A Report to the Aquatic Nuisance Species Task Force for 2011 - 2012

Summary

The mission of the Mid-Atlantic Panel (MAP) is to assist state and federal agencies and other stakeholders in developing and implementing strategic, coordinated, and action-oriented approaches to prevention and control of aquatic invasive species (AIS) in the mid-Atlantic region. The driving force behind the Panel's mission is to strengthen cooperation, coordination, and communication on AIS issues within the region and beyond.

The Panel conducts an annual small grants competition to fund on-the-ground activities addressing MAP's mission and regional priorities. There is particular interest in vector management. Since 2007, the Panel has awarded nearly a quarter million dollars leveraging over half a million dollars in partner funds (Attachment 1).

The MAP met twice in 2011 with the spring meeting held May 18-19 at the National Wildlife Visitor Center in Laurel, Maryland. Projects selected for 2011 funding at this meeting targeted nutria, beach vitex, and Asiatic sand sedge eradication and the mapping of invasive species in the Ohio River Basin (Attachment 2). The fall meeting was held October 5-6 at the National Conservation Training Center in Shepherdstown, West Virginia. Tim Schaeffer of the Pennsylvania Fish and Boat Commission discussed the broad challenges of Asian carp management. Professors Zachary Loughman of West Liberty University and Tom Jones of Marshall University presented their research on non-native crayfish of significant concern in West Virginia. The important results of the first telemetry study conducted for rusty crayfish in the central Appalachian region were also highlighted. Professor Loughman was an enthusiastic guest presenter again at the spring 2012 ANSTF meeting, hosted by the MAP, in Annapolis, Maryland.

Focus Areas and Key Strategies

A major outcome of the fall 2011meeting was the updating of MAP funding priorities for the 2012 RFP:

1) **Identify and evaluate AIS educational efforts (general public and in schools) in the U.S. and in other countries**

Through increased travel and world trade, the number of AIS introductions continues to increase year by year, and public awareness of the impact from those species is little more than 2%.[1] There have been many AIS educational programs developed to tackle this topic, but relatively few studies to evaluate the effectiveness of such campaigns and develop best practices or recommendations for educational efforts. What successful public educational/awareness efforts are underway in other parts of the world? Has their effectiveness been demonstrated and how? Could they be piloted in the mid-Atlantic region to strengthen public awareness and support to slow AIS introductions?

2) Develop educational materials for K-12 classroom education

Control and prevention of AIS requires a major change in human behavior surrounding non-native aquatic species. Mainstreaming AIS education into K-12 classrooms ensures children will learn responsible prevention early in life, and spread this knowledge to their communities. Environmental education in AIS is also a subject that encourages the place-based, problem-solving, field activities that are so important to K-12 education. MAP is interested in the development and implementation of lesson plans, textbook chapters, teacher development training, and other educational materials that reflect the standards set by the States and will broadly reach K-12 students in the mid-Atlantic.

3) Develop and distribute social marketing products to educate the general public

The MAP would like to support the development of creative, innovative, and effective social marketing products for AIS prevention and control in the mid-Atlantic. The MAP is especially interested in coupling these products with an evaluation of their effectiveness in educating and changing the behavior of the public.

4) Build on current regional efforts in early detection and rapid response (EDRR)

In early 2009, MAP and Maryland Sea Grant completed a regional rapid response plan with funding from the National Oceanic and Atmospheric Administration. The plan emphasizes an Incident Command System approach to help initiate a synchronized response in the event of a new invasion in a state or watershed in the mid-Atlantic region. For more information visit: http://www.mdsg.umd.edu/images/uploads/siteimages/invasive_species/6_Stopping_the_spread.pdf. Proposals are encouraged that further expand activities to strengthen EDRR efforts.

5) Continue to develop vector management strategies for states and the region

In late 2009, MAP co-sponsored a workshop with Maryland Sea Grant on vector management as a mechanism to prevent introductions of invasive species. Recommendations from the workshop included improving management of ship fouling and live bait as well as addressing other ship and live trade pathways (http://www.mdsg.umd.edu/issues/restoration/non-natives/workshop09/). Proposals are encouraged that develop mechanisms for states and the region to pursue vector management options.

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1 Helmholrz Centre For Environmental Research – UFZ (2009). Invasive Species: Will Europe At Last Unite To Combat Thousands of Alien Invaders? http://www.sciencedaily.com

6) **Encourage states to develop and implement AIS management plans**
The MAP recognizes that state management plans can provide a catalyst for state and federal funding and resources. There is continued interest in funding proposals contributing to plan development and implementation.

Three projects tackling these issues were selected at the spring meeting held May 1, 2012 in Annapolis, Maryland to receive Panel funding (Attachment 3).

The fall 2012 meeting was hosted by the NC Department of the Environment and Natural Resources in Raleigh, North Carolina on November 7, 2012. Dr. Randy Westbrooks of Invasive Plant Control Inc. presented his seven step process for building EDRR capacity and the SCC Invasive Species Management Program - an online invasive species training program for field professionals. Additional guest speakers delivered interesting talks on hydrilla biology and multi-faceted management approaches.
MAP meeting minutes are available at http://www.midatlanticpanel.org/events/mma.htm.

Issues of Concern

MAP is contributing 2012 funds for co-sponsorship of the International Didymo Conference being held in Providence, Rhode Island on March 12-13, 2013. The conference is being organized by the Invasive Species Action Network based in Livingston, Montana.

Didymo, (*Didymospheria germinata*) or "Rock Snot" is an invasive alga of cold flowing waters. Individual didymo organisms are microscopic, but infestations include enormous numbers, and each individual produces a long stalk from the stream bottom. The resulting mass is a yellow-brown slime layer that can dominate the rivers and streams. Didymo infestations in North America are sufficiently new so scientists can only guess at the long-term ecological consequences, but dramatic changes in stream biology have been verified. Didymo is extremely unsightly and makes waterways unattractive to recreational users. Tragically, the list of places infected with the rapid spread of didymo reads like a catalog of the finest fly-fishing waters on the planet. Resources managers in North America, and especially in New Zealand, concluded early on that the felt-soled waders and boots of traveling fly fishermen were the likely pathway for its spread. Subsequent field and laboratory studies demonstrated that the felt sole is an almost perfect medium for its spread. Didymo has spread nationwide including the Chesapeake Bay. To further thwart infestation, Maryland in 2011 banned such gear being worn in its waters.

The International Didymo Conference will feature updates on biological parameters, invasive bloom mechanisms, prevention strategies, new control techniques, and success stories. Ultimately, the main goal is to foster a better understanding and improve management knowledge of this invasive species.

Accomplishments & Highlights

In 2011, MAP participated in outreach and publicity efforts resulting in enhanced stakeholder awareness and a more recognized presence in the AIS community:

- A pilot AIS award program was initiated to recognize individuals and institutions for commitment and achievement in thwarting AIS. The 2011 MAPAIS Rachel Carson Award recipient is the New Jersey Conservation Foundation and the Certificate of Merit recipients are the Virginia Department of Conservation and Recreation and the Perkiomen Watershed Conservancy (Attachment 4).

- Poster presentation, *The Mid-Atlantic Panel on Aquatic Invasive Species – A Regional Panel of the Aquatic Nuisance Species Taskforce* was given at the first ever FWS Northeast Region Biologists Conference in Baltimore, MD, February 14-18, 2011 (Attachment 5).

- MAP Coordinator presented *The Mid-Atlantic Panel on Aquatic Invasive Species – Partnership with Purpose* at the Virginia Phragmites Manager's Coordination Workshop held at the Virginia Institute of Marine Science in Gloucester Point, VA on May 26, 2011.

MAP successfully conducted its small grants program in 2011 and 2012, awarding funds for six consecutive years now:

- *Pennsylvania's Field Guide to Aquatic Invasive Species,* an attractive and consistent resource for identifying, collecting, and reporting AIS in Pennsylvania, is now available to the public. This publication, to also benefit other states within the mid-Atlantic region, was supported by a 2009 MAP grant: http://www.paseagrant.org/projects/pennsylvanias-field-guide-to-aquatic-invasive-species/.

- Made possible with a 2010 MAP grant, the *Pocket Guide to Mid-Atlantic Water Garden Species* and instructional DVD featuring plant inspection and cleaning videos among other education tools were completed in 2012. 87% of Master Gardeners and Cooperative Extension Coordinators rated materials as "Very Good" or "Excellent": http://www.paseagrant.org/projects/pennsylvanias-field-guide-to-aquatic-invasive-species/.

- 80% of all projects awarded MAP funds have been completed. MAP Small Grants Program 2007-2011 Final Reports booklets were given to ANSTF co-chairs at the November 2012 meeting. An electronic copy is available upon request.

The Panel continues to develop and encourage collaboration and coordination on vector management issues within the Mid-Atlantic and beyond. Dr. Fredrika Moser presented an overview of the 2009 AIS regional vector workshop at the joint MRBP and GSRP meeting in New Orleans, Louisiana on October 10, 2012 (Attachment 6).

Attachment 1. MAP Small Grants Program-Project Inventory 2007-2012

Title	Lead	Benefit	Focus	Match	Request	MAP	Final Report
2007: Biological Control and Nutrient Enrichment of Purple Loosestrife: Investigating the Effectiveness of Purple Loosestrife Control using *Galerucella calmariensis*	Walter P. Carson, Ph.D. walt@pitt.edu	Site surveys in PA, NY, and Ohio. Increased biocontrol efforts effective in low N soil. Decreasing nutrient input in invasion prone and high conservation sites will improve overall biocontrol success.	Control	$0	$9,967	$9,967	Yes; Carson, W.P., S.M. Hovick, A.J. Baumert, D.E. Bunker, and T.H. Pendergast. 2008. Evaluating the post-release efficacy of invasive plant biocontrol by insects: a comprehensive approach. Arthropod-Plant Interactions.
2007: Conducting an Aquatic Invasive Species Early Response Exercise in Pennsylvania	Sarah Whitney swhitney@psu.edu	Interagency workshop addressed policies, staffing, coordination, and communication, improving AIS rapid response planning.	EDRR	$8,638	$11,655	$11,655	Yes
2007: Current and projected distribution of the invasive rusty crayfish, *Orconectes rusticus*, in the Upper Susquehanna River basin	Thomas Horvath, Ph.D. horvattg@oneonta.edu	Invasive rusty crayfish population data collected and mapped for portions of the Susquehanna River basin. Data to be loaded to USGS database.	Map	$13,603	$9,870	$9,870	Yes
2007: Aquatic Invasive Species Prevention Signs for Pennsylvania Waters	Sarah Whitney swhitney@psu.edu	Consistent/one sign design created for use at all boat launches across the state. PA DCNR and FBC have agreed to use the signs. Local groups have expressed interest for private and community postings.	Outreach	$2,746	$10,195	$10,195	Yes
2008: Survey and Eradication of water chestnut on Delmont Lake	Crystal Gilchrist cgilchrist@perkiomenwatershed.org	Water chestnut surveys & control measures in partnership w/ local community. Outreach via various outlets.	Control	$35,532	$9,031	$9,031	Yes

2008: Tracking Invasive Species in Pennsylvania	Jeffrey Wagner jwagner@paconserve.org	Comprehensive dataset developed for tracking AIS in PA, existing AIS datasets inventoried and incorporated, geographic data entered into iMapInvasives.	Map	$17,542	$9,800	$9,800	Yes
2008: Aerial GPS Census and Mapping of Phragmites in Virginia	Kevin Heffernan kevin.heffernan@dcr.virginia.gov	Aerial surveys conducted with GPS data resulted in accurate and comprehensive documentation of Phragmites distribution in key Ches Bay shoreline areas; maps integrated with ArcIMS webtool & VA Phrag Mapping Application	Map	$12,000	$10,000	$10,000	Yes
2008: Publication and Targeted Dissemination of AIS Prevention Literature in Pennsylvania	PA Fish& Boat Commission	Printed education material targeting specific AIS species & issues -disseminated by the agency's Waterway Conservation Officers.	Outreach	$140,635	$9,989	$9,989	Yes
2008: Maryland Department of Natural Resources Invasive Species Matrix Team	Sarah Widman swidman@dnr.state.md.us	Increasing AIS awareness targeting species that are not yet widespread in MD, but identified in portions of the state or Ches Bay watershed. Creation of signs for waterways or trailheads with instructions for reporting AIS to MDNR.	Outreach	$7,550	$7,000	$1,100	Yes
2009: Estimating risk of fish invaders in the Mid-Atlantic region	Paul Angermeier, Ph. D. biota@vt.edu	Prediction models for potential fish invaders based on species and drainages characteristics.	EDRR	$5,850	$10,000	$10,000	Yes, dissertation; contact PI for publication details
2009: Pilot Project for Data-Driven Nutria Study and Removal from Nags Head Woods Ecological Preserve	Aaron McCall amccall@tnc.org	Documentation and mapping of existing nutria population density with special focus on points of entry in and around the Preserve. Data collected used for Nutria Control Management Plan for NHW. Public outreach using brochures, signage.	Map	$4,484	$9,830	$9,830	Yes

2009: Coordination of Regional Monitoring Network and Implementation of Web-based Reporting System to Determine Status of the Chinese Mitten Crab in Chesapeake Bay, Delaware Bay, and the Mid-Atlantic Coast.	Gregory Ruiz, Ph. D. ruizg@si.edu	Increased understanding of current distribution of Chinese mitten crab in Eastern US, and whether self -sustaining populations are present through development of web-based reporting system.	Map	$0	$7,000	$7,000	Yes
2009: Aquatic Invasive Species Field Guide for Pennsylvania	Sara Grise` sng121@psu.edu	A consistent and clear resource developed for identifying, collecting, and reporting on AIS in PA.	Outreach	$27,767	$10,000	$10,000	Yes; field guide
2009: Outreach Regarding Virginia's Phragmites Invasion	Kevin Heffernan kevin.heffernan@dcr.virginia.gov	Provided current VA Phragmites abundance & distribution, negative environmental & economic impacts, management landowner workshops, presented at professional conferences, & peer reviewed publication.	Outreach	$13,000	$12,000	$3,000	Yes
2010: Early Detection and Rapid Response to Protect Crow's Nest and Dragon Run Marshes from Invasion by Phragmites Australis	Kevin Heffernan kevin.heffernan@dcr.virginia.gov	Protection of two of coastal VA's most pristine tidal marshes from non-native Phragmites invasion by controlling 10 acres of recently detected infestation.	Control	$5,000	$10,000	$10,000	DUE
2010: Years 2 and 3 - Survey and Eradication of Water Chestnut on Delmont Lake	Crystal Gilchrist cgilchrist@perkiomenwatershed.org	Continuation of efforts to remove water chestnut from Delmont Lake.	Control	$14,620	$14,569	$7,100	Yes
2010: Invasive Carp Removal Project	Tim Morris tim@njconservation.org	Successful eradication of invasive carp from impoundments of Wickecheoke Creek (a Delaware River tributary). Project also resulted in eradication of first known introduction of invasive Chinese pond mussel in North America.	Control	$21,970	$4,000	$4,000	DUE

2010: Water Chestnut Eradication in the Sassafras and Bird Rivers	Mark Lewandowski mlewandowski@dnr.state.md.us	Eradication and control measures and rapid response plan for water chestnut in the Bird and Sassafras Rivers. Outreach to local citizen groups.	Control	$3,512	$7,718	$2,980	Yes
2010: A rapid survey for a new introduced species of shrimp in the Chesapeake Bay	Robert J. Diaz, Ph. D. diaz@vims.edu	Rapid surveys for Oriental Shrimp in the York River. Surveys complemented previous efforts in James River and MD western shore tributaries.	EDRR	$5,437	$5,440	$5,440	DUE
2010: Social marketing strategies to reduce nonnative bait introductions	Kerrie Kyde kkyde@dnr.state.md.us	Project cancelled due to limited participation.	Outreach	$24,305	$10,000	$5,000	N/A
2010: Creating Water Gardening AIS Prevention Training in Pennsylvania	Diane Oleson djo13@psu.edu	Education package for use with and by Penn State Master Gardeners, Extension Educators, and the public for preventing the spread of AIS through water gardening.	Outreach	$3,149	$7,980	$7,980	Yes; materials
2011: Beach Vitex Eradication Program in Virginia Beach	Charles McKenna cmckenna@vbgov.com	Eradication and control of beach vitex in the greater Virginia Beach area; mapping distribution for monitoring program.	Control	$8,776	$6,000	$6,000	2013
2011: Invasive sedge control and native species restoration at Island Beach State Park, Ocean County, New Jersey	Louise Wootton, Ph. D. woottonl@georgian.edu	Control & monitoring program for Asiatic sand sedge focused on coastal sand dunes with scheduled herbicide treatment, and native replantings.	Control	$55,600	$15,000	$15,000	2013
2011: Support for a Nutria Eradication Program in Virginia	Scott Klopfer sklopfer@vt.edu	Knowledge of current nutria population distribution to support eradication strategies. Coordination of interagency efforts.	Map	$10,753	$14,947	$14,947	Yes

2011: Mapping Invasive Species Distribution in Selected Areas of the Ohio River Basin	Jane Konrad konrad@pitt.edu	Training of teachers/ educators in the Ohio River basin to ID and map AIS with their students. Data collected to be processed & shared w/ regional databases, state agencies, & others.	Map	$6,000	$14,800	$14,800	Yes
2012: The Good, the Bad and the Ugly: An Invasive Species Toolkit for Educators	Kerry Wixted kwixted@dnr.state.md.us Britt Slattery bslattery@dnr.state.md.us	Engage public about their role in invasive species reduction. Toolkit creation for both formal classrooms &non-formal settings; multiple grade levels.	Outreach	$33,330	$14,900	$10,000	2015
2012: Development of a West Virginia Invasive Species Management Plan	Walter Kordek waltkordek@wvdnr.gov	Development of comprehensive statewide aquatic and terrestrial invasive species plan that will include education, prevention, early detection, inventory, various treatment methods, monitoring, and restoration.	Control	$16,729	$15,000	$13,000	2015
2012: Development of a Strategic Plan for Eradicating Established Nutria Populations in Virginia and North Carolina	Scott Klopfer sklopfer@vt.edu Michael St. Germain mstgerma@vt.edu	Development of a strategic plan that will provide specific details on actions, resources required, and procedures for controlling nutria. Ultimate goal is to estimate costs of implementation and eradicate nutria within the Chowan-Roanoke and Lower Chesapeake hydrologic subregions in VA and NC.	Control	$12,917	$14,996	$10,000	2015
			TOTAL:	**$511,445**	**$291,687**	**$247,684**	

2011 Small Grants Program

Support for a Nutria Eradication Program in Virginia

Project Lead and Co-Participants:

- Co-Leads: Scott D. Klopfer and Rebecca Schneider, Conservation Management Institute
- Co-participants: David Bishop, US Fish and Wildlife Service
- Mike Fies, Glen Askins and Aaron Proctor, Virginia Department of Game and Inland Fisheries
- Scott Barras, US Department of Agriculture Wildlife Services

The nutria (*Myocastor coypus*), or coypu, is listed as a nuisance species in Virginia. The current distribution of nutria in Virginia is unknown. At minimum, nutria are considered established in an area bounded by the intersection of Route 13 and Interstate 264 south to the North Carolina state line and east to the Atlantic Ocean. The overall goal of this project is to establish the current distribution of nutria in Virginia to support subsequent eradication activities. This will be accomplished by completing a number of tasks that will establish the current distribution of nutria in Virginia, implement a standard inter-agency reporting process for observations, and produce a report on the status of nutria in Virginia to guide future efforts to eradicate them. The objectives of this project are:

1. to design and implement a standard inter-agency reporting process for nutria in Virginia,

2. to establish the current distribution of nutria in Virginia,

3. to establish a multi-agency panel to guide development of a nutria eradication plan, and

4. to publish a report on the status of nutria in Virginia with preferred options for future eradication efforts.

Beach Vitex Eradication Action Plan for Virginia Beach

Project Lead and Co-participants:

- Charles McKenna, City of Virginia Beach, ESO
- Lee Rosenberg, Beach Vitex Task Force Virginia Coordinator
- Larry Nichols, Virginia Department of Agriculture and Consumer Services, Plant Industry Services
- Susan French, Virginia Tech Cooperative Extension

- David Bishop, U.S. Fish and Wildlife Service

Beach vitex (*Vitex rotundifolia*) is an invasive plant found in sand dunes from Georgia to Maryland. Beach vitex alters the structure and function of the sand dune ecosystem, creating monocultures, affecting sea turtles, and enhancing erosion. Beach vitex was recently discovered in southeastern Virginia. This project represents and early detection and rapid response plan to treat existing plants in Virginia.

This project is focused on locating and treating invasive beach vitex in the greater Virginia Beach area. Objectives for this project are to:

a) locate and map beach vitex
b) treat beach vitex with herbicide.

Using a database for known plants with their progress and later record any newly discovered areas will greatly contribute to our eradication efforts of the beach vitex population.

Invasive sedge control and native species restoration at Island Beach State Park, Ocean County, New Jersey

Project Lead and Co-Participants:

- Louise Wootton PhD, Georgian Court University
- Mark Pitchell, Superintendent, Island Beach State Park,
- Becky Hedden, Naturalist, Island Beach State Park
- Rita Carey, Friends of Island Beach State Park, Inc

The proposed project will control Asiatic sand sedge (*Carex kobomugi*) and restore native vegetation in coastal dune areas at Island Beach State Park (IBSP). Significant expanses of dune and beach along the New Jersey coast support federally listed (threatened) species such as piping plover (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*). However, invasive species such as Asiatic sand sedge are reducing habitat viability for these and other dune/beach dependent vegetation and wildlife. Asiatic sand sedge was first reported in New Jersey at IBSP in the late 1920s (Small 1954) and was already spreading rapidly by the middle of that century (Martin 1959). The area of dune occupied by this species is currently expanding exponentially (Wootton et al. 2005).

Once established, sand sedge out-competes native vegetation including seabeach amaranth and forms extensive, dense stands, reducing habitat viability for beach-nesting wildlife. This reduces plant community diversity in affected areas which, in turn, reduces the resiliency of the ecosystem to changing environmental conditions and other stressors. The species also changes dune morphology, resulting in reduced protection of inland areas from storm surges. Island Beach State Park, which today has more than 50 acres of dunes infested by the sedge, is believed to be the source for the numerous other populations that have become established on coastal dunes throughout US

Northeast, both through natural propagation and deliberate plantings made from the 1960s to the 1980s.

To restore the project area, the following steps are proposed: (1) application of glyphosate, to Asiatic sand sedge during Fall 2011; (2) application of additional herbicide treatment to persistent, residual areas of Asiatic sand sedge during Summer and Fall 2012; and (3) planting a mix of native vegetation in areas where control has been successful including, but not limited to "Cape" American beach grass (*Ammophila breviligulata*), "Avalon" saltmeadow cordgrass (*Spartina patens*) and "Atlantic" coastal panicgrass (*Panicum amarum* var. *amarulum*). Elimination of dense stands of Asiatic sand sedge and re-establishment of native vegetation will improve habitat quality for beach-nesting wildlife and federally listed species by increasing native plant abundance, invertebrate production, and habitat heterogeneity.

Mapping Invasive Species Distribution in Selected Areas of the Ohio River Basin

Project Lead and Co-Participants:

- Jane Konrad, University of Pittsburgh
- Creek Connections (CC), Allegheny College, Meadville, PA

This project will offer four professional development opportunities for teachers in the Ohio River Basin. The initial workshop for teachers will introduce the AIS project as a component of the Allegheny College Creek Connections program and will prepare the teachers to conduct stream research with their students to identify and map the presence of Aquatic Invasive Species in their watershed. PRCST will use the results of this workshop to map and prepare the data collected along with related materials for distribution and publication. Alignment with academic standards will be identified for other teachers/schools interested in integrating the project/results into their curricula. A final workshop for teachers will be held in August 2012, where participants will join those teachers/schools participating in the CC Program for the coming year. This will serve to stimulate understanding and interest in the AIS study and to broaden awareness of AIS issues and status.

Presentations will be made at local, regional and state conferences such as the Pennsylvania Association of Environmental Educators (PAEE). Project information will be sited on regional and state websites, e.g. Pittsburgh Regional Center for Science Teachers (PRCST), Creek Connections, Allegheny College, Pennsylvania Center for Environmental Education (PCEE), and PAEE. Project information will be included in the PRCST online newsletter, LASER, and the Creek Connections newsletter, LINK.

2012 Small Grants Program

The Good, the Bad and the Ugly: An invasive species toolkit for educators
Project Leads: Kerry Wixted and Britt Slattery, Maryland Department of Natural Resources

Most people are not aware of how our natural resources, human health, and economy are affected by invasive species. If we are to effectively combat these threats to our environment and our lifestyles, we must find more effective ways to engage the public in understanding their role in causing and reducing the spread of invasive species. DNR will develop a set of educational resources (a "toolkit") on the problems and solutions regarding invasive species, particularly in the mid-Atlantic states. The project will provide:

- Information, hands-on artifacts and other tools for use with students in multiple grade levels;
- Lesson ideas for incorporating invasive species topics into a variety of educational disciplines, both in formal classrooms as well as in non-formal settings such as outdoor education centers, after-school and community programs;
- Correlation to Maryland environmental literacy and common core learning standards, National science standards, and STEM (Science Technology Engineering and Mathematics) goals;
- Suggestions for student and community monitoring and action projects;
- Teacher/ environmental educator professional development to assure effective development and delivery.

As a result of the project:

- Students, educators, and community members will be better educated on the ecological, economical and human health impacts of invasive species, how they occur and spread, and how people can help;
- Program audiences (educators and their students, and eventually the broader community) will receive the information and encouragement they need to serve as stewards of our environment regarding invasive species. One way is by delivering the message to others about helping to stem the tide of invasives introduction and spread, which can be incorporated as a student action and leadership project into a variety of learning disciplines. Students will also be encouraged to participate in or lead action projects that include invasives removal or monitoring of invasive species in their communities.
- Increased awareness will ultimately help reduce spread and prevent future invasions.

Development of a West Virginia Invasive Species Management Plan
Project Lead and Co-Participants:

- Walter Kordek, WV Division of Natural Resources
- Kent Karriker, Monogahela National Forest
- Michael Powell, The Nature Conservancy
- Sherrie F. Hutchinson, WV Department of Agriculture
- Robert Radspinner, WV Division of Forestry

Aquatic and terrestrial nuisance species are a significant threat to the biodiversity and natural resource-based economies in the Appalachian region. West Virginia relies heavily on forest products, agriculture, and natural resource-based tourism and recreation. The wood products industry in West Virginia exceeds $4 billion annually and accounts for nearly 30,000 jobs (Childs 2005). Wildlife associated recreation in West Virginia, such as hunting, angling, and wildlife watching generates over $1.2 billion in total economic impact for the state (USDI and USDC 2006). Currently, there is little coordination between agencies, private landowners, and other organizations that are engaging in nuisance species control efforts. There is no single authority responsible for coordination or information sharing, nor is there a legislative mandate or funding for coordination or cooperation.

To address these issues, the West Virginia Division of Natural Resources proposes to hold a series of meetings throughout the state to engage federal, state, and local agencies, community associations, academia, businesses, and non-profit organizations in the development of a comprehensive statewide aquatic and terrestrial invasive species plan. This plan will include all aspects of integrated pest management including education, prevention, early detection, inventory, various treatment methods, monitoring, and restoration. The goal is to implement a coordinated approach to minimizing the ecological, socioeconomic, and public health impacts of nonnative invasive species in West Virginia.
The primary activities that will be employed through this grant will fall into three broad categories including:
a. Developing a shared vision among partners for the statewide plan by facilitating meetings and summarizing findings;
b. Completion of a comprehensive statewide plan that has been reviewed and approved by partners including the Aquatic Nuisance Species Task Force;
c. Informational meetings and briefings with the governor and staff about the threat of NNIS and the importance of implementing the state plan; and
d. Outreach with the public to increase support for the completed plan and to engage additional stakeholders.

Development of a Strategic Plan for Eradicating Established Nutria Populations in VA and NC

Project Leads and Co-Participants:

- Scott Klopfer and Michael St. Germain, Conservation Management Institute Virginia Tech
- David Bishop, US Fish and Wildlife Service
- Mike Fies, VA Department of Game and Inland Fisheries
- Scott Barras and Todd Menke, US Department of Agriculture Wildlife Services
- Colleen Olfenbuttel, NC Wildlife Resources Division

The nutria (*Myocastor coypus*), or coypu, is listed as a nuisance species in Virginia and North Carolina. Recently these states have been coordinating efforts to control and manage nutria populations. Nutria eradication is difficult, but recent successes in the Chesapeake Bay have demonstrated that nutria populations can be eradicated. Successful control requires the development of a strategic plan that can address both logistical and technical aspects of eradication. Further, a plan that provides a well-conceived and efficient strategy will increase the likelihood of receiving the substantial funding that would be required for successful eradication. This project will develop a strategic plan for eradicating nutria through collaboration among natural resource management agency stakeholders and the application of knowledge gained from the ongoing Chesapeake Bay Nutria Eradication Program. This plan will provide specific details on actions, resources required, and procedures for controlling nutria in these areas.

The primary task associated with adapting the CBNEP strategic plan to VA-NC will be to identify where strategies need to be modified to address specific situations in these states. Some of the issues that will require detailed review and discussion include accessing private lands, applying existing resources and information, communicating with the public. While this plan will not provide comprehensive details on the operational aspects of nutria management, it will include specific information on how monitoring and eradication efforts should be carried out so that the costs of these efforts can be accurately estimated. Estimates of effort, time, equipment, etc. will be based on the best information available from the CBNEP (and other similar efforts). We will convene regular meetings of the steering committee to direct this process. This group will be tasked with providing input for refining the objectives, and for making decisions on approach, and finalizing strategies. The group will also be able to provide information on existing programs and/or capabilities within their respective organizations that can be applied to the eradication effort. Finally, the costs for the overall approach can be estimated in order to provide realistic scenarios for identifying and securing funding for the program. This project would be completed with a series of tasks:

Task 1. – Review existing CBNEP strategic plan to identify any modifications to goals and/or objectives for VA and NC.

Task 2. – Examine each goal and determine if it is applicable to the VA-NC nutria population or effort and modify as necessary to address specific needs. Where necessary, formulate additional goals to ensure the best possible result with the information available.

Task 3. – Examine objectives for each of the goals and modify as necessary. Examine each strategy and ensure that the approaches are applicable, based on the best available information, and are sufficiently detailed to identify potential obstacles and ways to address them.

Task 4. – Draft the strategic plan for the VA-NC area and circulate to a wide network for comment and review. Make sure to include specific outreach to the public through media and civic groups.

Task 5. – Discuss and integrate feedback as appropriate. Finalize the strategic plan and develop cost estimates for implementation.

While this approach is ambitious we feel the efforts of the CBNEP can provide the foundation necessary to move through this process more rapidly and effectively and for much less cost. The resulting strategy will be used to demonstrate the likelihood of success for a fully implemented eradication program. The ultimate goal is to eradicate nutria within the Chowan-Roanoke and Lower Chesapeake hydrologic subregions in Virginia and North Carolina.

FOR IMMEDIATE RELEASE

Date: July 6, 2011
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Virginia Department of Conservation & Recreation

News Release

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DCR recognized for efforts to control invasive Phragmites

RICHMOND — The Virginia Department of Conservation and Recreation has been recognized by the Mid-Atlantic Panel on Aquatic Invasive Species (MAP-AIS) for efforts to control Phragmites, a tall, wetland grass species classified as invasive in Virginia and the rest of the United States.

DCR's Natural Heritage Program received a certificate of merit in the panel's first-ever Rachel Carson Awards program. The program was established to recognize individuals and organizations that demonstrate commitment to and progress in thwarting aquatic invasive species.

"DCR has worked hard to form strong partnerships in the battle against invasive species," said Tom Smith, DCR's Natural Heritage director. "From the Virginia Native Plant Society beginning in the early 1990s, the list of active partners has grown too long to easily list. However, all are critical in efforts to inform the public, take active measures to keep out the most invasive species not yet here, and to strategically manage widespread invasives, such as Phragmites, from our most important marshes."

Nominees for the awards were evaluated on several criteria related to their efforts to combat invasive species. The criteria included strategies used to educate the public, the development of new or expanded technologies, and success in limiting the abundance of an exotic, invasive or "nuisance" species.

"Through its small grants program, the panel has supported Natural Heritage's proactive and holistic approach to managing Phragmites," said Lisa Moss, coordinator of the MAP-AIS. "The staff's dedicated and consistent efforts reflect the Rachel Carson spirit and attest to the

important work being done in the Mid-Atlantic region to ensure the protection of our valuable wetlands."

During the last 50 years, Phragmites has become increasingly abundant along the East Coast. DCR staff has mapped more than 12,000 acres of the grass in coastal Virginia. In Back Bay, 6,000 acres occupy 10,000 acres of wetland habitat.

Phragmites overwhelms other marsh plant species from above and below ground. Tall stems can grow up to 15 feet. Fast-growing underground stems form new shoots and thick, tangled root mats. Phragmites clogs drainage ditches, invades agricultural fields and offers little habitat for wildlife.

"Phragmites is like the kudzu of our wetlands," said Kevin Heffernan, a DCR stewardship biologist who works on the Phragmites-control program. "It replaces native marsh vegetation, reducing habitat for birds and waterfowl, and it reduces property values by obstructing water views. It also increases wildfire hazards and provides ideal breeding habitat for mosquitoes.

"Once established, Phragmites requires several years of herbicide treatments to control."

As a prize for being recognized, the Natural Heritage program received a new Garmin GPS unit, which staff will use to map invasive plants across the state. The unit came courtesy of the U.S. Fish and Wildlife Service Virginia Fisheries Coordinator Office.

Virginia's Natural Heritage program began in 1986 and celebrates its 25th anniversary this year. The mission of the program is to conserve Virginia's biodiversity through tightly integrated activities of biological inventory, database management, land protection and ecological stewardship.

Phragmites is featured in a new 12-page educational booklet and on a classroom-friendly poster developed by the Natural Heritage program and Virginia's Invasive Species Working Group. To view these materials, visit www.vainvasivespecies.org. To request materials, email julie.buchanan@dcr.virginia.gov.

MAP-AIS also awarded a certificate of merit to the Perkiomen Watershed Conservancy in Pennsylvania for its efforts to eradicate the European water chestnut. The New Jersey Conservation Foundation received the Rachel Carson Award for initiatives to combat bighead carp.

The Mid-Atlantic Panel on Aquatic Invasive Species

A Regional Panel of the Aquatic Nuisance Species Task Force

Marion L. Moss
Virginia Fisheries Coordinator Office, Charles City, VA

Introduction

The Aquatic Nuisance Species (ANS) Task Force is an intergovernmental organization dedicated to the prevention and control of aquatic nuisance species and the implementation of the Nonindigenous Aquatic Nuisance Prevention and Control Act (NANPCA) of 1990. The various NANPCA mandates were expanded later with the passage of the National Invasive Species Act (NISA) in 1996. The Task Force consists of 13 Federal agency representatives and 12 ex-officio members, and is co-chaired by the U.S. Fish and Wildlife Service (FWS) and the National Oceanic and Atmospheric Administration (NOAA). The Task Force coordinates efforts in the U.S. with those of the private sector and other North American interests via the Regional Panels (Great Lakes, Gulf of Mexico, Mississippi River Basin, Western, Northeast, Mid-Atlantic) and issue specific standing committees.

Established in 2005, the Mid-Atlantic Panel on Aquatic Invasive Species (MAP) is composed of individuals from state and federal agencies, regional entities, private and commercial organizations, and academic institutions. Eight states (Delaware, Maryland, North Carolina, New York, New Jersey, Pennsylvania, Virginia, West Virginia) and the District of Columbia are represented on the Panel. The mission of the MAP is to assist state and federal agencies and other stakeholders in developing and implementing strategic, coordinated, and action-oriented approaches for aquatic invasive species (AIS) prevention and control in the Mid-Atlantic region. Our driving force is to strengthen cooperation, coordination, and communication on AIS issues within the Chesapeake Bay watershed and beyond.

Funded in part by MAPAIS, the AIS regional workshop, *Vector Management: A Prevention Solution*, was jointly held with MD Sea Grant in late 2009. National science, policy, and management leaders convened to discuss complex AIS challenges and opportunities for action. The emphasis was on two major vectors - maritime shipping and live trade - and the linked pathways through which exotic species are introduced to Mid-Atlantic coastal and inland waters. To guide the way forward, participants developed a framework detailing the following:

- Non-native Species Assessment in the Mid-Atlantic region through sampling of all active vectors
- Identification of Potentially Harmful Species utilizing comprehensive risk assessment data and other tools
- Actions to Halt Importations or Releases
- Education and Outreach
- Enforcement

Panel Priorities

- Encourage member states to develop an AIS management plan
- Implement AIS management plans
- Build on current regional efforts in early detection and rapid response
- Develop vector management strategies for states and the Mid-Atlantic region
- Develop and use existing national databases to map distributions of AIS in the Mid-Atlantic region
- Examine regional coordination efforts for preventing the spread of AIS

In early 2009, MAPAIS and MD Sea Grant completed *Rapid Response Planning for Aquatic Invasive Species- A Maryland Example* with NOAA funding and support from the FWS Chesapeake Bay Field Office and the Chesapeake Bay Program. Major plan components include:

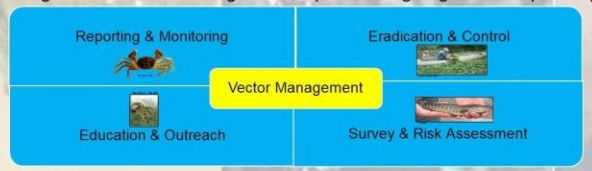
- Overview of Rapid Response Effort
- USCG Operational Planning "P"- a visual representation of the Incident Command System (ICS) planning process
- Decision Tree for When to Take Action
- Aquatic Invasive Species Sighting Report Form to streamline the information gathering process
- ICS Job Descriptions

A template is also available to encourage states to adapt the plan to fit their needs.

AIS Combat : Ground Troops

Since 2007, the Panel has been conducting an annual small grants competition encouraging proposals that have relevance to the MAP mission and priorities as well as regional significance. Selected projects tackle on-the ground activities to thwart aquatic invasive species. There is particular interest in the development of mechanisms to pursue effective vector management. The following are samples of ongoing and completed projects funded by the Panel.

- Chinese Mitten Crab Regional Monitoring Network and Web-Based Reporting System for the Chesapeake and Delaware Bays and the Mid-Atlantic Coast (Smithsonian Environmental Research Center)
- AIS Field Guide for Pennsylvania (PA Sea Grant)
- Outreach Regarding Virginia's Phragmites Invasion (VA Department of Conservation & Recreation)



- Pilot Project for Data-Driven Nutria Study and Removal from Nags Head Woods Ecological Preserve (Nature Conservancy- NC Chapter)
- Water Chestnut Eradication in the Sassafras and Bird Rivers (Maryland Department of Natural Resources)
- Estimating Risk of Fish Invaders in the Mid-Atlantic Region (Virginia Tech, Department of Fisheries & Wildlife Sciences)

For more information: http://www.midatlanticpanel.org/

Overview

Dr. Fredrika Moser, Maryland Sea Grant, presented a talk, *Preventing AIS Introductions through Vector Management: Lessons from the Mid-Atlantic Regional Panel,* at the joint meeting of the Gulf and South Atlantic Regional Panel (GSARP) and Mississippi River Basin Panel (MRBP) on October 10, 2012. The talk highlighted the Mid-Atlantic Panel (MAP) current efforts in AIS vector management. The talk focused on the MAP workshop on vector management and providing a summary of the on-going Maryland Sea Grant regional research project on live bait vector management. This talk was one of several talks during the morning meeting that focused on vector management. Following the talks, there was a lively and thoughtful discussion with the membership of the GSARP and MRBP on their interest in pursuing vector management in their regions. Although, the panels have numerous pressing AIS issues to address, they did feel that vector management discussions should be part of each panel's further deliberations. They agreed to continue discussing how each of their panels might want to include vector management in their priorities and agreed to work separately and then re-convene to identify ways to move the vector management effort forward.

Summary Maryland Sea Grant Regional Vector Management Project Talk

In 2009, Maryland Sea Grant and the MAP held a joint workshop that produced recommendations on how to implement vector management approaches to preventing AIS introductions. Drawing on the workshop findings and the interest of the mid-Atlantic Panel members in vector management, the mid-Atlantic Sea Grant programs submitted a proposal to NOAA seeking support for a pilot project to investigate vector management in the region. In 2010, Maryland Sea Grant received funding to lead an effort to address managing the live bait vector in the mid-Atlantic.

The focus of the NOAA funded research is the project, *Importation of Baitworms and their Live Algal Packing Materials to the Mid-Atlantic: Vector Characterization,* which couples biological and social science research and outreach to understand the live bloodworm bait trade, from suppler to user, and identify potential management options to minimize the introduction of AIS through this vector. The biological research, led by Dr. Whitman Miller at the Smithsonian Environmental Research Center, focuses on understanding the abundance and diversity of organisms associated with the algae packing material used in bloodworm bait boxes that are sold throughout the mid-Atlantic and the potential for interventions along the vector to minimize the risk of introduction of organisms associated with the algae into receiving waters. The social science research, led by Dr. Michael Paolisso at the University of Maryland, is investigating angler attitudes and habits regarding proper disposal of live bait and prevention of AIS. The outreach component engages the mid-Atlantic Sea Grant programs outreach and extension work, including administering surveys to anglers and developing effective intervention strategies with anglers and bait shops.

To date, the live bait vector research has begun identifying key intervention points along the bloodworm distribution chain, thus providing potential opportunities for effective intervention strategies. The final phase of this project is to design a small intervention pilot study working with select bait shops in the Mid-Atlantic and distributors in Maine to investigate opportunities for voluntary behavior change to minimize risk of AIS introductions. Findings from this study should improve our understanding of the live bait vector and inform education and management efforts as to the effectiveness of using a vector approach to preventing aquatic invasive species introductions.