Western Regional Panel/Mississippi River Basin Panel (MRBP)
on Aquatic Nuisance Species (ANS)
Joint Meeting

Wichita, KS

September 7-9, 2005

Assignments/Action Items Summary

Risk Assessment Workshop - Plan and convene a Risk Assessment Workshop.

Saltcedar - Determine if an adequate website exists on saltcedar, and develop a website if needed.

100th Meridian Boater Survey - Extend 100th Meridian boater survey to states east of the meridian.

Classroom Programs - Develop a policy on classroom programs including live release of organisms, how *Habitattitude*^{TM} might be integrated, and submit policy to the ANSTF.

Coast Guard Auxiliary - Brief them, as invited, and provide packages of outreach materials.

Stock Recruitment Models - Develop list of species of common concern, and provide expertise to develop models.

Injurious Species Listing - Develop and maintain lists of state-regulated species, add to Panel websites, and provide data and recommendations to the USFWS that will assist in injurious wildlife listings.

Interpanel Communications - Panel EXCOMs should communicate on activities, issues, and species of common concern.

Aquatic Animal Species Control - Develop a more organized effort on how to control aquatic animal species, including development of a control symposium/workshop.

AIS Control Database - Review what is being done, where, how and by whom.

Experts Database - Integrate with USGS data base on species.

Global warming - A risk assessment may be needed.

Survey Needs on Shared Waters - Coordinate baseline (ecological) survey needs on shared waters.

Tribal Involvement - Improve tribal involvement by developing a model for panel use.

Shared Resource Priorities - Coordinate on research priorities for shared waters.

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DRAFT Minutes

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WRP Coordinator Tina Proctor opened the meeting at 8:00 a.m. with a few welcoming remarks and housekeeping notes. She noted that Jerry Rasmussen, MRBP Coordinator would be keeping the minutes, and that Jay Rendall, MRBP Chairman, and Susan Ellis, WRP Chairman, would be running the meeting. She then turned the meeting over to Jay Rendall.

Rendall (MN) also made a few welcoming remarked and thanked every for attending. He noted that a lot of work had gone into planning for the meeting, and he thanked Proctor and Rasmussen for setting up everything and Tom Mosher (KS) and Jason Goeckler (KS) for handling local arrangements. He said one of the primary goals of the meeting is to provide the opportunity to learn more about ANS issues in the Basin, to meet one another, and to begin developing joint projects. He said there is great value in sharing information. He said that all of the panels are relatively new entities, and that we are plotting a new course as we move along. He said that we have been given no specific directions on operations, so we all have approached things differently, and therefore we can learn from one another. Also, he said, as we continue to work on ANS issues, he gets concerned about where we're headed down this slippery slope, so he encouraged each of the speakers to inspire us to move ahead on these issues. Finally, he said, I look forward to meeting all of you. He noted that a "sign up" sheet would be circulating throughout the room to provide anyone who is not a formal panel member the opportunity to speak later in the meeting.

Proctor then asked Keith Sexson, Assistant Secretary for Kansas Wildlife and Parks (KWP), to make some remarks. Sexson said that given the events of the last week or so (Hurricane Katrina), "I'll guarantee you that I'd rather be in a Kansas tornado than in a hurricane and flooding as in New Orleans, so I come to appreciate what we have here in Kansas more and more each day. He then extended a big heartland welcome to everyone, and noted that his Department was very pleased to be hosting the conference. He said that the KWP is celebrating its hundredth year anniversary this year, and that it all started at Pratt at a fish hatchery, and that facility is still there today. He noted that the Secretary's office resides in Topeka, but the rest of us are still there in Pratt. He said that when he thinks back over the last 36 years that he has been with the KWP, it boggles the mind at the issues we face today and our funding and staff are stable. He said we must acknowledge the impacts that ANS have on wildlife and agriculture. He noted that the coordination and leadership role of the Aquatic Nuisance Species Task Force (ANSTF) and panels are critical in our efforts to stop the spread of these species. He said that zebra mussels in Eldorado Lake are contributing to the contamination of downstream lakes, and that white perch have impacted native species. He said that purple loosestrife and carp species are also issues in Kansas. He also said that Kansas just had a New Zealand mudsnail scare a week or so ago with a shipment of rainbow trout. He said that the ANSTF and the regional panels must be supported to help keep these far reaching issues form falling through the cracks. He said that the Missouri, Kansas and Arkansas rivers are his state's three navigable rivers, and that these are the only rivers in the state that have good public access. He noted that there is some development in downtown Wichita, and the city has come to recognize the Arkansas River as an asset rather than a liability, and that there is a great deal of interest now in providing boating access. He said that we hope that attention drawn to it in this way will lead to its preservation and management for the future. He said that the non-navigable rivers in the state are all restricted by private ownership and there is no public access. He then reiterated his welcome to Kansas and thanked the group for holding the meeting in Wichita.

Proctor then briefly mentioned all those people who helped put the meeting together, and wished to especially thank Doug Nygren (KS and MICRA) for his support on ANS issues. She then asked that everyone in attendance introduce themselves and state their interest in ANS and ANS issues.

After introductions Proctor noted that we have a lot to learn from each other, and said that the next session would provide a brief discussion of ways in which the two panels can work together. She then asked Mike Hoff (Vice Chairman and USFWS) to make some remarks with relation to that subject.

Hoff said that we need to focus on ways in which we can work together and perhaps with other entities. We want to ask you to listen to the presentations over the next two days, and as you see ideas for joint needs, opportunities, and projects to let us know. He said that tomorrow at 3:45 p.m. we'd like to discuss your ideas - issues of common concern. He then asked Rendall and Ellis to discuss activities of their respective panels and to provide any views they may have on joint projects.

Ellis said that the WRP is one of the older panels. She said that panel membership includes 17 state members, tribes, Canada, Mexico, and many federal members. She said that the WRP meets once a year, and that they have a monthly conference call with a 9 member executive panel. She said that the WRP has a series of projects that are worked on each year - state plans, state funding, political issues, etc. She also noted that the panel has used some of its funding for a US/Canada cooperative project to eliminate *Spartinia spp.* She said that ANS materials are distributed at US/Canada border crossings, and that the panel has given funding to various meetings and groups (i.e. North American Lake Management Society, Desert Fishes Council, etc.). She said that the panel has also developed an educational materials catalog at Portland State University, expended funding on pre-invasion response efforts, partially funded the Kansas ANS plan, and used part of its funding for travel expenses. She said one purpose of this meeting is for us to look to ways in which we can avoid duplication of efforts and share expenses for project which we have in common. She said that she would be listening to the presentations over the next couple of days and that everyone will be asked to bring forward such ideas for tomorrow's session.

Jay Rendall outlined the following points regarding MRBP activities in a Power Point Presentation:

<u>MRBP Member Participation at ANS Events</u>

- WRP meeting - Tom Mosher (KS) attended and reported
- Gulf States Panel meeting - Doug Nygren (MICRA) attended
- Great Lakes Panel meeting - Mike Hoff (USFWS) attended
- Midwest ANS Workshop - Jay Rendall (MN) and Jerry Rasmussen (MICRA/MRBP) attended
- ANSTF Research Committee meeting - Cindy Kolar (USGS) attended
- Risk Assessment Workshop - Cindy Kolar and Jerry Rasmussen attended

<u>MRBP Priority concern</u>

- Asian carp impacts and spread

<u>National Issues of Interest to MRBP Members</u>

- National Asian carp regulations
- National Asian carp plan
- NAISA (NISA reauthorization) S. 770
- Other national ballast bills S. 363

<u>MRBP Progress and Direction</u>

- The Prevention, Risk Assessment and Research, and Information and Education Committees are

working on their responsibilities and work plans.
- A position statement on barriers and fish passage was developed and is posted on the MRBP Web site.
- A Field Guide to Aquatic Invasive Species in Mississippi River and Great Lakes basins is being developed.
- The Panel held a risk assessment workshop with the Gulf Panel and is planning another such workshop this winter.
- MRBP research priorities will be determined and sent to NOAA for the next RFP.

MRBP Recommendations
- The Panel made a recommendation for dispersal barriers to prevent the spread of aquatic invasive species.

Field Guide to Aquatic Invasive Species being developed

- Content: 16 full page profiles & 24 short profiles
- Length: 28 pages
- Completion: Fall 2005

He then noted that the MRBP would be electing new officers over the next few months, and he shared Ellis' interest in looking for ways in which the WRP and MRPB could work together.

Proctor then introduced Thomas Flowers, U.S. Department of Agriculture, National Resource Conservation Service in Meade, KS to discuss concerns regarding the salt cedar invasion. Flowers made the following points in a Power Point Presentation entitled, **Brush Management**:

Phreatophytic Brush Share the Following Attributes
- High water consumption
- Usually occurs on sub-irrigated sites
- Problem species are non-native

Problem Species Include:
- Salt Cedar or Tamarisk
- Russian Olive

History of Introduction of Salt Cedar
- Introduced to United States before 1823
- Known in Meade County, KS by 1910

Distribution of Salt Cedar
- Primarily a Southwestern species
- Localized but widespread in Kansas

Salt Cedar Attributes
- Extremely Invasive
- In Meade County the infested area doubled from 1981 to 1991 (7,200 Acres infested in 1991)
- Infested area doubled again from 1991-2001
- Water Use: Each plant uses 200 - 500 Gallons per day, equal to 5.5 Acre Feet per acre per year (Corn uses about 2 acre feet)

- A single tree produces 1,000,000 plus Seeds annually

Control Methods

- Chemical
  - *Remedy*: Plants defoliate within 14 days, then re-leaf twice and defoliate, and then look sick the second year. Plants can regenerate by basal and root sprout; but canopy is opened up, grass is released, fire is now possible, and grazing is improved. Before treatment production is about 500# of grass/acre, afterwards production is about 3000#/acre. Problems include: "shadowing" due to low volumes, and it is difficult to avoid desirable plants. Therefore the more precise the application, the more desirable the results.
  - *Arsenal*: *Arsenal* is an ALS inhibitor acting as a soil sterilant for 10 or more years (i.e. nothing grows). Cost ranges from $85-100/acre, plus the cost of revegetation and the loss of grazing. Costs can be reduced to $25-30/acre ($5/tree) by killing individual plants using basal bark treatment. Stumps can be cut and then sprayed. Cut brush can then be piled and burned (cost is about $1-2/tree).
  - Phenoxys: Phenoxys are probably not legal due to environmental concerns, especially if critical habitat is involved.
- Mechanical
  - Mow: Mowing salt cedar is hard on equipment and expensive. A hydro axe can be used, but it is a large piece of machinery which costs about $180,000 to purchase or about $100.00/hr to rent. It cuts about 6 Acres/hr at a cost of about $18/Acre. Also the cut brush will re-sprout from pieces as small as one quarter inch in size. Cut pieces are also sharp, hard on rubber tires, and they cause possible hoof problems for cattle. This technology is presently being evaluated in combination with spraying or burning.
  - Chain: Chaining requires special equipment, and causes severe damage to all vegetation and the landscape. Also every piece of salt cedar can resprout, and chained areas require re-vegetation.
  - Plow: Plowing also requires special equipment, and costs range as high as $1,000/acre.
- Cultural
  - Fire: Fire is a useful, inexpensive tool. But salt cedar goes up like a roman candle, it just explodes, so safety and spread of wildfire is a concern.
  - Goats: Use of goats as a grazing tool has shown promise. Cost is estimated at $273.00/Acres/ year and three treatments are suggested. Initial stocking rates is 18 goats/acre for 30 days or 1 adult/.17 acre unit.
  - Insects: Insects showing promise for salt cedar control include the saltcedar leaf beetle (*Diorhabda elongata*) and the Manna scale (*Trabutina mannipara*). The saltcedar leaf beetle was approved for release in field cages in 1999 for eight sites in 6 different states (CA, NV, CO, UT, WY, TX). This release occurred in 2000. The saltcedar leaf beetle was released in Kansas in 2005. The Manna scale is still under quarantine. The problem with Manna scale is it is very slow to act and control is less the 100%.

Flowers said that not everyone in Kansas is on the same page with salt cedar. He said that it is poor habitat for deer, but it is better than no habitat, and that it is also used for elk habitat, so some hunters like it. Flowers responded to the following questions:
- Where salt cedar has been removed has stream flow measures been taken? Flowers said we've not been able to totally remove any stands of salt cedar. We have stream flow gauges and water table studies underway, but we're doing such small scale projects, that no effect has been shown.
- Have different strains of *Diorhabda* beetle been used? Flowers said we don't know how many species of salt cedar we have in KS, or if the parasite is species specific, so we may have the wrong one, we're not sure.

- Are there any trees available to replace salt cedar in the interest of hunter's needs? Flowers said Kansas is located in a high plains grasslands prairie, and there was only one tree per county in the 1800's, so any time we have trees we displace one group of wildlife for another. Salt cedar has been very little used by birds - a few mourning doves, blue cockoos and grosbeaks. Nothing uses the middle of a stand.
- How much profit comes from the use of goats? Flowers said we did not factor the profits made from goats into our cost estimates, so our costs are probably a little high for what we're doing.

Proctor then introduced Robert Leavitt, California Department of Food and Agriculture (CDFA) to speak on *Salvinia* and South American spongeplant problems in California. Leavitt said his agency does a lot of work on very small pieces of land. He said that *Salvinia* stops all flow of O_2 and light, kills all other vegetation and provides poor habitat for fish. He said it grows in mats up to several feet thick, and one problem was that Martha Stewart had recommended *Salvinia* as a beautiful house plant. He said it only reproduces by vegetative reproduction, producing no seeds. He said that the South American spongeplant, also called little water hyacinth, grows in big thick mats. He said it can be cut with a machete into squares and stacked like bricks. He said it produces impacts similar to *Salvinia*, but will actually kill all the fish. He said that all infestations in California are within several miles of each other. Leavitt then made the following points in a Power Point Presentation, entitled, **Eradication of Giant Salvinia and South American Spongeplant from California**:

Strategy

- To eradicate small, pioneer infestations before they can become large, established infestations (i,.e. "Early Detection, Rapid Response").

Giant Salvinia - *Salvinia molesta* complex Overview

- Federal aquatic noxious weed
- California A-rated noxious weed
- So far found only in isolated areas in inland ponds and rivers
- California Department of Food and Agriculture (CDFA) is cooperating with the Lower Colorado River Giant Salvinia Task Force along the lower Colorado River
- Good public cooperation

Possible Pathways of Giant Salvinia Introduction

- Commercial waterdogs and bait fish importations from out-of-state (waterdogs now prohibited in California)
- Retail aquariums, aqua garden trade, and pet stores; Survey conducted in 1999
- Recreational: camping, fishing

Giant Salvinia - Mendocino County Infestation

- Site Description
  - Small homeowner pond, about 800 square feet
  - Drains into Pacific Ocean about ¼ mile away
  - Homeowner reported he had been hand removing giant salvinia for at least 7 years using net
  - Referral to County Ag Commissioner- homeowner tired of hand removal
- Timeline
  - First surveyed by CDFA in spring 2004
  - Treatment
    - Hand removal using kayak; cleaned brush and debris
    - Fluridone slow release pellets at 45 ppb, 2 applications
    - Diquat and glyphosate spray, 3 applications
  - No giant salvinia since winter 2005; surveys to continue for several years

Giant Salvinia - San Luis Obispo County Infestation

- Site Description
  - 0.75 acre fire control pond at oil well site
  - 18 feet deep at deepest
  - 100% coverage when found
  - Referral from County Ag Commissioner was interfering with fishing
- Timeline
  - Found in Fall, 2001
  - Treated with 90 ppb fluridone (Spring 2001, 2002, 2003)
  - Survey only 2004, 2005
  - No plants found since 2002

Giant Salvinia - Riverside/Imperial Counties Infestation

- CDFA cooperating with the Lower Colorado River Giant Salvinia Task Force Task Force (Co-lead by USFWS and USBOR)
- Giant salvinia beetle (*Cyrtobagous salviniae*) released in Outfall Drain and along the lower Colorado River by USDA/APHIS with promising results

South American Spongeplant – *Limnobium laevigatum* Overview

- Eradication and Quarantine Authority
- A-rated noxious, aquatic weed
- Emergency regulations, OAL
- Proclamation of Emergency Project
- County quarantine

Possible Pathways of South American Spongeplant Introduction

- Retail or amateur aquariums, aqua garden

Sites

- 7 acre residential pond in Shasta County
- 1/10 acre pond in Shasta County
- Plastic tubs in a Shasta County nursery

Main Infestation - Site Description

- 7 acre residential pond, surrounded by 40 houses
- Once used for boating and fishing
- 5 acres infested with 100% cover
- Pond connected by canal to Sacramento River
- T&E Species - Chinook salmon, winter-run, spawning ground

Early Detection, Rapid Response

- Treatment protocols
- Pond isolated with sandbag dam
- Screening of outlet
- Hand removal
- Glyphosate and diquat, 2 oz + 0.6 oz / gallon

Pre-counts

- Three 50 meter transects with 5 quadrats each
- Average of 830 plants per quarter meter squared

Conclusion

- 'Early Detection, Rapid Response' is key to successful eradication

Leavitt responded to the following question:
- What is the species range? Leavitt said he believed the range was tropical/sub tropical, but no one really knows.

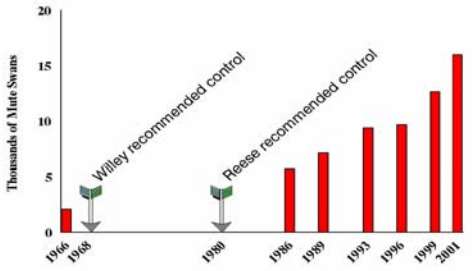
Proctor then introduced Scott Petri, Bird Studies Canada, to make a presentation on mute swans. Petri said that aquatic nuisance species are impacting waterfowl and wetlands more than anything else. He then made the following points in a Power Point Presentation entitled, **Rapid increase in the lower Great Lakes Population of feral Mute Swans: A review and a recommendation**:

Overview

- The accidental and intentional introduction of exotic waterfowl can have negative ecological impacts on native species (Weller 1969).
- Adverse effects are particularly likely if the introduced species is aggressive, competes with other waterfowl for food or habitat and/or hybridizes with native species.
  - Ruddy ducks introduced into Europe
  - Canada geese introduced into the United Kingdom
  - Mute swans introduced into the United States

Mute Swan Problems

- Displace native waterfowl from breeding, wintering and staging habitats = reduced carrying capacity of wetlands.
- They reportedly kill numerous native species of waterbirds.
- They consume and uproot large quantities of aquatic vegetation, thereby competing with native species for food.
- Unlike Tundra Swans, they do not field-feed and they are non-migratory.
- Recent reports of hybridization with Trumpeter Swans



Number of Mute Swans counted in the US portion of the Atlantic Flyway during the Mid-summer Mute Swan Survey.

Population and distribution of feral Mute Swans on the Great Lakes

- Michigan - 4224
- New York - 2000
- Pennsylvania - 250
- Ohio - 150
- Ontario - 2000
- Wisconsin - 582

How big might the lower Great Lakes problem get?

- What is the present rate of population growth?
  - Mid Winter counts on Lake Ontario show an annual growth rate of 10% and 1990s growth rate

of 16%.
- Christmas bird counts on Lake Ontario show an annual growth rate of 15%.
- Christmas bird counts in the U.S. show an annual growth rate of 21%.
- Peak Spring bird counts at Long Point show an annual growth rate of 30% prior to 1993 and a 16% growth rate between 1970 and 2000.
- All four data sets indicate very rapid growth rates of between 10% and 21% per year.
- An increase of 10% per year leads to population doubling every 7 years.

- This rapid growth is probably a consequence of:
  - Establishment of populations in new habitats, climatically similar to their native range in Europe.
  - Few natural predators.
  - Little inhibition from native waterfowl.
  - Minimal disturbance – they are protected under the Migratory Bird Act.
  - Reduced availability of lead artifacts
  - Recent warming trend = increased reproductive output and overwinter survival.
- What is the potential carrying capacity of the lower Great Lakes for feral Mute Swans?
  - If the carrying capacity of Mute Swans around the lower Great Lakes is similar to the carrying capacity of the species native European range, we could expect that, at present growth rates, the population could reach 30,000 birds within 30 years or less.

Management

- Egg addling - Rhode Island n= 1600
- Adult culling - Vermont n= 0, Ohio n = 150
- In view of their high potential growth rate, it could be necessary to remove at least 30-40% of the lower Great Lakes population every year to lead to a reduction. The same is probably true for the Chesapeake Bay population.

Recommendations

- Mute Swans should be removed from the list of species protected in Canada and the U.S.
- An appropriate international management plan should be devised to deal with this rapidly growing problem right away.
- Start controlling Mute Swans ASAP!!

Final Points

- Redistribution of same-sex pairs will only exacerbate the problem. Regardless, the problem is far too big to deal with in this manner - thousands of birds would need to be relocated every year.
- The onus should not be on scientists and managers to prove that exotic species are harmful prior to control, e.g. zebra mussels. Regardless, there is enough scientific and anecdotal evidence to justify control.
- The removal of protective status and implementation of lethal control measures is not a ploy to allow hunters to include another species in their bag. Hunters are merely an efficient and cost-effective management tool that could ASSIST in Mute Swan control.

Petri said mute swans consume about 8lbs. of submerged aquatic plants/day, but uproot about 20 lbs. per day. He said that lead consumption was the primary limiting factor for mute swans in Europe. But now with the ban on lead shot that limiter has been lifted. He said that 80% of nests must be addled for control and that you must kill 30% of the adults to see a decline in numbers. Petri responded to the following questions:

- Are they good to eat? Petri said that smoked or slow cooked they are good, but roasted or barbequed they are terrible. He said you can do nothing to cormorants to make them edible.

- Your focus was on the Great Lakes, but where else will they spread? Petri said that anywhere where you have open water in winter they will do o.k. A lot of waterfowl will drop body fat in winter, but mute swans pump up body fat in winter to survive cold as long as open water is available.
- Are mute swans a problem everywhere? Petri said that they are taking off on the Pacific Coast on the Canadian side, but are not taking off in Michigan as well. He said that they are really good parents, with both caring for the young and defending the nest.
- Would a bounty program be effective? Petri said it probably would, but there is the problem with people getting less careful once a financial incentive is involved, and that would arouse more opponents.
- Are there any documented reductions of other waterfowl? Petri said that there is a study on Lake Ontario, but the problem is that you need to be at carrying capacity to do such a study. Rendall said that in MN the mute swans are keeping loons from nesting on some of the lakes, and that they are also competing with other white birds. He said that whenever white birds show up they get very aggressive. Petri added that they have displaced skimmers on Chesapeake Bay.

A short break was taken followed by member reports (3 minute oral) since Cindy Kolar had not yet arrived to make her presentation. Proctor said that we will try to fit Kolar in later on the agenda. She said that Kolar had some travel problems, but that she will arrive later. If she does not arrive, Proctor said, we will put comments together later on. After member oral reports were given, Proctor thanked everyone for being so succinct. Written copies of member reports were provided to attendees. Additional copies are available upon request.

Time was then provided for public comments. Pam Chaffee (Coast Guard Auxillary) said that she represents the volunteer component of the U.S. Coast Guard, and that we are out there, we have direct contact with the public, we teach boating safety, so we have direct contact with the boaters, and we want you to use us to get the message out to the public. Here in Kansas, she said, we have been included in state plans, and we appreciate all of the brochures, stickers, etc. that we get from you. She said she wanted to emphasize your inclusion of us in this, so that we are in a better position to educate the people. Please use us she said.

After a lunch break Proctor introduced Chris Dionigi, National Invasive Species Council (NISC), who made the following points in a Power Point Presentation, entitled, **The National Invasive Species Council - Update**:

<u>Invasive Species Definition</u>

- Invasive species can be plants, animals, or microorganisms.
  - Species that are not native to the ecosystem under consideration.
  - Whose introduction causes or is likely to cause economic or environmental harm or harm to human health (E.O. 13112).

<u>Invasive species can be found around the world in:</u>

- Mountain Streams - New Zealand Mud Snail
- Open Oceans - *Didemnum* cf. *lahillei Sea Squirt*
- Livestock - Foot & Mouth Disease
- Range Land - Yellow Star Thistle
- Crop lands - Soy Bean Aphid
- Cities - Formosan Subterranean Termite
- Great Lakes - Zebra Mussel
- Forests - *Phytophthora ramorum*
- Wetlands - *Arundo donax*

Invasive species impact:

- the environment e.g., endangered species - "About 42% of the species on the threatened or endangered species lists are at risk primarily because of invasive species." Wilcove, D.S., et al. 1998. Bioscience 48 (8), 607– 615.
- the economy – fouling organisms.
- crop production.
- human health – imported Fire Ants.

Invasive species cross jurisdictional & geographic boundaries.

- Interjurisdictional cooperation is essential
- Coordination is essential to cooperation

Executive Order 13112 (Issued in February 1999) established the National Invasive Species Council (NISC).

- Established to ensure that Federal agency activities are:
  - Coordinated
  - Complimentary
  - Cost e.g., efficient
  - And Effective
- Council's Co e.g., Chairs: Interior, Agriculture, & Commerce
- Other Members: DOT, DOD, Treasury, State, EPA, HHS, USAID, DHS, USTR, & NASA.
- More than 35 Federal agencies share the responsibility & authority over invasive species management along with all 50 states, tribes, & territories.
- NISC Staff works to:
  - Stay current with federal, state, tribal, local, & private efforts.
  - Staying current with the scientific literature
  - Track legislation
  - Identify duplications
  - Develop strategic approaches
  - Obtain technical & stakeholder inputs
  - Analyze efforts
  - Develop reports
  - Respond to media & public inquires
  - Support decision
- NISC Staff has an extensive & growing coordination responsibility.
  - About 35 federal agencies & 27 federal laws have some role/impact in invasive species
  - About 300 federal/state/private programs, 150 groups & 200 organizations have at least some involvement with invasive species.
  - NISC staff have had some contact with about 2800 individuals that are engaged in the issue.
- Direct Invasive Species Operations:
  - Preventing Invasive Establishments
  - Early Detection & Rapid Response
  - Managing Existing Invasive Populations
  - Restoring Resources
- Required Support of Direct Operations
  - Leadership, Planning & Coordination
  - Prevention Research, - Pathways & Screening
  - Management Research - Detection & Control
  - Public Outreach & Media Relations

  - Training & Worker Protection
  - Project Oversight, Permitting, & Contracting
  - Monitoring, Inventorying, & Mapping
  - Information Management & Analysis
  - International Efforts
  - Information Sharing - Meetings, Workshops, & Continuing Education
- Total Federal Spending FY 05 of $1,169,113K
  - Control
  - Research
  - Prevention
  - ED & RR
  - Leadership
  - Public Awareness
  - Restoration
- Prevention – the first line of defense.
  - Screening for intentionally introduced species.
  - Identifying pathways for unintentional introduction.
- Available Publications
  - General Guidelines for the Establishment & Evaluation of Invasive Species Early Detection & Rapid Response Systems
  - Guidelines for Ranking Invasive Species Projects - Version I (May 2005)
  - Guidelines for NEPA & Invasive Species (In DRAFT)
- Education & Public Awareness Programs
  - Species of the Month & Case Studies
  - Stakeholder Announcements

Final Thoughts:

- Although Invasive species can be "everywhere."
- They are not everywhere.
- We have extremely valuable resources to protect.

Dionigi responded to the following questions:
- What is the status of the management plan revision? Dionigi said the management plan is revised periodically, and that the Steering Committee is looking at overall goals and objectives for invasive species. He said that they will then suggest a format for the plan. He said that more specific actions will carry on from the original 2001 plan, plus current input from the various working groups and committees. He noted that many of the WRP and MRBP members are involved. If not, he encouraged all to get involved. He said if you work for a federal agency, contact your agency liaison to get involved. If not, he said contact me. You can be involved in development and writing of the plan. The whole thing will then go through public review.

Proctor then introduced Erin Williams, U.S. Fish and Wildlife Service. Williams made the following points in her Power Point Presentation, entitled, I**njurious Wildlife Provisions of the Lacey Act (18 USC 42 ~ 50 CFR 16)**:

What is an injurious wildlife species?

- Those species, including offspring and eggs, that are found to be injurious to:
  - Health and welfare of human beings
  - Interest of forestry, agriculture, or horticulture
  - Welfare and survival of the wildlife or wildlife resources of the U.S.

What is prohibited if a species is listed?

- Importation, or interstate transport between States, the District of Columbia, the Commonwealth of Puerto Rico, or any territory or possession of the U.S. Note: Importation and Interstate transport of dead animals is not prohibited unless specifically stated (salmonids).
  Exceptions:
  - Permits may be issued for zoological, educational, medical, scientific purposes
  - Federal Agencies, without a permit, for their own use
- A listing would not prohibit intrastate transport or possession of species within States, where not prohibited by the State. Any regulation pertaining to the use of species within States would continue to be the responsibility of each State.

What may be listed under the Injurious Wildlife Provision?

- Wild mammals,
- Wild birds or eggs,
- Live or dead fish (including mollusks and crustaceans), gametes or eggs,
- Amphibians or eggs, and
- Reptiles or eggs

What is currently listed? (50 CFR 16.11-16.15)

- Mammals
  - Flying fox or fruit bat genus
  - 7 mongoose genera
  - European rabbit genus
  - Indian wild dog, read dog or whole genus
  - Multimammat rat or mouse genus
  - Raccoon dog
  - Brushtail possum
- Birds
  - Pink starling or rosy pastor
  - Species of dioch
  - Java sparrow
  - Red whiskered bul-bul
- Fish, Mollusks, Crustaceans
  - Walking catfish family
  - Mitten crab
  - Zebra mussel
  - Live or dead whole fish, live fertilized eggs, or gametes of salmonids unless they have a health certificate
  - Live fish or viable eggs of Snakehead family Channidae
- Reptiles
  - Brown tree snake
- Amphibians
  - None

Who implements the Injurious Wildlife Provisions?

- U.S. Fish & Wildlife Service (USFWS) – promulgates regulations for additions
  - Division of Environmental Quality evaluates species and provides recommendations to the Secretary.
  - Law Enforcement enforces regulations.
  - Division of Management Authority issues permits.

How can permits be obtained?

- USFWS Division of Management Authority issues the permits.
  - Federal Fish and Wildlife License/Permit Application Form 3-200-42.
  - On the web: http://forms.fws.gov/3-200-42.pdf 1-800-358-2104

What is the listing process?

- Evaluation can be initiated with or without a petition.
- If warranted, it will be published a Federal Register notice requesting biological and economic information.
- Scientific data will be evaluated using established criteria.
- Economic data (costs & benefits of potential rule) will be evaluated.
- Required determinations (NEPA, RFA, Executive Orders) will be completed.

How does the USFWS use Risk Assessments?

- If available, a Risk Assessment is one tool that the USFWS uses to evaluate the injuriousness of a species.
- Biological synopses are particularly useful as the Service does its own analyses.
- Risk Assessments are not required, but are useful to an evaluation.
- A species can be listed without risk a assessment.

What is the listing process?

- If found to be injurious, a proposed rule would be published to add to the species to a list and request public input.
- Public comments & data are evaluated.
- A final rule is published to add species to the list or a notice explaining why the species will not be listed
- There can, however, be variations in this process.

Can the USFWS do an emergency listing?

- We do not have emergency listing authority under the Lacey Act.
- Under "good cause" of APA, can make a final rule effective upon publication.

What is evaluated?

- Factors that contribute to injuriousness
  - Release/escape
  - Survival/establishment
  - Spread
  - Impacts on Wildlife resources and/or ecosystems (hybridization, competition for food/habitats, habitat degradation/destruction, predation, pathogen transfer)
  - T & E species and their habitats, Human beings, forestry, horticulture, agriculture Wildlife/habitat damages due to measures used to control injurious species
- Factors that reduce or remove injuriousness
  - Ability to:
    - Prevent escape/establishment
    - Eradicate
    - Manage established populations
    - Prevent/control the spread of pathogens
    - Rehabilitate/recover disturbed ecosystems
  - Ecological benefits to introduction

- Other factors (sterility, triploidy)

The "Other" Lacey Act (16 USC 3371-3378)

- Umbrella statute to provide additional protection to fish, wildlife and plants taken, transported or sold in violation of state, tribal, foreign or U.S. law.
  - Regulates importation of injurious species
  - Regulates marking of containers that contain fish, wildlife or plants and are shipped in interstate or foreign commerce
  - Provides for humane shipment of fish and wildlife
  - Protects indigenous plants
- History
  - The Lacey Act is the first national fish and wildlife law, enacted in 1900 as a federal tool to assist states in enforcing state wildlife laws.
  - The Black Bass Act extended protection to fish (combined with the Lacey Act in 1981).
- Two Step Violation Process 16 USC 3371-3378
  - That the wildlife was *taken, possessed, transported or sold* in violation of a underlying state, federal, foreign or tribal law or regulation, *and*
  - That, in addition to the above violation of underlying law, the wildlife was *imported, exported, transported, sold, received, acquired or purchased* in a manner prohibited by the Lacey Act.
  - These two steps may not be collapsed into one: United States V. Carpenter, 993 F.2d 748 (9th Cir. 1991)
- There 97 wildlife inspectors looking at 140,000+ shipments/year.
- Needs:
  - Provide data to assist evaluations
  - Develop database of State listed injurious/prohibited wildlife
  - Coordinate with FWS Law Enforcement ports of entry within your region

Williams responded to the following questions:
- What is the title of the other lacey act? Williams said it is just the Lacey Act.
- If someone imported a state banned species that would invoke the "other" lacey act, is it true that a federal person has to be present to enforce the law? Williams said that would be a question for law enforcement. But you would have to have both steps present, and it's pretty difficult to meet both of those criteria. Both a point of origin and a point of receipt violation are needed to trigger the lacey act.
- If zebra mussels are transported across state lines is it only illegal if it is intentional? Williams said no, but law enforcement would not throw the book at the violator either. They're not looking for "mom and pop" violations, she said, but the states can enforce to the extent desired.

Proctor then introduced Tom Mosher (KS) who addressed the Asian Carp Management and Control Plan in place of Greg Conover (USFWS). Mosher said that Greg sends his regards and regrets. He's been given a short deadline to get the report done, and was unable to attend. Mosher said that the whole plan development process started in Columbia, MO in June 2004 at a facilitated meeting. Many concerns were addressed and various teams began drafting the plan. He said that several people in attendance at this meeting participated: Bob Pitman (USFWS), Cindy Kolar (USGS), Jerry Rasmussen (MICRA/USFWS), Jay Rendall (MN), Mike Hoff (USFWS), Nathane Stone (University of Arkansas), Steve Shults (IL), Tom Flatt (IN), Valerie Barko (MO), and Duane Chapman (USGS). He said that a second meeting was held in Madison, WI in conjunction with the annual American Fisheries Society meeting. He said that a draft plan had been sent out in June to non-writing work group members. Then a meeting was held in Nashville in late August for further review. He said that at the Nashville meeting the plan was picked apart as best it could be. He said the contentious items were talked about and ironed out as best we could.

Now the plan is back with the writing team to be revised, and contentious points are being rewritten. Also, he said that the Team is working to reduce redundancy, and reduce contentious points. He said that biologists and economists are not speaking on the same plane, and in some cases not communicating with each other. The original plan was 200+ pages long, and the deadline for rewrite has been extended form September 16 until September 30. But that's still not very much time. He said the disappointing part of plan was that out of all the states that could have implications in the plan only 4 attended the meeting. So, if state's have concerns about the Asian carp invasion they haven't provided the type of input needed to get the plan off the ground. He said that the states need to be more involved because this is not just a federal plan. Right now the plan is back for redraft, he said, and we don't know if there will be enough time for review before it goes to the USFWS or not. He said there will be a notice in the in the federal register for review after that the plan reaches the USFWS. He said the bottom line is that the plan has to be able to work for all of us, not just for one side.

No one had any questions regarding Mosher's presentation.

Mike Hoff then discussed management implications regarding bighead carp stock recruitment. He said that fish are overexploited all over the world, so if we look at stock recruitment methods we should be able to create a market that over exploits invasive fishes. Development of a stock recruitment model is the necessary first step in developing a management plan for any sexually reproducing vertebrate. He then made the following points in a Power Point Presentation, entitled, **Management Implications from a Stock-Recruitment Model for Bighead Carp in the Illinois and Mississippi Rivers**:

Mathematics and Invasive Species

- Mathematics is often used to understand complex ecological functions.
- Understanding ecological functions may result in implications for controlling established invasive species.

Population Dynamics of Fishes

- The dynamics of most fish populations are driven by a combination of:
  - Recruitment
  - Growth
  - Survival
  - Immigration and emigration

Importance of Managing Recruitment

- For many fishes, recruitment is the factor that most influences abundance of adults and juveniles.

When is recruitment set?

- Recruitment is best measured at the earliest life stage, after year-class strength is set

for most fishes at our latitude in the U.S., recruitment is measured either at the fall-fingerling or spring-yearling stage.

Stock-recruit models for preferred species

- Stock-recruit models have been developed by several scientists to help manage populations for preferred species, protection and enhancement of adult abundance (i.e., STOCK) is an effective management tool to ensure adequate recruitment and sustainability of populations.

The Basic Model

- The basic stock-recruit model uses only adult stock size to predict recruitment.
- If that model accounts for most (e.g., 80-100%) of the variability in recruitment, then that model

will be useful to managers.

- Ricker developed a model for, and tested it on, terrestrial insect and fish population data: $R = Se^{a - bS - cX}$.
- Recruitment (R) is modeled as a function of:
  - Parental stock size (*S*)
  - Density-independent mortality (*a*)
  - Density-dependent interactions (*bS*)
  - Abiotic and biotic factors (cX)

More Complex Models (Use as Needed):

- A more complex model is needed, if the basic model does not account for most of the variability.
- More complex models include:
  - Biotic factors
    - e.g., Predators, prey, competitors, species that buffer predation
  - Abiotic factors
    - e.g., Temperature during incubation, river discharge during larval period

Stock-recruit Models: So what?

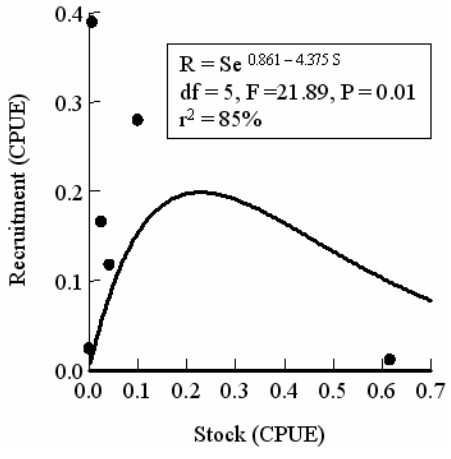
- Stock-recruit models were developed to help sustain and enhance preferred species.
- Can also be used to help control populations of invasive species.

Stock-recruit Models: How do we use them?

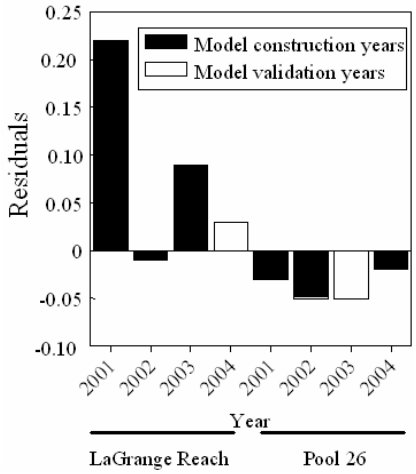
- When harvest or another approach to increase mortality is contemplated, then stock-recruit models can help determine:
  - Feasibility of control
  - Effects of various levels of control effort
  - Estimated control costs
  - Stock abundance maximum, below which recruitment and population size will be controlled
- Stock-recruit models tell managers what variables can be managed to reduce recruitment of invasive species
  - Biotic variables
    - Stock size
    - Manage populations of other fishes
      - Predators, predator buffer species, prey
  - Abiotic variables
    - Manage discharge at dams
      - e.g., Water discharge and influences on water levels affect spawning and nursery conditions and habitat availability

Bighead Carp: Stock-Recruitment Model

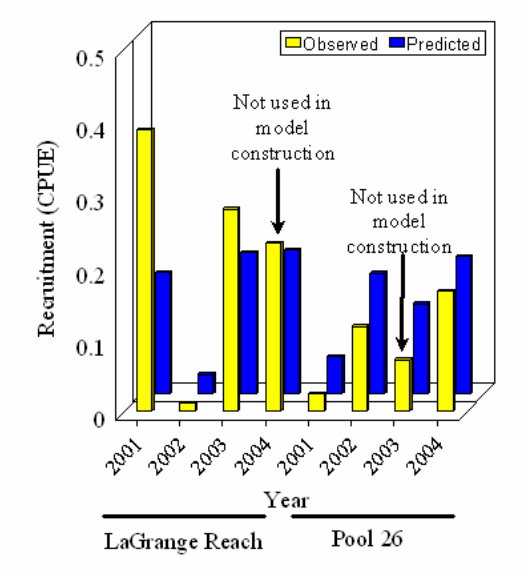
- Empirical stock and recruitment data, and Ricker model of stock – recruit relationship, for bighead carp in LaGrange Reach and Pool 26, 2001-2004.



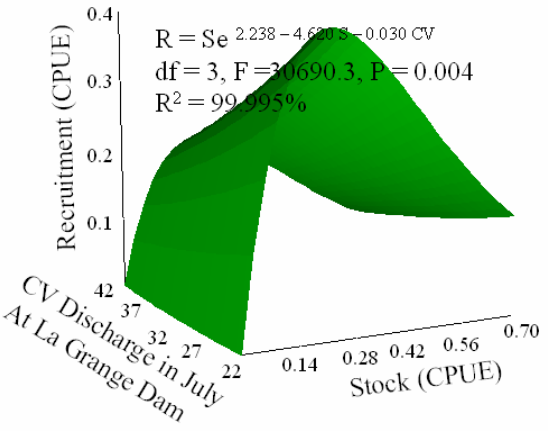
- Comparison of bighead carp recruitment model residuals for LaGrange Reach and Pool 25, 2001-2004. Data for LaGrange in 2004 and Pool 26 in 2003 not included in model construction.



- Comparison of observed and predicted recruitment of bighead carp in LaGrange Reach and Pool 25, 2001-2004. Data for LaGrange in 2004 and Pool 26 in 2003 not included in model construction.
  - R = Se 0.861 – 4.375 S
  - df = 5, F =21.89, P = 0.01
  - r2 = 85%
  - Model predictions were within the 95% Conf. Limits of the empirical values



- Trivariate Ricker model of stock – recruit relationship, for bighead carp in LaGrange Reach, 2001-2004.



Conclusions

- The bivariate model for bighead carp in the La Grange Reach and Pool 26 explained 85% of the recruitment variability by stock size alone.
- The model was validated using two techniques.
- The trivariate model for only the La Grange Reach is significant, and explained nearly 100% of the recruitment variability
    - Stock size explained 85% of recruitment variability
    - River discharge explained nearly 15% of recruitment variability

Management Implications

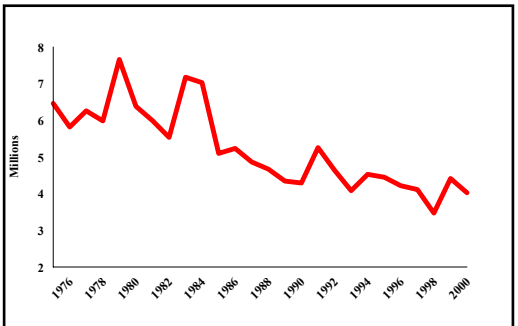
- Virtually 100% of the recruitment variation in the LaGrange Reach is manageable.
- In both the La Grange Reach and Pool 26 controlling bighead carp stock size will reduce recruitment.
- Controlling recruitment will limit adult abundance over the long term.
- Adult stock size should not exceed about 0.05 catch/unit of fishing effort in gill nets
    - 0.05 adults/unit of fishing effort should be the target maximum abundance in a control plan for bighead carp in the LaGrange Reach and Pool 26
- Increasing river discharge variability in the LaGrange Reach will reduce bighead carp recruitment there
    - Increasing variability in that reach would need to be achieved by managing discharge at La Grange Dam, and presumably all upriver and downriver dams (6 above dam in the IL River, 2 below in the IL & Miss. Rivers)

Hoff responded to the following questions:
- Has anyone applied a model to the impact of invasive species on desired species? Hoff said this model would be first step in doing that. It would show the effect through time on the fish community.
- Was that data collected on Upper Mississippi River Basin Long Term Resource Monitoring Program? Hoff said yes it was. John Chick and Valerie Barko received a small grant to do some modeling, but found no significant effect at this time on bigmouth buffalo, but they did show an impact on gizzard shad.

After the break Jay Rendall showed an Asian carp video (dvd) produced by his agency for showing to the Minnesota Governor's office and legislative panel. Rendall mentioned that a limited number of copies are available from his office.

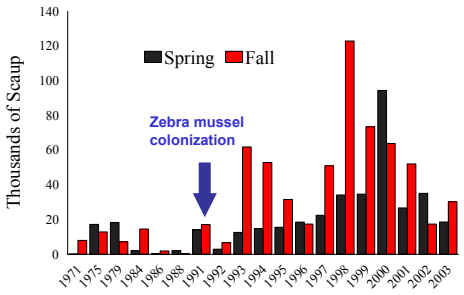
Proctor then reintroduced Scott Petri, who discussed the effects of zebra mussels on diving ducks. Petri made the following points in a Power Point Presentation, entitled, **Contaminant burdens and migration patterns of scaup using the lower Great Lakes**:

- Greater and lesser scaup have combined populations that really can't be separated, so they must be considered together.
- Population declines correspond with population expansion of zebra mussels.
- The scaup switched to zebra mussels which were readily available and had caused declines in native foods.
- Diving ducks overall over-wintered in the Great Lakes in greater numbers after zebra



Scaup population estimates from breeding ground surveys, 1975-2000.

mussel showed up. During this period we also have had warmer winters.



Peak number of Lesser and Greater Scaup counted during Long Point, Lake Erie aerial surveys, 1971-2003.

- Since the late 1990's we have seen a significant decline in scaup numbers. We're not sure if this is due to decreased reproduction or survival.

- We have looked at contaminant burdens in scaup livers.
  - PCBs and DDE do not seem to be a problem.
  - As for metals and metalloids, selenium is the only one that is potentially problematic.

- Facts about Selenium:
  - Nutritionally required by birds in small amounts
  - It becomes highly toxic in slightly greater amounts
  - Liver concentrations of 10 ug/g (dry weight) are associated with reproductive impairment in Mallards (Heinz et al. 1989).
  - Liver concentrations above 33 ug/g (dry mass) are associated with health related problems in Mallards (Heinz et al. 1989).

- Scaup return to the Great Lakes in the fall with reduced selenium loads. Why are there seasonal differences?

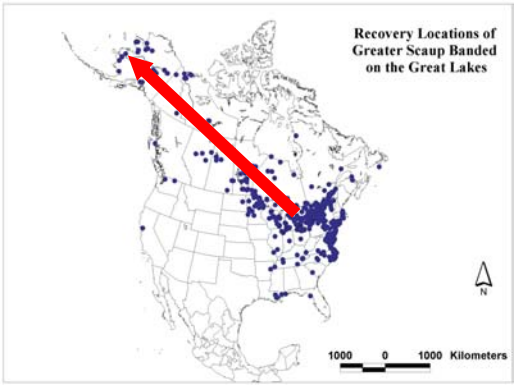
- Samples were taken out of the crops of birds.

- Fall zebra mussel selenium loads were below detection of equipment, but in Spring the numbers were much higher.

- Zebra mussels filter feed all year, but can only download selenium via production of veliger larvae during summer. So the fall load is down (2 ug/g is limit). This is probably the main avenue the zebra mussels have for selenium downloading (3-6 ug/g is toxic).

- Birds in other flyways had only 25% elevated selenium levels, where in Great Lakes they had 75% elevated levels.

- We know we have increased selenium levels in the Great Lakes. It is an additive to livestock feeds.



- We believe that zebra mussels are picking up selenium and scaup target zebra mussels as food.

- We have no idea of the impact on continental scaup populations.

- Satellite tracking is now being used to track where Great Lakes scaup are going.

- We've determined that they don't all go to the same

place.

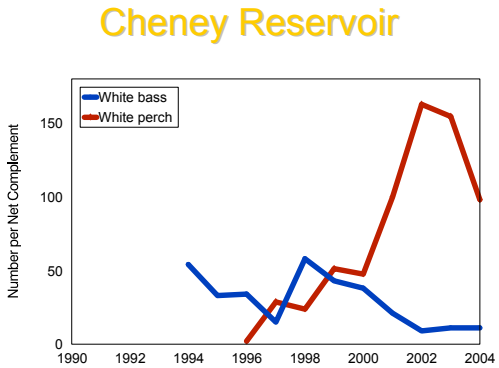
- We're concerned about how much selenium the scaup have in them when they reach the breeding grounds (10 ug/g threshold for scaup).

- They are arriving with high loads at breeding grounds. Chronic effects are seen in the liver burden.

Petri answered the following questions:
- Your theory about where the selenium goes is good, but how do cold and warmwater phytoplankton affect how it is accumulated by these critters? Petri said he thought there is literature out there on this.
- You didn't show any effect from PCBs or DDEs, but what about other metals and their interactions with selenium? Petri said mercury does react, but the levels were quite low. He said that everything had significant increases through Spring, but not to problematic levels.
- Did you have discussion with Yukon delta folks? Petri said that he had not because their research was done before he started on this project.

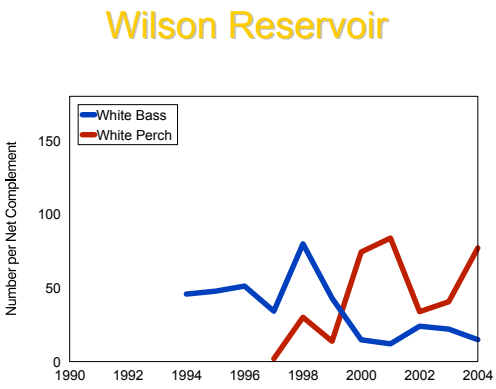
Tom Mosher then discussed the impacts of white perch. He said that if it weren't for the impacts of zebra mussels and Asian carp, we might be talking about white perch instead. He said the white perch also entered the Mississippi River Basin via the Chicago Sanitary and Ship Canal. He said the general food habits of the white perch make it a very invasive species. Also, he said, large year classes are typical and white bass populations are impacted. Another problem, he said, is that they hybridize with white bass. He said that anglers would much rather catch a 12-15 inch white bass than a smaller white perch. He said that the Wilson Reservoir (KS) population may be controlled by three species of bass (largemouth, smallmouth and spotted) as well as by striped bass. He made the following additional points in a Power Point Presentation, entitled, **White Perch**:

- Comparison to white bass:
  - White perch have a more prominent lateral line stripe
  - White perch have equal length jaws
  - White perch dorsal fins are connected
  - White perch have 8-10 Soft Anal Rays
  - White bass have 11-13 Soft Anal Rays
- Original range of white perch:
  - S. Carolina-Gulf of St. Lawrence
    - Coastal Rivers & Estuaries
    - Inland Rivers
    - Ponds & Lakes
- Expanded range of white perch:
  - Great Lakes via Erie Canal
    - Lake Ontario via Oswego R. 1950
    - Displaced yellow perch in Bay of Quinte by 1957 (Sheri & Power 1968)
  - Upper Mississippi R. via Chicago S & S Canal
  - Platte R. NE via stocking-1964
  - Missouri R. KS & MO-expansion
  - Kansas & Arkansas R. via accidental stocking-1994
- White perch food habits



- Omnivorous
    - Macroinvertebrates
    - Aquatic Insects
    - Zooplankton
    - Fish
    - Fish Eggs-including their own

- White perch spawning
    - Spawning season: March-July - 13-17 C
    - Age at maturation
        - Females 2-4 years
        - Males 1-3 years
    - Fecundity F=842.6W-29,864 (r=0.97)(Mosher 1976)
        - 40,000 Age 3 (76 g)
        - 230,000 Age 6 (350 g)



Mosher responded to the following questions:
- Are the hybrids fertile? Mosher said he wasn't sure, but that he didn't think that many are.
- Have you noticed any other species declining? Mosher said that walleye numbers have decreased dramatically in Cheney Reservoir, and that seemed to be more the cause and effect of white bass.

Proctor then turned the meeting over to Susan Ellis for the remainder of the Member Reports.

The meeting adjourned for the day at 4:30 p.m.

Both panels met separately the following morning, and then came together for a joint meeting in the afternoon.

Proctor called the meeting to order at 1:00 p.m. and made a few house keeping remarks regarding the following day's field trip. She then introduced Roberto Mendoza, who made the following points in a Power Point Presentation entitled, **Raising Awareness on Aquatic Invasive Species in Mexico**:

<u>Objective</u>

- Raise the awareness of all sectors related to aquatic invasive species in Mexico in order to develop a *National Strategic Plan* for the prevention, control and eventual eradication of AIS.
    - Establish a common perspective on issues concerning AIS.
    - Identify areas of cooperation:
        - Among the federal agencies.
        - Between these agencies and the rest of the sectors involved.
    - Identify gaps in prevention, control and eradication of AIS.

<u>Prevention</u>

- Develop a list of existing and potential invasive species (characteristics, history in other regions).
- Dynamic lists (annual update)
    - Black/White lists
    - Risk Analysis for importation or introduction in NPA
    - List of all the species used in aquarium trade and aquaculture (including genetic characteristics)
- Enrich CONABIO database with info from collections of universities and federal agencies

(e.g. import data)
- Develop interoperable databases

- Improve taxonomic capacities
  - Formation of taxonomic workgoups
  - Increase training for wildlife biologists, government officials, resource managers, public health officials, policy makers, and resource users
- Federal agencies will review pathways already identified

Information

- Directory of who is who in invasive species
- Determine taxonomic and geographic information needs
- Make available information on sources of funding and technical assistance
- Promote the modeling of bioinformatics predictions

Monitoring and Early Response

- Establish a continuous monitoring network
  - Universities, Research Centers, Federal and State agencies
  - Coordination at the state and national levels
  - Web page for early detection and monitoring
- Develop emergency response program
  - Contingency state plans
- Invasive species risk maps

Public Awareness

- Public Awareness tools
  - Translation of educational materials and video/books and identification aids
  - Start an educational campaign to raise environmental conscience in regard to AIS
- Link web pages of universities and federal agencies to CONABIO web site on AIS
- Course on AIS in universities
- Promote AIS issue in different meetings (National Congress o f Zoology)

Research & Development

- Identify and coordinate research needs on life history of invasive species
- Encourage research for the use of native species for aquaculture and aquarium
- Evaluate socio-economic impacts of AIS
- Include the AIS issue as a priority for research funding (CONACYT, CONABIO, Ministries, etc.)
- Multidisciplinary research group (design control strategies, evaluate damage, direct actions to avoid their dispersion)

Legal Framework

- Identify gaps in the present legal frameworks
- Analyze international and domestic regulatory and non-binding frameworks

Cooperation (National)

- Invasive Species Network (Federal, regional agencies, Universities, research institutes, stakeholders, NGO´s) coordinated by CONABIO
  - Work on a National Strategy Plan on Aquatic Invading Species in Mexico
- Develop better communication tools and have a permanent communication with all the sectors involved with AIS

- Federal agencies' Meeting to organize a common work agenda

The International Context

- Once invasive species become established within one country, they pose a threat to an entire region.
- Increasing the capability of other countries to effectively manage invasive species and invasion pathways domestically will improve the ability to prevent invasive species from spreading in the region.

International Cooperation

- Share information and technical assistance
  - ANSTF representatives agreed to:
    - Share databases (e.g. GMSARP, NAS)
    - Provide training (Risk Assessment, HACCP training course)
- Improve scientific exchange and common projects
- Workshops and congress
  - Define international priorities
- Include representatives of the region in local panels (Canada, EUA, Guatemala, Honduras)
- Share risk assessments among countries and agencies

CEC's Trinational Meeting on Aquatic Invasive Species Risk Analysis, February 22, 2005, Arlington, VA

- Develop Risk Analysis Guidelines for field-testing under the CEC
- Meeting goals:
  - Agreement on a common protocol for Risk Analysis
  - Select the test pathway and aquatic organism
- Species of Concern
  - Canada: Snakehead and Asian carp
  - United States: Snakehead, Asian carp, and Tunicate
  - Mexico: Sailfin Catfish, New Zealand Mud Snail, and Zebra Mussel
- Pathways
  - Canada: Live food, aquarium and live bait
  - United States: Live bait, live food, hull fouling
  - Mexico: Aquarium, hull fouling, live bait
- Conclusions
- The three countries agree to adopt regional standards
  - Regional proposal for Risk Analysis based on the original proposal of USA
    - Aquarium: Canada, USA and Mexico
    - Suckermouth catfish: USA and Mexico
    - Snakehead: Canada and USA

Mendoza responded to the following questions:
- Are there any parallel efforts underway with regard to funding or legislation? Mendoza said that is a difficult question to answer because next year is an election year, and it depends on who will be in the various ministries. Funding is very restricted.

MRBP Chairman Rendall then led off a session on Marketing Strategies. He said that we all need to be aware of the ideas that others have used to change people's attitudes through education and the results they have achieved. He made the following points in a Power Point Presentation entitled, **Aquatic Invasive Species Awareness: Ideas and Results**:

- Public Awareness is a key to preventing the spread of AIS.
- There are many ways of informing our target audiences.
- Changes in behavior are the goal - e.g., to remove plants from boats.
- Surveys indicate that boaters are willing to take action /change their behavior if they know what to do.
- Boaters' motivations for taking action were often to keep AIS "out of my lake" or because "it is my personal responsibility."
- Effective public awareness efforts tap these motivations, stress why preventing the spread of AIS is important, and deliver concise, reasonable actions and consistent messages.
- One indication that AIS education works is the change in percent of Minnesota boaters who took action. It increased by about 20%, (from 70% to 90%) between 1994 and 2001.
- There are many products and means to reach the public:
    - Signs
    - ID cards
    - Posters
    - Videos
    - TV and radio spots
    - Brochures
    - Fact sheets
    - Stickers
    - Booklets
- Which methods work best?
    - Signs are one of the top media to inform boaters.
    - Watch cards can help in reporting infestations.
    - Regs booklets rated high.
    - Billboards can be good reminders.
    - Radio and TV media rate high.
    - Newspaper articles and ads can tell what to do.
    - Stickers and tags are used for specific situations.
    - Gas Pump Ads are a new tool.
    - Displays/Exhibits.
    - Calendars can reach professionals.
    - Traveler Information Systems are a communications tool, but of unknown effectiveness.
    - Watercraft inspections are now used in several states to inform boaters.
- Are we and should we be seeking changes in behavior for others pathways? - e.g., hikers, ATV operators, truckers, heavy equipment operators.
- If yes, actions and information specific to their pathway should be developed and provided.

Rendall responded to the following questions:
- Were there things that were less useful. Rendall said that the results of boater surveys show that internet and workshop effectiveness were very low for boaters and anglers.

Cindy Kolar (USGS) suggested that the states could think about controls for campfire wood. Perhaps people should be restricted from bringing wood from another area to a public campground.

Robyn Draheim, Center for Lakes and Reservoirs, Portland State University then made a presented from the Oregon perspective. Draheim said we're taking preliminary steps, but we don't have a big media blitz in Oregon. There are a lot of threats and we have a real need for outreach to educate people and build support for a diversity of efforts. Draheim then made the following points in a Power Point Presentation entitled, **Proposed Statewide Awareness Campaign on Invasive Species - Marketing and Outreach**

Strategy:

Purpose and Scope

- The purpose of the Oregon Invasive Species Council (OISC) shall be to conduct a coordinated and comprehensive effort to keep invasive species out of Oregon and to eliminate, reduce, or mitigate the impacts of invasive species already established in Oregon.
- The OISC will address non-native organisms that cause economic or environmental harm and are capable of spreading to new areas of the state.

Outreach Campaign

- The campaign will serve three primary purposes:
  - To raise basic awareness among Oregonians of the invasive species problem; for example
    - What are invasive species?
    - How do they harm Oregon?
    - What are simple things that everyone can do to help?
  - To build support and engagement for a diversity of efforts among specific audiences for targeting specific invasives, and
  - To help build the political will and constituency support to encourage policy makers to address the invasive species problem effectively at statewide, regional and local scales.

Statewide Awareness Campaign

- Campaign Strategy Development
  - Timeline: February 2005
    - Budget – $20k
- Fundraising
  - Projected Timeline: Fall 2005
- Campaign Development
  - Projected Timeline: Fall/Winter 2004/2005
    - Projected Budget: $100k - $1M
    - Campaign strategy will outline options at multiple funding levels in this range.
- Campaign Launch
  - Projected Timeline: Spring 2006
    - Timing to coincide with start of outdoor recreation season, gardening, etc.

Campaign Development

- Step One: Seek professional help:
  - Evaluate current efforts and
  - Develop a campaign "blueprint" that will include a marketing implementation plan.
    - Including recommended messages, tools, strategies for paid and earned media utilization, delivery process and timing, partnership suggestions and an annual measurement process to evaluate campaign success.
- Learning from Other Campaigns
  - Hawaii – The Silent Invasion
    - Key issues included inadequate rules and laws, conflicting agency mandates, ill-defined jurisdictions, a lack of planning and cooperation to address new pests, and a tremendous lack of public awareness about the problem and solutions.
    - The Coordinating Group on Alien Pest Species (CGAPS) was formed in 1995.
    - One of the most important accomplishments of CGAPS was the Silent Invasion media campaign in 1997, which included television commercials, print ads and dramatic pamphlets about invasive species.

        - The campaign ran for close to a year, but since then media efforts (other than press releases) all but stopped due to a lack of funding and dedicated staff to coordinate a fresh campaign.
        - CGAPS now has a coordinator and a public information officer and a new campaign.
    - Montana – Pulling Together Against Noxious Weeds
        - In 1995 the Statewide Noxious Weed Awareness and Education Campaign Group developed a mission statement that reads "For the people of Montana to realize the economic and environmental impacts of noxious weeds, to become supportive of all aspects of noxious weed efforts, and to implement integrated weed management across the state."
        - The strategic campaign is a coordinated effort… The benefit of the campaign to all state and federal agencies is the effective use of combined dollars to reach a broader audience at less cost. A full-time campaign coordinator is in place to implement and provide consistency in this statewide campaign.
        - The Group initially focused on concise messages to be delivered to the general public and identified target audiences to channel these messages to.
    - Idaho – Weed Awareness Campaign
        - In 2001, the Idaho Weed Coordinating Committee felt the need for an entity to create public awareness and education on the severe impacts of invasive weeds to Idaho lands and its economy.
        - In September, 2001 the Idaho Weed Awareness Campaign was born. Its mission is for the people of Idaho to understand the economic and environmental impacts of invasive weeds and support the implementation of all aspects of integrated weed management.
        - On January 15, 2002, Governor Dirk Kempthorne issued a Proclamation officially kicking off the Idaho Weed Awareness Campaign.
        - A 17-member Committee oversees the Idaho Weed Awareness Campaign. Idaho Weed Awareness Campaign Coordinator since 2002.

<u>Audience Analysis Conducted by Private Consultant</u>

- Strengths
    - High participation in outdoor activities.
    - Positive support for conservation.
    - Positive messaging
- Opportunities
    - Build awareness of invasive species problems.
    - Partner with similar organizations for joint messaging
- Weaknesses
    - Potential lack of interest among target (to change behavior).
    - Economic factors (regional and national).
    - Potential lack of funds to compete against other messaging in the market
- Threats
    - Competition for conservation message.
    - Retention

<u>Messaging</u>

- The primary messaging for the campaign must embody the beliefs held by the target audiences and compel them to act on those beliefs. This means the campaign should communicate messages on two-levels.

- Level 1: Awareness – Not only what are invasive species but "why" invasive species prevention practices are important. Re-enforce any positive existing beliefs and convince the target audience that these practices are a necessary component to protecting our environment.
- Level 2: Education – As more Oregonians understand "why," they will begin asking "how" and the campaign must provide the answers.

Next Steps

- Campaign Coordinator
  - Three western states with successful campaigns emphasize need for a full-time coordinator.
  - Coordinator position must have stable funding.
  - Ideally, coordinator is versed in invasive species issues as well as marketing, communication, fundraising and/or lobbying.
- Fundraising

Draheim said that positive messaging is a great strength in Oregon. Most people want to do something because they feel it is their responsibility and they want to do something to protect the habitat. He then responded to the following questions:
- With the educational plan we've become marketers/sales people and I wonder if we lose site of our long term goals in the interest of short term gains? Draheim said it is very difficult, but we need to separate the two. It will be a continuous battle.
- In this strategy is there any connection with utilizing the awareness that already exists in the schools because children already have an awareness? Draheim said, yes, recycling campaigns work through schools. Kids bring the message home to the parents, but we need a survey to see how much kids actually do bring home.
- I know you had that bad experience, but if you look at state standards now, almost all states have an ANS standards and they focus around 4th-6th graders as a good avenue. Draheim agreed that this is a great tool, kids do get their parents to react.

Marshall Meyers, Pet Industry Joint Advisory Council, then made a presentation from the Pet Industry perspective. He said that adding species to the list just isn't working. He then made the following points in a Power Point Presentation, entitled, **Dealing With Invasive Species - Prevention Through Education:** .

Objectives

- Change traditional thinking
  - easier to ban than educate
  - avoid increased regulations virtually impossible to enforce
- Unify government, academia and industry to address issue proactively with as little negativism as possible.
- Promote environmentally responsible consumer behaviors.
- Education and Public Outreach
- Programs that
  - Clearly articulate issue
  - Explain risks and how to minimize
  - Provide user friendly identification aids
  - Provide guidance on what to do
  - Graphically pleasing

Habitattitude^{TM}

- The Message

- Nationally branded social marketing campaign targeting aquarists and water gardeners.
- Links environmental messages with beneficial actions.
- Designed to reach targeted audiences.

- Delivering the Message
  - Pet industry
  - Hobbyists groups
  - Academic institutions
  - Environmental NGOs
  - State agencies
  - Federal agencies
  - Others ……
- Principles
  - U.S. Fish and Wildlife Service
  - Pet Industry Joint Advisory Council
  - NOAA's Sea Grant Program
- Industry Promotions
  - Trade and Hobby publications
  - Trade/Consumer shows
  - Open houses
  - Aquarium societies/clubs
  - Internet
- Industry Initiatives
  - Mailers
  - Web sites
  - Fish bags
  - In-store signage
  - Brochures
  - Register receipts
  - Bookmarks
  - Starter kits
  - *Aquademics*
  - Live plant packaging
  - Product labels
  - Care sheets
  - Electronic messaging
  - Static cling signage
  - Employee buttons
  - Trade/Consumer press
  - Bring-it back policies
  - Turn-in campaign

- Industry Promotion – 2005/2006
  - Materials appear in > 2,000 retail stores
    - In-store signage/Door decals
    - Fish bags/Care sheets
    - Product labels
    - Partner Certificates
  - Direct mail – 32 million US homes (approx 50% US pet owning households)
  - Company newsletters, websites
  - Starter kits being designed for small, independent retailers/nurseries
  - Trade/Consumer press and shows

- Industry Focus
  - Retail stores
  - Garden centers/nurseries
  - Live animal/plant producers/importers
  - Manufacturers
  - Distributors
  - Trade/Consumer publications
- Affiliates
  - Federal: USFWS, NOAA, Sea Grant, ANSTF, NISC, National Park Service, Pending (Forest Service, Coast Card, DOD)
  - State: Arizona, Florida, Georgia, Indiana, Kansas, Louisiana, Montana, Michigan, New York, Ohio, Pennsylvania, South Carolina,
  - Other: American Nursery and Landscape Association, IAFWA, Florida Tropical Fish Farms Association, Marine Aquarium Council (MAC), ANSTF Panels: North East, Gulf, Western, & Mid-Atlantic (pending)
- What we would like from YOU:
  - Active support and promotion of the campaign.
  - Encourage the support/participation of state, federal agencies, education, conservation and environmental organizations.
  - Externally - Promotion of the campaign to federal and state legislators as an innovative partnership that offers solutions to the complex challenges of invasive species.
  - Internally – Stepping campaign up and down within your communities….
- What's next?
  - Help us to determine where we can go next with this partnership.

Meyers said that the USFWS invested $125,000 in designing the *Habitattitude*™ brand. That's how it came about. The initial partners were PIJAC and the USFWS. Static-cling materials are being used and tested for color, etc. to show up on an aquarium with fish in it. He said the Forest Service has now signed on as has Coast Guard, Department of Defense. He said we will expand *Habitattitude*™ to cover terrestrials organisms next year. The Fish Bowl logo will go, but the message will stay the same.

Meyers responded to the following questions:
- Is it possible to bring unwanted fish back to the purchase site? Meyers said we don't want diseased fish to come back, so isolation tanks are needed. He said the American Medical Association is working on this. He said that some stores will pay people to take them back, and that humane euthanasia is an issue on the west coast. He said pet store owners don't want illegals back.
- Are Biological Supply houses cooperating on this? Meyers said that one of the problems is that biological supply houses didn't have a clue that things they were selling could cause a problem elsewhere. They were advising schools to release their animals when done.
- Would the preference be to include schools and biological supply houses with *Habitattitude*™. Meyers said we can include them, and we are also encouraging a web base qualification program for new aquarists to become certified.

Cindy Kolar then discussed the Risk Assessment Workshop held in cooperation with the Gulf and South Atlantic Regional ANS Panel in Tampa, FL on August 23-24. She made the following points in a Power Point Presentation, entitled, **Invasive Species Risk Assessment Workshop - Gulf and South Atlantic Regional Panel on Aquatic Invasive Species - August 23-24, 2005, Tampa, Florida**:

Workshop Sponsors and Participants
- Gulf and South Atlantic Regional ANS Panel.

- Some members of the Western Regional Panel and the MRBP participated in the Workshop.
- MRBP members helped develop ideas for speakers and will use this first workshop as a basis for developing a second workshop.
- Attendees included 50-60 persons from various federal, state and private groups.

Workshop Purpose

- Introduce participants to a variety of risk assessment techniques used for AIS.
- Provide attendees with some familiarity of the techniques by using them in exercises.
- Provide attendees with a better understanding of how risk assessments are used by regulatory agencies.

Workshop Agenda and Materials

- The workshop began with a morning of background material on risk assessments.
- A variety of presentations on types of risk assessments and how to use them were made in 1 hr blocks
- Information was provided on how risk assessments are used by regulatory agencies.
- Attendees were divided into two groups for more manageable tutoring.
- Hard copy materials were provided to attendees with background materials beyond what was presented.

Risk Assessment Methods Discussed

- Current ANSTF Generic Risk Assessment Process (Richard Orr, Walt Courtenay)
- ANSTF Generic Risk Assessment Process under revision (Anne Sergeant)
- Species analyst/GARP (Kris McNyset)
- Biological risk assessments (Cindy Kolar)
- Hazard analysis & critical control points (Bob Pitman)
- TNC plant assessment (Doria Gordon)
- ISAC/ANSTF pathways risk assessment (Penny Kriesch)

Risk Assessment Rule Making Discussed

- U.S. Fish & Wildlife Service, listings of injurious wildlife (Erin Williams, Kari Duncan)
- U.S. Department of Agriculture (Wendy Hall)
- U.S. Environmental Protection Agency, ecological risk assessments (Anne Sergeant)

Workshop Outcome

- Conducting risk assessments will require more in-depth information by attendees.
- Attendees were left with a good understanding of the different aspects of risk, a good information base, and background materials.

Future

- The MRBP Risk Assessment and Research Committee is interested in sponsoring the next workshop in about 6 months.
- There also may be interest by other regional panels in cooperating in such a workshop.

Kolar then responded to the following questions:
- How much did it cost and who paid? The Gulf and South Atlantic Regional ANS Panel paid for the workshop, and Kolar did not know what the total cost was. She said it was a stand alone meeting, and was not combined with any other meeting.

Proctor then noted that it was the original plans of the WRP/MRBP meeting planners to have the ANSTF Secretary on the agenda, but the selection process for the new Secretary was not completed in time, so Kari Duncan had agreed to make the ANSTF presentation.

Ms. Duncan said the selection process for a new Secretary has been slow, but that Scott Newsham, U.S. Coast Guard (retired) has been selected and that he would be on board shortly, and that he looks forward to working with us. She then made the following points in a Power Point presentation, entitled, **ANS Task Force Update**:

ANSTF Executive Secretary Position Filled!

- Scott Newsham
  - U.S. Coast Guard representative to the ANSTF, 1998-2003
  - Retired as Commander in 2003 and has been active in environmental and educational issues in his community
  - Worked on all facets of the ANSTF – ballast water, prevention, control plans, Regional Panels, strategic plan
  - Starts on September 19, 2005

May 2005 ANS Task Force Meeting

- Hosted by the Western Regional Panel
  - Many thanks to the WRP for the presentations and the field trip
- Conditional approval of the Kansas and North Dakota State ANS Management Plans
- Addition of new members - National Park Service and Maritime Administration
- Evaluation of establishing a Nutria Working Group – recommended a scoping meeting to determine need

Ongoing ANSTF Projects

- Development of Annual Report
  - Target audience – members of Congress
- Redesign of the ANSTF web page
  - Content, appearance and accessibility
  - How can the web page serve you?
- Preliminary review of Connecticut ANS State Management Plan complete
- Asian Carp Working Group and Management Plan

Ongoing ANSTF Projects/Accomplishments

- First meeting of Detection and Monitoring Committee – March 2005
- First meeting of Research Committee – July 2005
- Preliminary review of Texas ANS State Management Plan complete
- *Caulerpa* plan published for public comment
- Risk Assessment Workshop
- Revision Process for State ANS Management Plans is nearly complete

Fall 2005 ANS Task Force Meeting

- October 19-21, 2005
- Location to be determined
- Meeting Topics
  - Annual Joint Meeting of ANSTF & Regional Panels Heads
  - Continued implementation of ANSTF Strategic Plan

Challenge to the Panels

- As always, co-chairs and members want to know how they can assist the Panels in accomplishing your respective goals
- Report of the outcome/effectiveness of joint panel meeting

She also noted that the Asian Carp Work Group is still working toward development of their "Asian Carp Management and Control Plan" and that the ANSTF is looking forward to that product. She noted that Mamie Parker, ANSTF Co-Chair has been very action oriented, and that she passes along a hello to panel members. She then directed the following question to panel members: How can the ANSTF assist in goal achievement? She said that the Panel chairpersons should come up with action items. She also noted that she would be looking forward to the outcome and effectiveness of this joint meeting. She said that the panels should come to the ANSTF meeting with a summary, highlighting the benefits and negatives of the joint meeting.

Duncan then responded to the following questions:
- What is ANSTF position right now on NAISA, and do you want anything from the panels? Duncan encouraged the panels to not stay away from it. She noted that the Panels are committees of the ANSTF, so panel recommendations should be delivered to the task force. She also noted that individual panel members can comment on their own, and she encouraged everyone to comment on various legislation from their various perspectives.
- What is the ANSTF position? She said that NAISA has never gone out to Task Force members for comment. She said we have to assume the position of the Bush administration and the agencies of the task force that we represent. She said that no attempt has been made to tackle the task force comment process yet. She said that the NAISA review will be handled through the individual agencies, not the task force. But, she said, we would welcome panel comments.

Proctor then reintroduced Robyn Draheim, who discussed Hazard Analysis and Critical Control Points (HACCP) procedures from the perspective of field researchers. He made the following points in a Power Point Presentation entitled, **Using HACCP Protocols to Prevent New Introductions - Reducing the spread of New Zealand mudsnails by field researchers**:

- Resource management work often creates open pathways that could spread invasive species to unique and critical habitats for already endangered species.
- Next to habitat loss, invasive species are resource management's biggest challenge.
- Executive Order 13112, 1998, directs agencies to prevent the spread of invasive species in their work but few management tools exist to implement this Directive.
- Hazard Analysis and Critical Control Points (HACCP) planning has been modified from the food industry for natural resource work.
- Around the world industry uses the HACCP planning tool to remove product contamination.
- In natural resource pathways, hitchhiking species are considered contaminants.
- HACCP's comprehensive planning identifies these species and the risk of contamination while documenting the best management practices used to prevent and remove hitchhikers.
- HACCP planning as a pathway management tool provides a comprehensive method to identify risks and focus procedures to prevent the spread of species through natural resource pathways.
- Natural resource work could unintentionally spread non-target (potentially invasive) species to new habitats.
- These non-targets could hitchhike on field or farm equipment, or be included in shipments of species relocated to restore range, or moved into or out of a refugium.
- Species monitoring, collections, natural resource surveys, and fish stockings are also potential pathways.

- The New Zealand mud snails (NZMS) will be used as an example for this presentation. They are excellent colonizers:
  - having parthenogenic females,
  - showing rapid population growth,
  - having omnivorous feeding habits,
  - exhibiting an operculum (used to seal the shell to resist desiccation) which facilitates long-range and between system transport,
  - are small in size and exhibit a cryptic coloration pattern making them difficult to detect in mud, vegetation, and other debris thought to be likely transport media.
- Fish & aquatic vegetation have been implicated as possible w/in stream dispersal vectors.
- There is also anecdotal evidence that NZMS may release into water column for passive downstream dispersal.
- According to the literature (Winterbourne, 1970) NZMS can remain dormant and survive desiccation for up to 50 days on a wet substratum at 20 – 25 ^{o}C.
- If improperly cleaned and dried, equipment (e.g. waders, nets, fishing gear, buckets, boots, gloves, anchors, boats, etc.) is likely to facilitate the dispersal of NZMS and other species.
- Circumstantial evidence in the West indicates that anglers may be responsible for several of the large basin to basin "jumps" in mudsnail distribution.
- The NZMS arrived in the Western U.S. ~1985-1987, being first discovered in the middle Snake River.
- Since then they have been spread via recreational water users, contaminated equip. and hatcheries, so that today they inhabit rivers, streams, lakes and estuaries in ten Western States and three national parks.
- Thus far boaters and anglers have been the primary target of education and awareness campaigns detailing the risk of spreading NZMS and proffering advice on decontamination methods (ranging from use of *Formula 409* to purchase of separate gear for each watershed).
- Another, often overlooked group of human vectors is field biologists, aquatic etc; and dwindling budgets are forcing more and more agencies to cut local crews in favor of widely traveled regional crews who have the potential of spreading ANS over longer distances.
- In fact, agency field personnel may pose an even higher risk for NZMS transport and introduction than many aquatic recreationists because they:
  - Move within habitats and from watershed to watershed very rapidly;
  - Sample in a wide variety of habitats from highly degraded sites to remote, often pristine areas, essential fish habitat, etc; and
  - Are pressed for time, sometimes inexperienced, work into dark, out for weeks at a time, have lots of gear, etc.
- It is clear that a method to sterilize gear, i.e. decontamination protocols are necessary for these field personnel. To be useful protocols need to be:
  - Effective with a short duration application,
  - Cost effective (time and money),
  - Environmentally benign
- Available protocols include the following:
  - Dwyer et al. 2003
    - Chlorine: 3000mg/L @ 60sec >>> 33% mortality
    - Copper sulfate: 100mg/L @ 60sec >>> 46% mortality
    - Hot water: 50C @ 15, 30 and 60sec >>> 100% mortality
  - Richards et al. 2004 (desiccation and freezing)
    - All NZMS died w/in 1 hour at -3C and 40C
    - On damp substratum NZMS survive at 9C for >>48hrs
  - Hosea and Finlayson 2005 (CDFG)

    - Benzethonium chloride: 1,940 mg L @ 5 min >>> 100% mortality
    - Formula 409: 50% dilution >>> 100% mortality
    - Copper sulfate: 252mg/L @ 5 min >>> 100% mortality
- But there is no one-size-fits-all solution, and at first none of the available methods were appropriate for our field crews:
  - 24-36 hour desiccation times untenable, freezers, dryers not available, large quantities of chlorine bleach hazardous, impractical and corrosive (bad for gear);
  - Long hours, no home base, packing in gear, no extra room, no chemicals, no electricity, etc. with need to disinfect many times within a single trip;
  - For some crews Copper sulfate is appealing (mix in the field) may work but some DEQ crews need to avoid metals. Benzethonium chloride may be best bet.
- The solution became use of the HACCP = Hazard Analysis and Critical Control Point.
  - The procedure was developed by Pillsbury Company;
  - The concept is built upon the seven principles identified by the National Advisory Committee on Microbiological Criteria for Foods;
  - It is widely used by the food industry as a proven and proactive process for food safety; and
  - It can be successfully adapted for use in the natural resource management -- **www.haccp-nrm.org**
- HACCP for natural resource management:
  - Planning builds a logical framework of information to weigh risks for species spread against management benefits.
  - Documentation: HACCP plan documents methods used to remove non target species and gives managers a strategic method to make consistent decisions based on identified risks.
  - Streamlined: only take steps where be most effective, the process focuses attention on *critical control points* where non-target species can be removed.
  - Evaluation: step wise process, built in decision making.
  - Adaptable: tailored for specific activity, allows for a combination of methods to be used throughout the activity
  - The same HACCP process used by industry is followed throughout the manual, except for slight changes to fit natural resource work.
- Like all good planning systems, the HACCP model developed by industry has a few basic principles that must be observed.
  - Industry formed HACCP planning teams to describe the production process, identify hazards (risks), determine where hazards can be controlled, and describe procedures to remove the hazards identified.
  - Teams set acceptable limits for activity tasks and develop documentation with the ability to verify that specified procedures were followed.

- The HACCP Planning Sequence:
  - Describing the activity (who – what – where – when – how - why);
  - Identifying potential hazards [ANS: Non-target fishes, inverts (NZMS), plants, pathogens];
  - Diagramming the flow of steps for the activity (Identify all the steps taken during activity);
  - Filling out a hazard analysis worksheet (At each step ID risks, ID controls, ID critical control points);
  - Completing the HACCP plan form.

- The integrated strategy - clean then treat using a mechanical or chemical method.
  - Physically clean all gear before leaving a site.
  - Inspect gear before it is packed for transport.
  - Select a treatment methodology based on situation.

        - Mechanical treatments are recommended because they are less expensive, more environmentally sound and may be less destructive to gear. However most physical methods require longer treatment times and often cannot be performed in the field.
        - Chemical treatments require a 5 minute soak time. Gear must be rinsed thoroughly with freshwater away from all water bodies and all soak solutions and rinse water must be properly disposed of.

- Example HACCP For Field Personnel: Hazard - plants, invertebrates, pathogens, etc. can be imported and introduced to a new sampling site.
    - *Tasks 1,2 – before leaving lab*
        - Control Measure: Inspect gear to ensure that it is as clean as possible. Should be thoroughly dry, clear of mud, plant fragments, etc.
        - Frequency: At <u>each</u> watershed, within watershed needs to be determined by crew leader.
        - Who: Everyone, crew leader should decide if gear is acceptably clean.
        - Corrective Action: Postpone sampling until gear is re-cleaned, disinfected.
        - Supporting Documentation: Yes, form to be filled out by crew leaders.
    - *Task 3 – on site*
        - Control Measure: Rinse gear (nets, buckets, boots, waders, gloves), scrub clean, especially felts, soles, insoles, laces, etc., leave no visual residue.
        - Frequency: At <u>each</u> site.
        - Who: Everyone, crew leader should decide if gear is acceptably clean.
        - Supporting Documentation: Yes, form to be filled out by crew leaders.
    - *Task 4 – at camp or hotel, or back at base*
        - Control Measure: Disinfect equipment. Hang waders and boots to dry.
        - Frequency: At <u>each</u> site.
        - Who: Everyone, crew leader should decide if gear is acceptably clean.
        - Supporting Documentation: Yes, form to be filled out by crew leaders.
    - *Task 5 – at camp or hotel, or before packing gear for weekend storage.*
        - Control Measure: Before repacking, shake and visually inspect gear.
        - Frequency: At <u>each</u> site.
        - Who: Everyone.

To learn more about HACCP plans for natural resource management go to http://haccp-nrm.org/
To obtain a copy of the HACCP protocol for field personnel send an email to draheim@pdx.edu.

There were no questions.

MRBP Vice Chairperson Hoff and WRP Chairperson Ellis then gave a Power Point Presentation summarizing recommendations of the panels regarding joint panel actions. The following recommendations were made:

- **Risk Assessment Workshop -** Plan and convene Risk Assessment Workshop.
- **Saltcedar -** Determine if an adequate website exists on saltcedar, and develop a website if needed.
- **100th Meridian Boater Survey -** Extend 100th Meridian boater survey to states east of the meridian.
- **Classroom Programs -** Develop a policy on classroom programs including live release of organisms, how *Habitattitude*^{TM} might be integrated, and submit policy to the ANSTF.
- **Coast Guard Auxiliary -** Brief them, as invited, and provide packages of outreach materials.

- **Stock Recruitment Models -** Develop a list of species of common concern, and provide expertise to develop models.
- **Injurious Species Listing -** Develop and maintain lists of state-regulated species, add to Panel websites, and provide data and recommendations to FWS that will assist in injurious wildlife listings.
- **Interpanel Communications -** Panel EXCOMs should communicate on activities, issues, and species of common concern.
- **Aquatic Animal Species Control -** Develop a more organized effort on how to control aquatic animal species, including development of a control symposium/workshop.
- **AIS Control Database -** Review what is being done, where, how and by whom.
- **Experts Database -** Integrate with USGS data base on species.
- **Global warming -** A risk assessment may be needed.
- **Survey Needs on Shared Waters -** Coordinate baseline (ecological) survey needs on shared waters.
- **Tribal Involvement -** Improve tribal involvement by developing a model for panel use.
- **Shared Resource Priorities -** Coordinate on research priorities for shared waters.

Proctor thanked everyone for participating and the meeting adjourned at 5:00 p.m.

Western Regional Panel/Mississippi River Basin Panel (MRBP)
on Aquatic Nuisance Species (ANS)
Joint Meeting

Wichita, KS

September 7-9, 2005

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