common carp appear to reproduce every year in Minnesota, most years few (if any) young survive. Adults aggregate in winter and can be easily caught. Sorensen proposed that common carp can be controlled in a sustainable manner if their movement is blocked, recruitment is stopped, and adults are removed. There is special promise to make common carp a successful model for invasive fish control because adults are not readily replaced by recruits. Sorensen also believes there is a need to lead by example, especially for this species that was introduced by the federal government and which many think cannot be controlled.

Sorensen proposed adopting a resolution that the common carp is an invasive species (to address any confusion about its origins), facilitating coordination of ongoing efforts to understand and control the common carp, and encouraging innovative research and control. Participants noted that the ANSTF and individual agencies can address a species not formally designated as an ANS, but the first line of identification begins with individual states. Following the discussion, the ANSTF agreed that the Mississippi River Basin Panel would develop a full recommendation regarding common carp and present it at the spring 2008 meeting.

### **Nutria Management Plan**

The ANSTF authorized development of a nutria national management plan at the spring 2006 meeting. Nutria are now established in 17 states, including the southeastern United States, Oregon, and Washington. Despite having few predators and high reproduction, they can be controlled more effectively than originally thought. Steve Kendrot, APHIS, reiterated reasons for a national approach, including the broad geographic distribution; common concerns, techniques, and control efforts; and increasing interest nationwide.

He reviewed the makeup of the working group, which has representatives from federal agencies, states, nongovernmental organizations, universities, tribes, and private commercial interests. Plan goals call for a national strategy and regional programs, further legislative and regulatory measures, funding, and consistent national protocols. Of the 34 confirmed members, 18 met in August in Fort Collins, CO, to outline the plan and form subcommittees to draft sections. Paul Heimowitz, USFWS, graciously agreed to co-chair the working group and share his expertise in national management plan development. Next spring, the subcommittees will report back to plan coordinators. Then the draft plan will be compiled during the summer and the draft plan submitted for ANSTF review next fall. Kendrot thought that the timeline might be overly ambitious.

Heimowitz shared activities being conducted on the Pacific Northwest front of the “war on nutria.” These activities include a regional workshop in April 2007 attended by nearly 100 participants, development of a distribution map and regional management plan, research on nutria impacts to restoration project sites, and ongoing opportunistic control programs. Heimowitz added that these efforts were largely supported by a partnership between Portland State University, the USGS, and the USFWS.

### **State Management Plans**

Participants heard presentations for three SMPs that were being provided for approval or conditional approval. Following the presentations, the ANSTF talked about the process for developing SMPs and allocation of funds.

#### ***Idaho***

Amy Ferriter, Idaho Department of Agriculture, participated via conference call to request that the ANSTF approve the Idaho SMP. This plan had been signed by Governor Otter. According to Ferriter, Eurasian watermilfoil is the biggest problem so far, and the state has a large control program for this invasive. However, others such as water hyacinth are of concern as well.

Global warming aside, Idaho has considerable geothermal resources, many of which are important for aquaculture. The state is concerned that these geothermal resources could support tropical ANS such as Brazilian elodea, water hyacinth, and hydrilla. So these species are included although they wouldn't typically be seen as a threat in this area.

She displayed a map of quagga mussel monitoring sites throughout the state. In addition, the Invasive Species Council plans to conduct veliger and substrate sampling to ensure that a good network is in

place should quagga mussels be found. A communication plan is also in development. Following the presentation, the ANSTF approved the Idaho ANS plan.

### ***Rhode Island***

As the Northeast Aquatic Nuisance Species Regional Panel co-chair, Kevin Cute, Coastal Resources Management Council, introduced the Rhode Island SMP. In the region, one interstate and four state ANS management plans have been approved. Comments received from a variety of sources were incorporated into the plan, and the document has been finalized. Rhode Island has 21 nonnative marine and 42 nonnative freshwater species. Cute highlighted some of the invasive species in Rhode Island and management activities conducted by the Coastal Resources Management Council and Department of Environmental Management. The SMP has three broad goals elaborated through seven objectives. It also includes an implementation table that identifies 37 specific tasks needed to implement the goals and objectives and proposes three initial activities. The plan will help Rhode Island establish an AIS program, designate lead state agencies, and create partnerships.

Participants noted that, although Rhode Island may be a “newcomer” to developing an SMP, the state has learned well from other states and put together an impressive plan. Following discussion, the ANSTF conditionally approved the plan, pending Governor Carcieri’s signature.

### ***California***

The *California Aquatic Invasive Species Management Plan* (CAISMP) is considered one of the most comprehensive state plans. The University of California in Davis submitted the original draft in August 2006, following three public workshops and three public hearings. Karen McDowell, San Francisco Estuary Project, reviewed the goals and objectives of the plan, including the importance of coordination among state agencies.

The CAISMP has several unique appendices, including a table of funding estimates for participating state agencies, a list of species regulated in California, and a draft rapid response program. The state plan also highlights near-term high-priority actions for years one and two that are not yet being addressed by a state agency, and it identifies several vectors.

The CAISMP establishes the California Agencies Aquatic Invasive Species Team (CAAIST), which includes representatives from each state agency involved with AIS. The CAAIST will hold regularly scheduled meetings and consult with stakeholders and academia through a series of panels.

Lead agencies will evaluate the progress of the plan, and the California Department of Fish and Game will compile annual updates. The plan is adaptable, and appropriate alterations will be made as needed following evaluations by a plan implementation panel after years one, two, and five.

Although people were pleased to see a draft rapid response program as part of the plan, some were concerned that the plan may not be used since actions are already being implemented. McDowell clarified that funding estimates include state funds as well as Sea Grant funds. In addition, the quagga mussel incident created a significant increase in funding. Following discussion, the ANSTF conditionally approved the CAISMP, pending Governor Schwarzenegger’s signature.

### ***SMP Guidelines and Allocation of Funds***

Executive Secretary Newsham requested comments on the current process and guidelines for developing SMPs, as well as on the allocation of funds among the states and interstate groups with approved ANS management plans. At the spring 2007 meeting, he had asked the regional panels to consider the usefulness of existing SMP guidelines, means for improving interstate/regional cooperation, and alternative SMP funding approaches. The general consensus was that the process requires improvement. Newsham agreed to draft new guidelines based on his involvement with the

process and people's input. Karen McDowell, San Francisco Estuary Project, volunteered to help. ANSTF members provided the following suggestions to be considered in the revision:

- Clarify how the ANSTF deals with comprehensive plans (plans addressing both terrestrial and aquatic species).
- Simplify the guidelines and resulting SMPs.
- Provide more guidance on the plan evaluation/approval process.
- Emphasize existing resources for states to draw on (Habitattitude, Stop Aquatic Hitchhikers, regional panels, and others).
- Provide information about federal authorities.

The ANSTF recommended continuing the current allocation strategy of equal funding (each plan receives an equal portion of the available funds). One alternative for future consideration was an equal allocation up to a predetermined level, with funds above that amount being allocated on yet-to-be-determined criteria.

Members encouraged states to nurture other sources of funding as well. To address accountability, they agreed that accomplishments should be recognized—through an annual report and other communications. Such action may help increase federal funding.

Co-chair Wilson indicated that, while the USFWS requested \$1.075 million for fiscal year 2008 support of management plans, the final figure could be less, but this would not be known until fiscal year 2008 appropriations are received.

Newsham posed the question of whether states should still be eligible for funding if they haven't updated their plans at least once every five years, as is suggested in the current guidelines. To make plan updating more manageable given resource constraints, McDowell suggested requiring periodic updating of the implementation tables. No decision was made.

## November 8 Welcome and Ballast Water Updates

Co-chair Everett Wilson welcomed participants and reviewed the agenda. As Marilyn Katz had to leave the meeting early to fly to the West Coast, no USEPA update on ballast water was provided. Karen McDowell, San Francisco Estuary Project, updated the ANSTF on major initiatives of the California Marine Invasive Species Program.

### *U.S. Coast Guard*

Commander Vickie Huyck, USCG, provided an update on ballast water initiatives. Regulation for ballast water discharge would set a concentration-based standard; be used to approve ballast water treatment technologies; be environmentally protective, scientifically sound, and enforceable; and address a full range of organisms. Executive Order 12866 requires a cost-benefit analysis. This analysis, now complete, is part of the draft programmatic environmental impact statement (DPEIS). A workshop, composed of experts in the National Environmental Policy Act and biologists from the five cooperating agencies, was convened to complete the DPEIS analysis and obtain interagency team agreement. The USCG incorporated comments and completed the DPEIS, which began USCG clearance two weeks ago. The DPEIS should be published this winter. The USCG has shifted focus to completing and publishing the notice of proposed rulemaking, which will soon be available for public review. The USCG will host several public meetings.

Ballast water technologies must meet the discharge standard and a number of engineering and operational requirements. Any treatment system has to go through rigorous testing, which requires development of standard test protocols. To develop protocols, the USCG is using the USEPA

Environmental Technology Verification Program, which includes a technical panel of experts from several disciplines. These system test protocols for ballast water technologies are being developed at the Naval Research Lab in Key West, FL.

The Shipboard Technology & Evaluation Program is currently evaluating four applications. The USCG will file a request for more applications in the Federal Register. The USCG has been busy at the IMO, which has adopted 14 of 15 sets of guidelines introduced by the Ballast Water Management Convention of 2004. To date, 10 nations have ratified the Ballast Water Management Convention. The Convention would phase out ballast water exchange and set discharge standards. Biofouling management was introduced as a new work item at the 56th meeting of the Marine Environment Protection Committee. Biofouling will be a new work item at the next international ballast water meeting at the IMO Bulk Liquid and Gases Subcommittee Meeting in February 2008.

All ballast water systems have to be approved by the IMO, so when setting domestic regulations, the USCG tries to align them with the IMO standard. But the United States wants flexibility to adopt more stringent standards if the international standard isn't sufficiently protective. Participants asked whether approval under the Shipboard Technology & Evaluation Program could be faster. Huyck responded that the program is constrained by resources and required to follow the National Environmental Policy Act process, which takes time.

#### ***National Oceanic and Atmospheric Administration***

In the past, Dean Wilkinson, NOAA, has reported on a number of individual research projects sponsored by NOAA and the USFWS. Today, Wilkinson reported on the NOAA-sponsored ballast water program. The Key West testing facility has been identified as a priority, but other facilities are needed on other coasts. Rather than sponsoring basic research on technologies, NOAA has sponsored two additional research facilities, one in Superior, WI, and a second in Sequim, WA.

Wilkinson directed participants to two reports posted by the Great Lakes Environmental Research Laboratory. The research lab has looked at the issue of treating vessels when they operate with no ballast on board (called NOBOBs). The lab is looking for treatment options since organisms can reside in the residual water and sediment that cannot be pumped from the ballast tanks. Researchers have discovered that a saline flush destroys more of the organisms, even during the resting stages (eggs and cysts). A saline flush does not guarantee removal of all organisms, but it substantially reduces the risk. Canada has developed regulations that require ships coming into Canadian ports to complete a saline flush. In addition, they have conducted experiments involving addition of rock salt to raise salinity levels. This year, the method was tested on two vessels entering the Port of Montreal. Participants mentioned that the USCG did distribute best management practices and is also studying the issue.

Together with the Smithsonian Environmental Research Center, the research lab completed a study of the efficacy of ballast water exchange. The lab has concluded that exchange can substantially reduce risks associated with ballast water: Findings indicate that exchange resulted in the removal of a minimum of 85% of organisms when guidelines were followed carefully.

#### ***California State Lands Commission***

Karen McDowell, San Francisco Estuary Project, reported on two major initiatives of the California Marine Invasive Species Program. This program was established to prevent introductions of nonindigenous invasive species to California through ballast water under the California Ballast Water Management for Control of Nonindigenous Species Act of 1999. Reauthorization as the Marine Invasive Species Act in 2003 expanded the program to include coastwise traffic. Vessels are charged \$200 to \$600, and these fees fund the entire program. The reauthorization also requires the CSLC to work on vessel fouling and performance standards for ballast water technologies.

Recommendations for performance standards were published in January 2006, followed by the evaluation of vessel-fouling risk and associated recommendations in April 2006. This October, Assembly Bill 740 passed, which gave the CSLC authority to address commercial vessel fouling by targeting high-risk vessels and collecting data to fill key information gaps. These data will be used to develop future regulations.

To address performance standards, a technical advisory group has been working closely with USCG headquarters. Performance standards, which are more stringent than those from the IMO, were approved by the CSLC in 2006. In September 2006, the Coastal Ecosystems Protect Act was passed. This act adopted the standards and timeline approved in 2006. A report evaluation of ballast water treatment technologies is now in draft form and due in 2009.

On a final note, McDowell provided an update on the U.S. Maritime Administration's ship recycling program. State and federal legislative staff have been working with the U.S. Maritime Administration regarding concerns about the lack of controls to capture heavy metal pollution during the process of cleaning retired ships. Local environmental groups have begun adding pressure as well.

### **Smithsonian Environmental Research Center**

Jennifer Boehme, Smithsonian Environmental Research Center, reported on research that she and Greg Ruiz, also of the Smithsonian Environmental Research Center, have been conducting for two years on verifying ballast water exchange with chemical tracers. The goal of ballast water exchange is to reduce the transport of invasive species by exchanging water in the open ocean where the species are unlikely to survive. Ballast water exchange has traditionally been verified using salinity, which is neither uniformly applicable nor always definitive. Chemical tracers provide a supplement to salinity measurements. In the past, researchers have found barium, phosphorus, and manganese to be effective tracers. Another possible tracer is dissolved organic matter, which can be observed by measuring the fluorescence of seawater. The Smithsonian Environmental Research Center has characterized port variability and compared tracer distribution with offshore transect data.

Data for the port of Los Angeles were presented, showing a twofold shift in dissolved organic matter concentration across the port, with highest concentrations observed near the outflow of the Dominguez Canal. Seasonal variations for tracers in the port were also roughly a factor of two. The next step was to examine tracer variability in offshore environments up to 80 nautical miles. Although organic matter significantly decreased offshore for all seasons, other chemical tracers were less useful due to concentration similarities between ports and offshore environments for some seasons. Boehme examined transects to discover geographic distribution of dissolved organic matter and trace elements as well as to answer the question of potential thresholds for chemical tracers. Dissolved organic matter is useful for differentiating nearshore and offshore environments and exhibits north to south concentration shifts, with higher relative nearshore concentrations observed in northern California and the Pacific Northwest. Key chemical tracers differ significantly between port water and distances greater than 50 nautical miles offshore.

The USCG has been developing a handheld device (BEAM) to measure dissolved organic matter fluorescence. The handheld device should be ready for field testing soon and could be streamlined for production.

### **Quagga Mussel Rapid Response and Lessons Learned**

A panel of individuals from the Colorado River Basin spoke about their experiences with rapid response for quagga mussels in Lakes Mead, Mohave, Havasu, and surrounding areas in Arizona, Nevada, and California. This panel consisted of Larry Riley, Arizona Game and Fish Department; Jeff Herod, USFWS (with California and Nevada Operations at the time of response); Gary Johnston, National Park Service; and Denise Walther, USFWS. Tina Proctor, USFWS, moderated the panel.

When asked what the lessons learned were, Riley discussed the detection of quagga mussels in Lake Mead on January 6, 2007. Underpinning the response was the 100th Meridian Initiative. Much of the information, advice, and expertise they needed was already in place thanks to this partnership, especially communication networks. Riley elaborated on other communication networks that worked also. Existing communication and partnership networks—such as those in place for the Lower Colorado River Multi-Species Conservation Program, Glen Canyon Adaptive Management Program, and in-state cooperative efforts among wildlife and water resources agencies—served as immediate pathways for information exchange. He advised those working on rapid response plans to identify existing communication networks and develop others to fill the gaps. The Columbia River Team (of the 100th Meridian Initiative) had a rapid response plan nearly completed, and those in the Colorado River system planned to use that plan as a model for development of a Colorado River Basin plan this calendar year. Unfortunately, they were too late!

Riley also thanked the National Park Service for its leadership. The agency immediately mobilized the modified incident command system, which provided a framework for considering and coordinating leadership, logistics, inventory (determining the extent of the issue), outreach, science input, and more. Lake Mead National Recreation Area was able to redirect existing funding from the Nevada Public Lands Act to lead financing of response efforts and mobilize divers, a resource that was sorely needed but lacking from other cooperators. One area of the invasion—with Lakes Mead and Mojave—is under National Park Service authority. But Lake Havasu lies on the Arizona–California border outside National Park Service authority. The state of California mobilized its own internal incident command system structure but strove to maintain coordination with Arizona, Nevada, and the efforts at Lake Mead National Recreation Area. Other panelists reiterated the importance of collaboration among the entities involved and the communication networks in place.

Herod shared his experiences at the technical level. The peer-to-peer training that occurred was very important. Although he thought the process worked well, he wondered how or whether the mussels could have been detected earlier. Karen McDowell, San Francisco Estuary Project, commented that the state of California immediately declared an emergency and mobilized just under \$1.5 million for border checkpoints and other needs (including dive surveys in Lake Havasu and throughout affected water distribution systems in California). Walther provided numbers from the checkpoints. All stations are staffed round the clock. From January to late October, over 10% of the boats coming through had water to drain, and more than 80 had to be quarantined. Riley added that the contingency funds provided by the state of California and through a state of Nevada grant to the National Park Service were crucial. Without contingency funds of some kind, they may not have been able to respond as quickly as they did.

Panelists also discussed why the quagga mussel was missed for so long and what might have been done differently if it were known earlier that quagga mussels had invaded the lower Colorado River system. Riley thought that the quagga mussel slipped by when people were focused on zebra mussels. Substrate monitoring was concentrated in shallower water, which is more typical of the zebra mussel. Quagga mussels prefer deeper substrates. He added that veliger monitoring was more difficult, but it might be more effective than substrate monitoring. Once found, steps would likely have been the same as those taken, and eradication would still be unlikely.

Herod valued the opportunity to assess “tools in the toolbox” and the processes for early detection/rapid response. He believes we need to continue pushing for better tools, especially for eradication in large, open systems. He wondered how to respond beyond monitoring and alerting people. The 100th Meridian Initiative has a large database of boat movement, which can help agencies prioritize their resources. It was suggested that the ANSTF figure out ways to advance detection efforts and development of feasible tools for control and eradication. The ANSTF should deal with the big species

with big environmental and economic impacts rather than “nibbling around the edges of less damaging species.”

Participants discussed some of the biological and ecological differences between zebra and quagga mussels, including limiting factors. They also talked about how the mussels may not have been eradicated, but the rapid response affected the risk of secondary spread.

### **Lower Columbia River Basin Rapid Response Exercise**

According to Paul Heimowitz, USFWS, the Columbia Basin Team started developing a rapid response plan for zebra mussels four years ago with funds from the Western Regional Panel. An initial working draft plan was completed shortly before quagga mussels were found in the Southwest. Two weeks ago, a number of stakeholders participated in a tabletop exercise to determine whether the plan would work and what gaps needed to be filled or sections refined. The Pacific States Marine Fisheries Commission hired a contractor, who has led similar exercises, to organize and facilitate the event. Heimowitz reviewed the scenario for the exercise. A small-scale infestation of quagga mussels are discovered attached to a boat and an adjacent boat ramp (the boat arrived at the site a couple of weeks prior). To add interest and urgency, the hypothetical mussels are found just upstream of Bonneville Dam. The exercise included several “injections” regarding fiscal and public relations/ media issues. There was not as much focus on the tactical side; the primary goal was to clarify the funding roles and responsibilities of agencies.

Participants came away with a number of revisions and improvements for readiness. They agreed to the basic incident command system outlined in the current draft plan and were unanimous in wanting to continue building communication networks and holding additional exercises. Stephen Phillips, Pacific States Marine Fisheries Commission, added that the next draft of plan would be available in a couple of months. The hope then is to develop a memorandum of understanding or other form of agreement that commits agencies to using the plan and enhancing their own preparedness. ANSTF members asked about legal foundations, enforcement, and private property issues. Heimowitz invited anyone interested in observing the next exercise to let him or Phillips know.

### **Closing Business and Adjournment**

Co-chair Wilson announced that Scott Newsham would be resigning his position to devote his time to local educational issues as a member of the Alexandria City School Board; this was Newsham’s last meeting as executive secretary. He thanked Newsham for making the ANSTF a more effective organization during his two and a half years in the position. Wilson would also not be at the next meeting as he is retiring, although he will continue to be involved in ANS issues. Newsham reviewed decisions and action items with participants.

The next meeting is scheduled for the week of April 28 in the Southeast. David Rice, Gulf States Marine Fisheries Commission, will work with the executive secretary to identify the location. Potential agenda items include agency work on aquatic pathogens, the new marine ornamentals working group of the Gulf and South Atlantic Regional Panel, industry engagement in ANS, and the content of any new legislation that has passed. The meeting was adjourned at approximately 11:30 AM.

## ACRONYM LIST

AIS	aquatic invasive species	NOAA	National Oceanic and Atmospheric Administration
ANS	aquatic nuisance species		
ANSTF	Aquatic Nuisance Species Task Force	SMP	state or interstate management plan
		USCG	U.S. Coast Guard
APHIS	Animal and Plant Health Inspection Service	USEPA	U.S. Environmental Protection Agency
CSLC	California State Lands Commission	USFWS	U.S. Fish and Wildlife Service
DPEIS	draft programmatic environmental impact statement	USGS	U.S. Geological Survey
		VHS	viral hemorrhagic septicemia
IMO	International Maritime Organization		

## SPECIES LIST

bighead carp	<i>Hypophthalmichthys nobilis</i>
black carp	<i>Mylopharyngodon piceus</i>
Brazilian elodea	<i>Egeria densa</i>
burmese python	<i>Python molurus</i>
cane toad	<i>Bufo marinus</i>
Chinese mitten crab	<i>Eriocheir sinensis</i>
common carp	<i>Cyprinus carpio</i>
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>
European green crab	<i>Carcinus maenas</i>
grass carp	<i>Ctenopharyngodon idella</i>
hydrilla	<i>Hydrilla verticillata</i>
nutria	<i>Myocaster coypus</i>
New Zealand mudsnail	<i>Potamopyrgus antipodarum</i>
purple loosestrife	<i>Lythrum salicaria</i>
quagga mussel	<i>Dreissena rostriformis bugensis</i>
salmon	<i>Oncorhynchus tshawytscha</i>
saltcedar (tamarisk)	<i>Tamarix ramosissima</i>
silver carp	<i>Hypophthalmichthys molitrix</i>
water hyacinth	<i>Eichhornia crassipes</i>
whirling disease	infection caused by <i>Myxobolus cerebralis</i>
zebra mussel	<i>Dreissena polymorpha</i>