



Aquatic Nuisance Species Task Force Activity Reporting Form

Form Instructions:

Report Type: Select Federal Member, Ex officio Member, or Regional Panel.

Affiliation: Specify the entity that the report will represent. If reporting for more than one entity, a separate form should be completed for each organization.

Point of Contact: Information for the individual who can address any follow-up questions about the form.

Accomplishments and Ongoing Efforts: Information should be completed for each specific Activity conducted within your organization that supports the goals and objectives of the ANSTF Strategic Plan. Additional pages will be generated as needed.

Requested information for each Activity includes:

- **Activity Title:** A distinct title that can be used to identify the Activity.
- **Activity Description:** Brief description about the Activity that includes its goal, implementation steps, and how it supports the ANSTF Strategic Plan. If the Activity has been completed, include a short statement about what was accomplished. If the Activity is ongoing, include a short statement on what has been achieved to date.
- **Status:** Select Planned, Ongoing, Complete, or Routine Operation. Routine Operations are those that are performed on a routine basis to support the ANSTF or reporting organization (e.g., meetings, maintaining databases / websites).
- **Start / End Date:** Indicate the time frame when the Activity will be conducted. Fiscal Year(s) is sufficient; if more detailed information is available, please indicate.
- **Lead Organization:** Agency, Regional Panel, organization, or committee responsible for project implementation
- **Partners Organization(s):** Other entities involved in the projects. Please list all partners, even those not associated with ANSTF.
- **Funding Amount and Source(s):** Select the appropriate funding type and specify the specific agency / organization. For each funding type selected, include the amount of funding provided per fiscal year. Total Funding will be automatically calculated. If funding is "To be Determined"; indicate as "0" and note as such in "Additional Comments."
- **Relation to the ANSTF Strategic Plan Goals and Objectives:** Select the ANSTF Strategic Plan Goals and Objectives supported by the project. If the project clearly supports multiple goals, selecting more than one is acceptable. For each Goal selected, indicate the amount of funding spent for the management category (from all sources) per fiscal year. Total Funding will be automatically calculated; ensure that the amount matches the Total Funding in the Funding Amount and Source(s) section above.
- **Additional Comments (optional):** Any additional information you feel is necessary to adequately describe the Activity and its relationship to the ANSTF Strategic Plan.
- **Documents and Images (optional):** Citation, internet link, for documents and images relevant to this project. Write "Attached" if documents or images will be attached to the form submission.

Report Type:

Regional Panel

Member or Panel:

Mid-Atlantic Panel on Aquatic Invasive Species

Point of Contact:

Name:

Ray Fernald

Title:

Chair, Mid-Atlantic Panel on Aquatic Invasive Species

Organization

Virginia Department of Game and Inland Fisheries

Address

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Phone:

804-367-8364

Accomplishments and Ongoing Efforts:

Activity Title: Administration and Coordination of Panel Activities, and interagency Communications

Activity Description: Goals, activities, implementation steps, outcomes, and linkage to ANSTF Strategic Plan:

The mission of the Mid-Atlantic Panel is to assist state and federal agencies and other stakeholders in developing and implementing strategic, coordinated, and action-oriented approaches for the prevention and control of aquatic invasive species in the mid-Atlantic region, and to coordinate and communicate these activities with the other Regional Panels, the ANSTF, and other partners. The MAPAIS chair attended the All-Panels Meeting and ANSTF meeting in November 2016; the scheduled spring 2017 meeting was canceled due to the ongoing continuing FAC review of ANSTF.

The fall 2016 MAPAIS meeting was held 15-16 November 2016 in Annapolis, MD. In addition to routine business matters, the agenda included member updates and presentations on several Small Grant Projects and other topics including New Zealand Mud Snails, the Chesapeake Bay Nutria Eradication Program, Zebra Mussels in Maryland, biogeography of didymo, and the Maryland Invasive Species Plan. The meeting was followed by a tour of the Smithsonian Environmental Research Center in nearby Edgewater, MD.

The spring 2017 MAPAIS meeting was scheduled to be held as a joint meeting with the Northeast Aquatic Nuisance Species Panel (NEANSP) in July 2017, but was canceled because of the ongoing FAC review of ANSTF and its subcommittees. Because the Panel was unable to meet, the Executive Committee, with input from reviewers of subgrant submissions, conducted a conference call to determine recipients of the MAPAIS Small Grant Projects awards for 2017, as presented below.

This Activity supports Objectives 1.1, 1.2, 1.3, and 1.4 of the ANSTF Strategic Plan by enhancing coordination among MAPAIS agencies and partners, and the ANSTF, regarding all facets of AIS prevention, detection, and control. It also addresses Objective 8.2 by optimizing use of current funding for ANS activities by engaging potential resources and programs within Federal agencies and additional partners.

Status: Routine Operation

Start Date: 1 October 2016

End Date, if applicable: 30 June 2018

Lead Organization: MAPAIS

Partner Organization(s): All Panel members and organizations, and invited speakers and public guests at MAPAIS meetings.

Funding Amount and Source(s)

	Source(s)	\$ Amount - FY 16	\$ Amount - FY 17	\$ Amount - FY 18
<input checked="" type="checkbox"/>	Federal Agency U.S. Fish and Wildlife Service	5,382	2,125	0
<input type="checkbox"/>	State Government			
<input type="checkbox"/>	Local Government			
<input type="checkbox"/>	Tribal Government			
<input type="checkbox"/>	Academic Institution			
<input type="checkbox"/>	NGO			
<input type="checkbox"/>	Other			
Total Funding for Activity		5,382	2,125	0

Relation to the ANSTF Strategic Plan Goals and Objectives

- Coordination \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 1.1: Strengthen the coordination capacity of the ANSTF
 - Objective 1.2: Evaluate the ability of statutory authorities, regulations, and programs necessary to implement ANSTF goals and objectives
 - Objective 1.3: Facilitate the development and continued effectiveness of State and interstate ANS management plans
 - Objective 1.4: Coordinate the development and implementation of ANSTF- approved species control and management plans and pathway management plans
 - Objective 1.5: Cooperate with nations that have neighboring waters and shared pathways with the United States to prevent, detect, and control ANS
- Prevention \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 2.1: Take steps to interdict specific pathways by developing and implementing guidance and appropriate measures
 - Objective 2.2: Facilitate use of science-based risk assessment and screening procedures to assess and prioritize pathways for the introduction of ANS or potential species of concern
 - Objective 2.3: Expand training and use of the Hazard Analysis and Critical Control Point (HACCP) program into work conducted by natural resource managers
- ERDRR \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 3.1: Facilitate surveys and monitoring to detect ANS
 - Objective 3.2: Make taxonomic and ecological information and expertise readily available
 - Objective 3.3: Increase public and industry involvement in early detection and rapid response programs
 - Objective 3.4: Facilitate development of rapid response contingency plans
 - Objective 3.5: Build capacity to respond rapidly to invasions
- Control \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 4.1: Support and evaluate ANSTF-approved control and management plans
 - Objective 4.2: Increase invasive species training for natural resource managers and leverage participation
 - Objective 4.3: Evaluate the benefits and risks associated with the commercial harvest of ANS as a means of control or eradication
 - Objective 4.4: Encourage an Integrated Pest Management (IPM) approach to manage existing ANS populations.
- Restoration \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 5.1: Restore impacted ecosystems
 - Objective 5.2: Address and provide technical assistance for invasive species management before, during, and after habitat restoration projects

Education \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 6.1: Increase understanding among the general public of the problems and impacts associated with ANS and actions that can be taken to prevent and control ANS
- Objective 6.2: Disseminate ANS outreach and technical guidance materials to target audiences
- Objective 6.3: Promote the use of guidance documents, best management practices and other outreach materials related to ANS
- Objective 6.4: Promote awareness of the ANSTF and its activities and provide educational briefings on ANS threats and solutions and to legislators and other decision makers

Research \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 7.1: Develop and maintain a list of ANS research priorities; communicate this list to the scientific community
- Objective 7.2: Develop and maintain guidance documents, protocols, and best management practices related to ANS
- Objective 7.3: Track the progress of research activities funded or prioritized by the ANSTF
- Objective 7.4: Support development of socio-economic research to quantify the economic impact of ANS
- Objective 7.5: Support research on interdiction methods for specific pathways of ANS
- Objective 7.6: Support efforts to identify gaps and expand research relevant to control and eradication measures to address ANS that have become established
- Objective 7.7: Encourage research to develop species invasion-risk forecast tools
- Objective 7.8: Support existing databases and global database networks

Funding \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 8.1: Secure dedicated, long-term funding for the ANSTF Strategic Plan actions
- Objective 8.2: Optimize use of current funding for ANS activities by engaging potential resources and programs within Federal agencies and additional partners
- Objective 8.3: Develop a list of ANS funding priorities

Total Funding: \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

Additional Comments (Optional):

While this activity addresses virtually all ANSTF Goals and Objectives in some fashion, it focuses on coordination of efforts among MAPAIS states and agencies: Activities more directly addressing specific Goals and Objectives are highlighted below. MAPAIS allocates most of our USFWS funding among projects in our Small Grants Program. Other expenditures include MAPAIS special projects such as our MAPAIS website redesign and relaunch, minimal expenses for meeting facilitation, administrative and fiscal support provided by Maryland Sea Grant, and travel by the MAPAIS chair to semiannual ANSTF and All-Panel meetings. No reimbursement is routinely provided to MAPAIS members or meeting participants for their time or travel expenses, unless provided for via a SGP subgrant.

Documents and Images (Optional)

Attachment: Fall2016MAPAISMinutesAgendaFinal.pdf

Additional Projects to Report?

- Yes** Please continue by entering information for the next project on the following pages
- No**

Accomplishments and Ongoing Efforts:

Activity Title:

Activity Description: Goals, activities, implementation steps, outcomes, and linkage to ANSTF Strategic Plan:

The Panel conducts an annual grants competition to fund on-the-ground activities addressing MAPAIS' mission and regional priorities. Since 2007, the Panel has awarded \$431,563 in project funding, and has leveraged over half a million dollars in partner funds. Three projects were completed in 2017, including: (1) Training and evaluation of dogs for early detection of nutria; (2) Economic Analysis of AIS risk and risk reduction in the bloodworm trade; and (3) and Pymatuning Invasive species boat inspection stations. One ongoing project from FY2016 continued through FY2017: The use of environmental DNA (eDNA) to detect the emergent infectious pathogens in amphibian populations.

Because our spring 2017 meeting was canceled, the MAPAIS Executive Committee, with input from reviewers of subgrant submissions, conducted a conference call to determine recipients of the MAPAIS Small Grant Projects awards for 2017. Five new projects were selected for funding, including: (1) An analysis of the recreational vector and associated pathways to aid in the prevention of invasive species introductions in mid-Atlantic waterways; (2) Monitoring to manage: determining best population control approaches for the northern snakehead, Channa argas, in Jug Bay tidal freshwater marshes, Patuxent River; (3) Using environmental DNA to detect early stages of the invasion of a destructive freshwater snail; (4) First International snakehead symposium; and (5) Mid-Atlantic lake forum: a regional approach to AIS control and management.

Each SPG projects is documented below as a discrete Activity, beginning with the first fiscal year of project funding.

This Activity supports Objectives 1.1, 1.2, 1.3, and 1.4 of the ANSTF Strategic Plan by enhancing coordination among MAPAIS agencies and partners, and the ANSTF, regarding all facets of AIS prevention, detection, and control. It also supports Objectives 8.2 and 8.3 regarding optimizing funding of ANS activities in the region, and establishment of regional AIS management and research priorities.

Status:

Start Date:

End Date, if applicable:

Lead Organization:

Partner Organization(s):

Funding Amount and Source(s)

	Source(s)	\$ Amount - FY 16	\$ Amount - FY 17	\$ Amount - FY 18
<input checked="" type="checkbox"/>	Federal Agency <input type="text" value="U.S. Fish and Wildlife Service"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<input type="checkbox"/>	State Government <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	Local Government <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	Tribal Government <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	Academic Institution <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	NGO <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	Other <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Total Funding for Activity		<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>

Relation to the ANSTF Strategic Plan Goals and Objectives

Coordination \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 1.1: Strengthen the coordination capacity of the ANSTF
- Objective 1.2: Evaluate the ability of statutory authorities, regulations, and programs necessary to implement ANSTF goals and objectives
- Objective 1.3: Facilitate the development and continued effectiveness of State and interstate ANS management plans
- Objective 1.4: Coordinate the development and implementation of ANSTF- approved species control and management plans and pathway management plans
- Objective 1.5: Cooperate with nations that have neighboring waters and shared pathways with the United States to prevent, detect, and control ANS

Prevention \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 2.1: Take steps to interdict specific pathways by developing and implementing guidance and appropriate measures
- Objective 2.2: Facilitate use of science-based risk assessment and screening procedures to assess and prioritize pathways for the introduction of ANS or potential species of concern
- Objective 2.3: Expand training and use of the Hazard Analysis and Critical Control Point (HACCP) program into work conducted by natural resource managers

ERDRR \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 3.1: Facilitate surveys and monitoring to detect ANS
- Objective 3.2: Make taxonomic and ecological information and expertise readily available
- Objective 3.3: Increase public and industry involvement in early detection and rapid response programs
- Objective 3.4: Facilitate development of rapid response contingency plans
- Objective 3.5: Build capacity to respond rapidly to invasions

Control \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 4.1: Support and evaluate ANSTF-approved control and management plans
- Objective 4.2: Increase invasive species training for natural resource managers and leverage participation
- Objective 4.3: Evaluate the benefits and risks associated with the commercial harvest of ANS as a means of control or eradication
- Objective 4.4: Encourage an Integrated Pest Management (IPM) approach to manage existing ANS populations.

Restoration \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 5.1: Restore impacted ecosystems
- Objective 5.2: Address and provide technical assistance for invasive species management before, during, and after habitat restoration projects

Education \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 6.1: Increase understanding among the general public of the problems and impacts associated with ANS and actions that can be taken to prevent and control ANS
- Objective 6.2: Disseminate ANS outreach and technical guidance materials to target audiences
- Objective 6.3: Promote the use of guidance documents, best management practices and other outreach materials related to ANS
- Objective 6.4: Promote awareness of the ANSTF and its activities and provide educational briefings on ANS threats and solutions and to legislators and other decision makers

Research \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 7.1: Develop and maintain a list of ANS research priorities; communicate this list to the scientific community
- Objective 7.2: Develop and maintain guidance documents, protocols, and best management practices related to ANS
- Objective 7.3: Track the progress of research activities funded or prioritized by the ANSTF
- Objective 7.4: Support development of socio-economic research to quantify the economic impact of ANS
- Objective 7.5: Support research on interdiction methods for specific pathways of ANS3
- Objective 7.6: Support efforts to identify gaps and expand research relevant to control and eradication measures to address ANS that have become established
- Objective 7.7: Encourage research to develop species invasion-risk forecast tools
- Objective 7.8: Support existing databases and global database networks

Funding \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 8.1: Secure dedicated, long-term funding for the ANSTF Strategic Plan actions
- Objective 8.2: Optimize use of current funding for ANS activities by engaging potential resources and programs within Federal agencies and additional partners
- Objective 8.3: Develop a list of ANS funding priorities

Total Funding: \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

Additional Comments (Optional):

While this activity addresses virtually all ANSTF Goals and Objectives in some fashion, it focuses on solicitation, review, and funding of specific AIS projects and activities to be developed and implemented by MAPAIS member agencies, NGOs, academic institutions, local governments, and other state and federal agencies. The goals and objectives of each project funded through out Small Grants Program are addressed in the project-specific narratives below. Similarly, Small Grant Project expenditures are provided in the Activity Report for each individual project. Expenditures related to management of the budgets, grants, and reports of the Small Grants Program are included in the total reported under Administration and Coordination, above.

Documents and Images (Optional)

Additional Projects to Report?

- Yes** Please continue by entering information for the next project on the following pages
- No**

Accomplishments and Ongoing Efforts:

Activity Title: Small Grant Project: Training and Evaluation of Dogs for Early Detection of Nutria (*Myocaster coypus*)

Activity Description: Goals, activities, implementation steps, outcomes, and linkage to ANSTF Strategic Plan:

Through efforts funded in part by MAPAIS, the Interagency Mid-Atlantic Nutria Management Team has determined the known range of nutria in Virginia; established management zones for detection, monitoring, and eradication of this species; and developed a cooperative interagency program to address this invasive threat. Our primary objective addressed in this study was to develop an ability to detect range expansions within the "Early Detection – Rapid Response" management zone, and to facilitate "mop up" operations in areas that have already undergone extensive nutria removal, by developing an effective way to detect low-density nutria populations and incursions characteristic of range expansion or reoccupation. This project was designed to evaluate whether a dog can determine nutria presence or absence effectively, by controlling for the following variables: distance from evidence (1, 10, 20, and 40 meters), speed of search for evidence (1, 5, and 10 kilometers per hour), type of evidence (scat, hair, scent trail, and carcass), environmental exposure of the evidence (measured UV light, temperature, water saturation, and age), and likely false positives (muskrat, beaver, raccoon, and otter).

The investigators trained 2 subjects ("Birdee" and "Jake") and then measured their performance accuracy (sensitivity and specificity) to detect nutria target odors and avoid non-target likely marsh mammal (muskrat, beaver, raccoon, and otter) odors, and efficiency by the time it took to locate a target and the distance at which they detected it under various environmental conditions. We measured distance from the "change of behavior" to target, time of search from start to an alert, positive and false positive alerts and environmental variables (temperature, humidity, wind, and target moisture). The test subjects were extremely accurate; across 688 trials conducted either indoors or outdoors under a variety of atmospheric conditions the subjects altogether committed only 6 detection errors (2 misses, and 4 false alarms), for an aggregate accuracy rate of 99.1%.

This Activity supports Objectives 3.1, 3.3, 3.4, and 3.5 of the ANSTF Strategic Plan by enhancing ANS early detection / rapid response efforts, Objectives 4.1 and 4.2 regarding support of approved AIS control and management plans and invasive species training for natural resources managers, and Objectives 7.2 and 7.6 regarding development of guidance documents and protocols, and identification of gaps and expanding research relevant to control and eradication measures to address established ANS.

Status: Complete

Start Date: 1 October 2015

End Date, if applicable: 30 September 2017

Lead Organization: Virginia Department of Game and Inland Fisheries / Todd Engelmeyer

Partner Organization(s): Natural Resource Protection Dogs, LLC.

Funding Amount and Source(s)

	Source(s)	\$ Amount - FY 16	\$ Amount - FY 17	\$ Amount - FY 18
<input checked="" type="checkbox"/>	Federal Agency USFWS (via MAPAIS)	8,500	0	0
<input type="checkbox"/>	State Government 			
<input type="checkbox"/>	Local Government 			
<input type="checkbox"/>	Tribal Government 			
<input type="checkbox"/>	Academic Institution 			
<input type="checkbox"/>	NGO 			
<input type="checkbox"/>	Other 			
Total Funding for Activity		8,500	0	0

Relation to the ANSTF Strategic Plan Goals and Objectives

- Coordination \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 1.1: Strengthen the coordination capacity of the ANSTF
 - Objective 1.2: Evaluate the ability of statutory authorities, regulations, and programs necessary to implement ANSTF goals and objectives
 - Objective 1.3: Facilitate the development and continued effectiveness of State and interstate ANS management plans
 - Objective 1.4: Coordinate the development and implementation of ANSTF- approved species control and management plans and pathway management plans
 - Objective 1.5: Cooperate with nations that have neighboring waters and shared pathways with the United States to prevent, detect, and control ANS
- Prevention \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 2.1: Take steps to interdict specific pathways by developing and implementing guidance and appropriate measures
 - Objective 2.2: Facilitate use of science-based risk assessment and screening procedures to assess and prioritize pathways for the introduction of ANS or potential species of concern
 - Objective 2.3: Expand training and use of the Hazard Analysis and Critical Control Point (HACCP) program into work conducted by natural resource managers
- ERDRR \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 3.1: Facilitate surveys and monitoring to detect ANS
 - Objective 3.2: Make taxonomic and ecological information and expertise readily available
 - Objective 3.3: Increase public and industry involvement in early detection and rapid response programs
 - Objective 3.4: Facilitate development of rapid response contingency plans
 - Objective 3.5: Build capacity to respond rapidly to invasions
- Control \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 4.1: Support and evaluate ANSTF-approved control and management plans
 - Objective 4.2: Increase invasive species training for natural resource managers and leverage participation
 - Objective 4.3: Evaluate the benefits and risks associated with the commercial harvest of ANS as a means of control or eradication
 - Objective 4.4: Encourage an Integrated Pest Management (IPM) approach to manage existing ANS populations.
- Restoration \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 5.1: Restore impacted ecosystems
 - Objective 5.2: Address and provide technical assistance for invasive species management before, during, and after habitat restoration projects

Education \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 6.1: Increase understanding among the general public of the problems and impacts associated with ANS and actions that can be taken to prevent and control ANS
- Objective 6.2: Disseminate ANS outreach and technical guidance materials to target audiences
- Objective 6.3: Promote the use of guidance documents, best management practices and other outreach materials related to ANS
- Objective 6.4: Promote awareness of the ANSTF and its activities and provide educational briefings on ANS threats and solutions and to legislators and other decision makers

Research \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 7.1: Develop and maintain a list of ANS research priorities; communicate this list to the scientific community
- Objective 7.2: Develop and maintain guidance documents, protocols, and best management practices related to ANS
- Objective 7.3: Track the progress of research activities funded or prioritized by the ANSTF
- Objective 7.4: Support development of socio-economic research to quantify the economic impact of ANS
- Objective 7.5: Support research on interdiction methods for specific pathways of ANS3
- Objective 7.6: Support efforts to identify gaps and expand research relevant to control and eradication measures to address ANS that have become established
- Objective 7.7: Encourage research to develop species invasion-risk forecast tools
- Objective 7.8: Support existing databases and global database networks

Funding \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 8.1: Secure dedicated, long-term funding for the ANSTF Strategic Plan actions
- Objective 8.2: Optimize use of current funding for ANS activities by engaging potential resources and programs within Federal agencies and additional partners
- Objective 8.3: Develop a list of ANS funding priorities

Total Funding: \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

Additional Comments (Optional):

Documents and Images (Optional)

Attachment: NutriaDetectionDogs2015_FinalReport_Engelmeyer2017.pdf

Additional Projects to Report?

- Yes** Please continue by entering information for the next project on the following pages
- No**

Accomplishments and Ongoing Efforts:

Activity Title: Small Grant Project: Economic Analysis of AIS Risk and Risk Reduction in the Bloodworm Trade

Activity Description: Goals, activities, implementation steps, outcomes, and linkage to ANSTF Strategic Plan:

This project was designed to evaluate the economics of the commercial movement of bloodworms from sources along the Maine coast to the Chesapeake Bay region of the Atlantic coast and worldwide. Building on earlier research (supported by MAPAIS) on the ecological and social aspects of the trade in bloodworms, and in collaboration with researchers involved in that earlier work, Dr. Wieland expanded upon the previous research by considering the economic aspects of risk and risk reduction in the bloodworm trade.

Two levels of costs were analyzed: first, the monetized cost of ecological impacts of an introduction (i.e., the scenario in which no attempt is made to mitigate risk of introduction), discounted by relevant probabilities; and, secondly, as the costs incurred by producers and consumers when risk-mitigating practices are implemented. Several approaches have been proposed for reducing incidental biota in the shipment of live bloodworms and the likelihood of unintended introductions. Estimating the cost of implementing those approaches was a project objective, utilizing findings from earlier bloodworm research regarding the efficacy of risk reduction practices. Cost effects were considered in the wider context of both factor and product markets. In factor markets, Dr. Wieland evaluated the impact of changes in packing material on people who currently earn livelihoods supplying that packing material. Regarding product markets, he evaluated the potential for welfare effects in markets for recreational fishing.

The project report was written as a white paper, discussing a general economic approach for determining optimal levels of spending on AIS prevention versus management and measuring the costs of successful establishment of an AIS. That discussion was fleshed out with respect to three AIS hitchhikers thought to have been introduced through the bloodworm trade and associated costs of their establishment and attempts to manage them. We used information gathered through fieldwork to estimate prevention costs for all three species. The economics of non-market costs is described for the sample of hitchhikers where existing research allows.

Bloodworm customers in the Mid-Atlantic states and California prefer to receive their bloodworms packed in wormweed. From that in tandem with the findings described above, we deduced that demand from recreational fishermen is an obstacle to reforming practice in the industry, such that the hazard of AIS introductions might be reduced. To be clear, the problem is not wholesale and retail demand for bloodworms. The problem is wholesale and retail demand for bloodworms packed in wormweed.

This Activity supports Objectives 7.4 and 7.5 of the ANSTF Strategic Plan regarding research into the socioeconomic costs and impacts of AIS, regarding identification of specific AIS pathways of AIS. It also addresses Objective 2.2 regarding risk assessment of AIS introduction pathways, and Objective 6.1 regarding increasing public understanding of such risks and available preventative actions.

End Date, if applicable: 30 September 2017

Lead Organization: Main Street Economics, LLC / Dr. Robert Weiland

Partner Organization(s): University of Maryland / J. Trombley

Funding Amount and Source(s)

	Source(s)	\$ Amount - FY 16	\$ Amount - FY 17	\$ Amount - FY 18
<input checked="" type="checkbox"/>	Federal Agency USFWS (via MAPAIS)	2,256	18,174	0
<input type="checkbox"/>	State Government 			
<input type="checkbox"/>	Local Government 			
<input type="checkbox"/>	Tribal Government 			
<input type="checkbox"/>	Academic Institution 			
<input type="checkbox"/>	NGO 			
<input type="checkbox"/>	Other 			
Total Funding for Activity		2,256	18,174	0

Relation to the ANSTF Strategic Plan Goals and Objectives

- Coordination \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 1.1: Strengthen the coordination capacity of the ANSTF
 - Objective 1.2: Evaluate the ability of statutory authorities, regulations, and programs necessary to implement ANSTF goals and objectives
 - Objective 1.3: Facilitate the development and continued effectiveness of State and interstate ANS management plans
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- ERDRR \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
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 - Objective 3.4: Facilitate development of rapid response contingency plans
 - Objective 3.5: Build capacity to respond rapidly to invasions
- Control \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 4.1: Support and evaluate ANSTF-approved control and management plans
 - Objective 4.2: Increase invasive species training for natural resource managers and leverage participation
 - Objective 4.3: Evaluate the benefits and risks associated with the commercial harvest of ANS as a means of control or eradication
 - Objective 4.4: Encourage an Integrated Pest Management (IPM) approach to manage existing ANS populations.
- Restoration \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 5.1: Restore impacted ecosystems
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Education \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 6.1: Increase understanding among the general public of the problems and impacts associated with ANS and actions that can be taken to prevent and control ANS
- Objective 6.2: Disseminate ANS outreach and technical guidance materials to target audiences
- Objective 6.3: Promote the use of guidance documents, best management practices and other outreach materials related to ANS
- Objective 6.4: Promote awareness of the ANSTF and its activities and provide educational briefings on ANS threats and solutions and to legislators and other decision makers

Research \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 7.1: Develop and maintain a list of ANS research priorities; communicate this list to the scientific community
- Objective 7.2: Develop and maintain guidance documents, protocols, and best management practices related to ANS
- Objective 7.3: Track the progress of research activities funded or prioritized by the ANSTF
- Objective 7.4: Support development of socio-economic research to quantify the economic impact of ANS
- Objective 7.5: Support research on interdiction methods for specific pathways of ANS3
- Objective 7.6: Support efforts to identify gaps and expand research relevant to control and eradication measures to address ANS that have become established
- Objective 7.7: Encourage research to develop species invasion-risk forecast tools
- Objective 7.8: Support existing databases and global database networks

Funding \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 8.1: Secure dedicated, long-term funding for the ANSTF Strategic Plan actions
- Objective 8.2: Optimize use of current funding for ANS activities by engaging potential resources and programs within Federal agencies and additional partners
- Objective 8.3: Develop a list of ANS funding priorities

Total Funding: \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

Additional Comments (Optional):

To facilitate work during summer and fall 2016, before FFY2017 began, MAPAIS awarded a small portion of the project funds from unallocated FFY2016 grant funds. The project otherwise falls within our FFY2017 "year-class" of SPG projects.

Documents and Images (Optional)

Attachment: EconomcAnalysisAISRisksBloodwormTrade_FinalReport_Wieland2016.pdf.

Additional Projects to Report?

- Yes** Please continue by entering information for the next project on the following pages
- No**

Accomplishments and Ongoing Efforts:

Activity Title: Small Grant Project: Pymatuning Invasive Species Boat Inspection Stations

Activity Description: Goals, activities, implementation steps, outcomes, and linkage to ANSTF Strategic Plan:

The goals of this project were to support the start-up of a pilot launch steward program at the 13 Pennsylvania boat launches on Pymatuning Reservoir. The pilot program included training of volunteer and paid staff coordinated by Pymatuning State Park staff to greet boaters as they launch and retrieve boats during the heaviest of the boating season. The launch stewards inspected boats for AIS and asked for voluntary removal. Launch stewards provided informational material on AIS prevention provided by Pennsylvania Sea Grant. The funds from this project were used to develop a cohesive look to the program in the form of signage, attire, and stations. The funds also were used to support AIS disposal and cleaning apparatus for the stations.

Over the course of 2016, 2,181 surveys were completed. When boaters were approached by launch stewards and asked if they were willing to participate in a survey and boat check; 88 boaters chose not to participate. In 2017, 1,935 surveys were completed, and 309 boaters chose not to participate. Thus, during the two seasons, 4,513 boaters were encountered, with 4,116 boat inspections being conducted.

In 2016, aquatic species were removed from 148 boats (7% of those surveyed). Species removed from boats not last on Pymatuning included Eurasian watermilfoil, zebra mussels, elodea, curly-leaf pondweed, wild celery, and fanwort. In 2017, aquatic species were removed from 182 boats surveyed (10%). Species removed in 2017 from boats not last on Pymatuning Reservoir included Eurasian watermilfoil, elodea, curly-leaf pondweed, water lily, wild celery, narrowleaf cattail, and fanwort.

Launch stewards distributed AIS education material including fact sheets, key chains, and bobbers at boat lunches, in addition to distributing 5,000 AIS prevention themed drink coasters to local restaurants and bars. The handout materials were provided by Pennsylvania Sea Grant. In addition to the launch steward program the project was able to install 16 AIS disposal stations at all PA and Ohio boat launches on Pymatuning Reservoir. The stations were based on a design provided by NY State. The disposal stations were built by an Eagle Scout and placed over the 2017 Labor Day weekend. Also, three high pressure wash stations were installed at the Jamestown Marina and Linesville Marina for voluntary decontamination of incoming and outgoing boat traffic.

The project was considered a dramatic success, and has spawned significant interest in implementation of similar campaigns and programs at other lakes, reservoirs, and boat launches throughout the state.

This Activity supports Objectives 2.1 of the ANSTF Strategic Plan by implementing measures to interdict a specific AIS pathway, and Objectives 3.1, 3.2, and 3.3 by facilitating surveys and monitoring of AIS, making information and expertise readily available, and increasing public involvement in EDRR programs. It also addresses Objective 4.2 by providing AIS training for natural resources professionals, and Objectives 6.1, 6.2, and 6.3 by providing educational materials to the public, other target audiences, and natural resource managers regarding AIS issues and best management practices.

Status: Complete

Start Date: 1 October 2016

End Date, if applicable: 30 September 2017

Lead Organization: Pymatuning State Park, Stacie Hall

Partner Organization(s):

Funding Amount and Source(s)

	Source(s)	\$ Amount - FY 16	\$ Amount - FY 17	\$ Amount - FY 18
<input checked="" type="checkbox"/>	Federal Agency USFWS (via MAPAIS)	0	9,400	0
<input type="checkbox"/>	State Government 			
<input type="checkbox"/>	Local Government 			
<input type="checkbox"/>	Tribal Government 			
<input type="checkbox"/>	Academic Institution 			
<input type="checkbox"/>	NGO 			
<input type="checkbox"/>	Other 			
	Total Funding for Activity	0	9,400	0

Relation to the ANSTF Strategic Plan Goals and Objectives

Coordination \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 1.1: Strengthen the coordination capacity of the ANSTF
- Objective 1.2: Evaluate the ability of statutory authorities, regulations, and programs necessary to implement ANSTF goals and objectives
- Objective 1.3: Facilitate the development and continued effectiveness of State and interstate ANS management plans
- Objective 1.4: Coordinate the development and implementation of ANSTF- approved species control and management plans and pathway management plans
- Objective 1.5: Cooperate with nations that have neighboring waters and shared pathways with the United States to prevent, detect, and control ANS

Prevention \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 2.1: Take steps to interdict specific pathways by developing and implementing guidance and appropriate measures
- Objective 2.2: Facilitate use of science-based risk assessment and screening procedures to assess and prioritize pathways for the introduction of ANS or potential species of concern
- Objective 2.3: Expand training and use of the Hazard Analysis and Critical Control Point (HACCP) program into work conducted by natural resource managers

ERDRR \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 3.1: Facilitate surveys and monitoring to detect ANS
- Objective 3.2: Make taxonomic and ecological information and expertise readily available
- Objective 3.3: Increase public and industry involvement in early detection and rapid response programs
- Objective 3.4: Facilitate development of rapid response contingency plans
- Objective 3.5: Build capacity to respond rapidly to invasions

Control \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 4.1: Support and evaluate ANSTF-approved control and management plans
- Objective 4.2: Increase invasive species training for natural resource managers and leverage participation
- Objective 4.3: Evaluate the benefits and risks associated with the commercial harvest of ANS as a means of control or eradication
- Objective 4.4: Encourage an Integrated Pest Management (IPM) approach to manage existing ANS populations.

Restoration \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 5.1: Restore impacted ecosystems
- Objective 5.2: Address and provide technical assistance for invasive species management before, during, and after habitat restoration projects

Education \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 6.1: Increase understanding among the general public of the problems and impacts associated with ANS and actions that can be taken to prevent and control ANS
- Objective 6.2: Disseminate ANS outreach and technical guidance materials to target audiences
- Objective 6.3: Promote the use of guidance documents, best management practices and other outreach materials related to ANS
- Objective 6.4: Promote awareness of the ANSTF and its activities and provide educational briefings on ANS threats and solutions and to legislators and other decision makers

Research \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 7.1: Develop and maintain a list of ANS research priorities; communicate this list to the scientific community
- Objective 7.2: Develop and maintain guidance documents, protocols, and best management practices related to ANS
- Objective 7.3: Track the progress of research activities funded or prioritized by the ANSTF
- Objective 7.4: Support development of socio-economic research to quantify the economic impact of ANS
- Objective 7.5: Support research on interdiction methods for specific pathways of ANS
- Objective 7.6: Support efforts to identify gaps and expand research relevant to control and eradication measures to address ANS that have become established
- Objective 7.7: Encourage research to develop species invasion-risk forecast tools
- Objective 7.8: Support existing databases and global database networks

Funding \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 8.1: Secure dedicated, long-term funding for the ANSTF Strategic Plan actions
- Objective 8.2: Optimize use of current funding for ANS activities by engaging potential resources and programs within Federal agencies and additional partners
- Objective 8.3: Develop a list of ANS funding priorities

Total Funding: \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

Additional Comments (Optional):

Documents and Images (Optional)

Attachment: PymatuningBoatInspStations_FinalReport_SH2017.pdf

Additional Projects to Report?

- Yes** Please continue by entering information for the next project on the following pages
- No**

Accomplishments and Ongoing Efforts:

Activity Title:

Activity Description: Goals, activities, implementation steps, outcomes, and linkage to ANSTF Strategic Plan:

Ranavirus (RV) and Batrachochytrium dendrobatidis (Bden) are invasive, emergent infectious pathogens that have been documented in hundreds of species of amphibians, spread through the international trade of animals, and implicated in the mass mortality of over 20 species. Disease-induced mortality events often occur at breeding ponds where amphibians congregate in larger numbers. Detection can prove difficult in these areas because dead animals are quickly consumed by conspecifics or decompose before investigators can collect the tissue samples needed for genetic detection of these pathogens. However, the collection of environmental DNA (eDNA) from the water column of infected ponds has been shown to detect these pathogens before, during, and after active outbreaks. This project is designed to teach eDNA collection techniques to NGO staff, environmental educators, citizen scientists, and government agencies, and then to evaluate their effectiveness as early response units in detecting amphibian disease outbreaks.

In the spring of 2016, protocols were established to detect RV and Bden from eDNA samples by using extracted DNA from infected individuals, and filtered water samples from sites where these diseases have been detected. In the spring of 2017, the investigators conducted sessions to train participants on how to collect eDNA samples, and to instruct them on preventing disease transmission during sampling and other fieldwork. Afterwards, participants were assigned ponds that have experienced disease outbreaks, and collected eDNA samples from ponds before, and after, tadpoles completed metamorphosis. We will evaluate participant-sampling efficiency by collecting independent samples within 48-hours of participant-collected samples. In total, we will screen 12 ponds where diseases have been detected, and 12 ponds that are either in close proximity to those sites, or ponds that experience active mortality events.

This Activity supports Objectives 3.1, 3.3, and 3.5 of the ANSTF Strategic Plan by facilitating surveys and monitoring of AIS, and by increasing public involvement in EDRR programs; thereby building capacity to respond rapidly to invasions. It also addresses Objective 4.2 by providing AIS training for natural resources managers and by leveraging agency and public participation, and Objective 7.2 by developing protocols related to ANS detection and monitoring.

Status:

Start Date:

End Date, if applicable:

Lead Organization:

Partner Organization(s):

Funding Amount and Source(s)

	Source(s)	\$ Amount - FY 16	\$ Amount - FY 17	\$ Amount - FY 18
<input checked="" type="checkbox"/>	Federal Agency <input type="text" value="USFWS (via MAPAIS)"/>	<input type="text" value="0"/>	<input type="text" value="7,044"/>	<input type="text" value="0"/>
<input type="checkbox"/>	State Government <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	Local Government <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	Tribal Government <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	Academic Institution <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	NGO <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	Other <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Total Funding for Activity		<input type="text" value="0"/>	<input type="text" value="7,044"/>	<input type="text" value="0"/>

Relation to the ANSTF Strategic Plan Goals and Objectives

- Coordination \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
 - Objective 1.1: Strengthen the coordination capacity of the ANSTF
 - Objective 1.2: Evaluate the ability of statutory authorities, regulations, and programs necessary to implement ANSTF goals and objectives
 - Objective 1.3: Facilitate the development and continued effectiveness of State and interstate ANS management plans
 - Objective 1.4: Coordinate the development and implementation of ANSTF- approved species control and management plans and pathway management plans
 - Objective 1.5: Cooperate with nations that have neighboring waters and shared pathways with the United States to prevent, detect, and control ANS

- Prevention \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
 - Objective 2.1: Take steps to interdict specific pathways by developing and implementing guidance and appropriate measures
 - Objective 2.2: Facilitate use of science-based risk assessment and screening procedures to assess and prioritize pathways for the introduction of ANS or potential species of concern
 - Objective 2.3: Expand training and use of the Hazard Analysis and Critical Control Point (HACCP) program into work conducted by natural resource managers

- ERDRR \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
 - Objective 3.1: Facilitate surveys and monitoring to detect ANS
 - Objective 3.2: Make taxonomic and ecological information and expertise readily available
 - Objective 3.3: Increase public and industry involvement in early detection and rapid response programs
 - Objective 3.4: Facilitate development of rapid response contingency plans
 - Objective 3.5: Build capacity to respond rapidly to invasions

- Control \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
 - Objective 4.1: Support and evaluate ANSTF-approved control and management plans
 - Objective 4.2: Increase invasive species training for natural resource managers and leverage participation
 - Objective 4.3: Evaluate the benefits and risks associated with the commercial harvest of ANS as a means of control or eradication
 - Objective 4.4: Encourage an Integrated Pest Management (IPM) approach to manage existing ANS populations.

- Restoration \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
 - Objective 5.1: Restore impacted ecosystems
 - Objective 5.2: Address and provide technical assistance for invasive species management before, during, and after habitat restoration projects

Education \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 6.1: Increase understanding among the general public of the problems and impacts associated with ANS and actions that can be taken to prevent and control ANS
- Objective 6.2: Disseminate ANS outreach and technical guidance materials to target audiences
- Objective 6.3: Promote the use of guidance documents, best management practices and other outreach materials related to ANS
- Objective 6.4: Promote awareness of the ANSTF and its activities and provide educational briefings on ANS threats and solutions and to legislators and other decision makers

Research \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 7.1: Develop and maintain a list of ANS research priorities; communicate this list to the scientific community
- Objective 7.2: Develop and maintain guidance documents, protocols, and best management practices related to ANS
- Objective 7.3: Track the progress of research activities funded or prioritized by the ANSTF
- Objective 7.4: Support development of socio-economic research to quantify the economic impact of ANS
- Objective 7.5: Support research on interdiction methods for specific pathways of ANS3
- Objective 7.6: Support efforts to identify gaps and expand research relevant to control and eradication measures to address ANS that have become established
- Objective 7.7: Encourage research to develop species invasion-risk forecast tools
- Objective 7.8: Support existing databases and global database networks

Funding \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 8.1: Secure dedicated, long-term funding for the ANSTF Strategic Plan actions
- Objective 8.2: Optimize use of current funding for ANS activities by engaging potential resources and programs within Federal agencies and additional partners
- Objective 8.3: Develop a list of ANS funding priorities

Total Funding: \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

Additional Comments (Optional):

Documents and Images (Optional)

Attachment: eDNADetectionEmergentPathogens_ProgRpt2017_JJulianDec2017

Additional Projects to Report?

- Yes** Please continue by entering information for the next project on the following pages
- No**

Accomplishments and Ongoing Efforts:

Activity Title: Small Grant Project: An analysis of the recreational vector and associated pathways to aid in the prevention of invasive species introductions in Mid-Atlantic waterways
 Activity Description: Goals, activities, implementation steps, outcomes, and linkage to ANSTF Strategic Plan:

Recreational fishing is a known vector for the transport and dispersal of invasive species, with key pathways including live bait, angling gear, and boating gear. In Maryland, live bait has resulted in the establishment of various species of non-native worms, minnow, and crayfish, with Eurasian watermilfoil and hydrilla suspected to have been introduced via the boating gear pathway, and didymo suspected to have been introduced by angling gear. These and other invasive species have the potential to cause serious ecological and economic impacts throughout the Mid-Atlantic Region, with state agencies taking preventative measures such as boat and trailer inspections, and installing angling gear wash stations at popular fishing sites.

The objective of this study is to contribute to AIS prevention and management through a pathway analysis. A pathway analysis is prioritized in the Maryland Aquatic Nuisance Species Management Plan and can be used to identify points whose disruption could meaningfully prevent introduction of multiple invasive species. We will utilize data from a recent survey that collected information on fishing trip location and frequency in non-tidal waterways in Maryland. The geographic distribution of anglers and angler trips for each key pathway (live bait, fishing gear, boating gear) will be analyzed using ArcGIS. Pathway risk will be calculated by multiplying the percentage of anglers and angler trips involved in the pathway by the proportion of aquatic invasive species that are found in each subwatershed and can be transported by each pathway. This information will be used to rank pathways by importance using procedures developed by the National Invasive Species Council and Aquatic Nuisance Species Task Force.

This project will contribute to better management of invasive species pathways through a written report, fact sheets, a peer-reviewed publication, and targeted outreach efforts to resource managers and key recreational angling stakeholders.

This Activity supports Objective 1.3 of the ANSTF Strategic Plan by addressing the pathways analysis priority of the Maryland Aquatic Nuisance Species Management Plan, and Objective 2.2 by using science-based risk assessment procedures to assess and prioritize such pathways. It also addresses Objective 7.7 by sponsoring research to develop species invasion-risk forecast tools.

Status: Ongoing

Start Date: 1 October 2017

End Date, if applicable: 31 July 2019

Lead Organization: Morgan State University PEARL Laboratory / Dr. Scott Knoche

Partner Organization(s): Maryland Department of Natural Resources

Funding Amount and Source(s)

	Source(s)	\$ Amount - FY 16	\$ Amount - FY 17	\$ Amount - FY 18
<input checked="" type="checkbox"/>	Federal Agency USFWS (via MAPAIS)	0	0	12,070
<input type="checkbox"/>	State Government			
<input type="checkbox"/>	Local Government			
<input type="checkbox"/>	Tribal Government			
<input type="checkbox"/>	Academic Institution			
<input type="checkbox"/>	NGO			
<input type="checkbox"/>	Other			
Total Funding for Activity		0	0	12,070

Relation to the ANSTF Strategic Plan Goals and Objectives

- Coordination \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 1.1: Strengthen the coordination capacity of the ANSTF
 - Objective 1.2: Evaluate the ability of statutory authorities, regulations, and programs necessary to implement ANSTF goals and objectives
 - Objective 1.3: Facilitate the development and continued effectiveness of State and interstate ANS management plans
 - Objective 1.4: Coordinate the development and implementation of ANSTF- approved species control and management plans and pathway management plans
 - Objective 1.5: Cooperate with nations that have neighboring waters and shared pathways with the United States to prevent, detect, and control ANS
- Prevention \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 2.1: Take steps to interdict specific pathways by developing and implementing guidance and appropriate measures
 - Objective 2.2: Facilitate use of science-based risk assessment and screening procedures to assess and prioritize pathways for the introduction of ANS or potential species of concern
 - Objective 2.3: Expand training and use of the Hazard Analysis and Critical Control Point (HACCP) program into work conducted by natural resource managers
- ERDRR \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 3.1: Facilitate surveys and monitoring to detect ANS
 - Objective 3.2: Make taxonomic and ecological information and expertise readily available
 - Objective 3.3: Increase public and industry involvement in early detection and rapid response programs
 - Objective 3.4: Facilitate development of rapid response contingency plans
 - Objective 3.5: Build capacity to respond rapidly to invasions
- Control \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 4.1: Support and evaluate ANSTF-approved control and management plans
 - Objective 4.2: Increase invasive species training for natural resource managers and leverage participation
 - Objective 4.3: Evaluate the benefits and risks associated with the commercial harvest of ANS as a means of control or eradication
 - Objective 4.4: Encourage an Integrated Pest Management (IPM) approach to manage existing ANS populations.
- Restoration \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 5.1: Restore impacted ecosystems
 - Objective 5.2: Address and provide technical assistance for invasive species management before, during, and after habitat restoration projects

- Education** \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 6.1: Increase understanding among the general public of the problems and impacts associated with ANS and actions that can be taken to prevent and control ANS
 - Objective 6.2: Disseminate ANS outreach and technical guidance materials to target audiences
 - Objective 6.3: Promote the use of guidance documents, best management practices and other outreach materials related to ANS
 - Objective 6.4: Promote awareness of the ANSTF and its activities and provide educational briefings on ANS threats and solutions and to legislators and other decision makers

- Research** \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 7.1: Develop and maintain a list of ANS research priorities; communicate this list to the scientific community
 - Objective 7.2: Develop and maintain guidance documents, protocols, and best management practices related to ANS
 - Objective 7.3: Track the progress of research activities funded or prioritized by the ANSTF
 - Objective 7.4: Support development of socio-economic research to quantify the economic impact of ANS
 - Objective 7.5: Support research on interdiction methods for specific pathways of ANS3
 - Objective 7.6: Support efforts to identify gaps and expand research relevant to control and eradication measures to address ANS that have become established
 - Objective 7.7: Encourage research to develop species invasion-risk forecast tools
 - Objective 7.8: Support existing databases and global database networks

- Funding** \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 8.1: Secure dedicated, long-term funding for the ANSTF Strategic Plan actions
 - Objective 8.2: Optimize use of current funding for ANS activities by engaging potential resources and programs within Federal agencies and additional partners
 - Objective 8.3: Develop a list of ANS funding priorities

Total Funding: \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

Additional Comments (Optional):

Documents and Images (Optional)

Additional Projects to Report?

- Yes** Please continue by entering information for the next project on the following pages
- No**

Accomplishments and Ongoing Efforts:

Activity Title:

Activity Description: Goals, activities, implementation steps, outcomes, and linkage to ANSTF Strategic Plan:

The Jug Bay tidal freshwater marshes located near river mile 45 on the Patuxent River are among the most important marshes of this kind in Maryland. They provide habitat for a wide range of species including a rich fish community. Jug Bay is also a component of the Chesapeake Bay National Estuarine Research Reserve System, a program promoting among other things the protection of these important estuarine habitats. Northern Snakehead, *Channa argus*, was first discovered in Maryland in 2002, but only recently reported in the Patuxent River watershed (Maryland DNR 2012). Local angler reports and sightings have continued to increase and are now common. Information and understanding of the potential impacts of Northern Snakehead within Jug Bay is limited, but its increased presence has created a sense of urgency to control its population.

The main objectives of this study are: (1) to start the collection of data to develop a monitoring and management strategy for snakeheads within the Jug Bay area, and (2) to test different approaches to control the population. The first goal targets the collection of information about preferred habitat areas ("hotspots") used by snakehead for reproduction and over-wintering areas. Techniques proposed to gather information include trawling, electrofishing, small motor and paddle boats, stand up paddle board (SUP) and UAS (unmanned aerial systems). Once "hotspots" are identified, the second goal is to test the effectiveness of different control approaches such as egg and juvenile removals and targeted fishing.

Because of the nature of this project, the involvement of multiple partners and community members is fundamental to our success. Outreach will be an important component of this study, including communication of results to the public, youth outreach events, engagement of the angler community, and involvement of the public through a monitoring citizen science program.

This Activity supports Objectives 3.1, 3.3, and 3.5 of the ANSTF Strategic Plan by facilitating surveys and monitoring of AIS, and by increasing public involvement in EDRR programs; thereby building capacity to respond rapidly to invasions. It also addresses Objective 4.2 by providing AIS training for natural resources managers and by leveraging agency and public participation, and Objective 7.6 by expanding research relevant to control and eradication measures to address ANS that have become established.

Status:

Start Date:

End Date, if applicable:

Lead Organization:

Partner Organization(s):

Funding Amount and Source(s)

	Source(s)	\$ Amount - FY 16	\$ Amount - FY 17	\$ Amount - FY 18
<input checked="" type="checkbox"/>	Federal Agency <input type="text" value="USFWS (via MAPAIS)"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="6,885"/>
<input type="checkbox"/>	State Government <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	Local Government <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	Tribal Government <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	Academic Institution <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	NGO <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	Other <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Total Funding for Activity		<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="6,885"/>

Relation to the ANSTF Strategic Plan Goals and Objectives

- Coordination \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 1.1: Strengthen the coordination capacity of the ANSTF
 - Objective 1.2: Evaluate the ability of statutory authorities, regulations, and programs necessary to implement ANSTF goals and objectives
 - Objective 1.3: Facilitate the development and continued effectiveness of State and interstate ANS management plans
 - Objective 1.4: Coordinate the development and implementation of ANSTF- approved species control and management plans and pathway management plans
 - Objective 1.5: Cooperate with nations that have neighboring waters and shared pathways with the United States to prevent, detect, and control ANS
- Prevention \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 2.1: Take steps to interdict specific pathways by developing and implementing guidance and appropriate measures
 - Objective 2.2: Facilitate use of science-based risk assessment and screening procedures to assess and prioritize pathways for the introduction of ANS or potential species of concern
 - Objective 2.3: Expand training and use of the Hazard Analysis and Critical Control Point (HACCP) program into work conducted by natural resource managers
- ERDRR \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 3.1: Facilitate surveys and monitoring to detect ANS
 - Objective 3.2: Make taxonomic and ecological information and expertise readily available
 - Objective 3.3: Increase public and industry involvement in early detection and rapid response programs
 - Objective 3.4: Facilitate development of rapid response contingency plans
 - Objective 3.5: Build capacity to respond rapidly to invasions
- Control \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 4.1: Support and evaluate ANSTF-approved control and management plans
 - Objective 4.2: Increase invasive species training for natural resource managers and leverage participation
 - Objective 4.3: Evaluate the benefits and risks associated with the commercial harvest of ANS as a means of control or eradication
 - Objective 4.4: Encourage an Integrated Pest Management (IPM) approach to manage existing ANS populations.
- Restoration \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 5.1: Restore impacted ecosystems
 - Objective 5.2: Address and provide technical assistance for invasive species management before, during, and after habitat restoration projects

Education \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 6.1: Increase understanding among the general public of the problems and impacts associated with ANS and actions that can be taken to prevent and control ANS
- Objective 6.2: Disseminate ANS outreach and technical guidance materials to target audiences
- Objective 6.3: Promote the use of guidance documents, best management practices and other outreach materials related to ANS
- Objective 6.4: Promote awareness of the ANSTF and its activities and provide educational briefings on ANS threats and solutions and to legislators and other decision makers

Research \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 7.1: Develop and maintain a list of ANS research priorities; communicate this list to the scientific community
- Objective 7.2: Develop and maintain guidance documents, protocols, and best management practices related to ANS
- Objective 7.3: Track the progress of research activities funded or prioritized by the ANSTF
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- Objective 7.5: Support research on interdiction methods for specific pathways of ANS3
- Objective 7.6: Support efforts to identify gaps and expand research relevant to control and eradication measures to address ANS that have become established
- Objective 7.7: Encourage research to develop species invasion-risk forecast tools
- Objective 7.8: Support existing databases and global database networks

Funding \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 8.1: Secure dedicated, long-term funding for the ANSTF Strategic Plan actions
- Objective 8.2: Optimize use of current funding for ANS activities by engaging potential resources and programs within Federal agencies and additional partners
- Objective 8.3: Develop a list of ANS funding priorities

Total Funding: \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

Additional Comments (Optional):

Documents and Images (Optional)

Additional Projects to Report?

- Yes** Please continue by entering information for the next project on the following pages
- No**

Accomplishments and Ongoing Efforts:

Activity Title:

Activity Description: Goals, activities, implementation steps, outcomes, and linkage to ANSTF Strategic Plan:

Invasive species are a threat to biodiversity and economic interests. Early detection of invasion allows for a more rapid response and increases the likelihood of successful remediation of the invaded ecosystem. *Potamopyrgus antipodarum*, the New Zealand mud snail (NZMS), is a global invader characterized by distinct asexual lineages. NZMS invasion is cause for concern as it has been linked to harmful effects in invaded ecosystems. In the eastern US, NZMS was first noted in Lake Ontario in 1991. NZMS has since been identified in Lake Erie, rivers in upstate New York, and in central Pennsylvania, but the full extent of the NZMS northeastern invasion is both uncertain and likely more extensive.

We propose to further characterize the eastern NZMS invasion through the use of environmental DNA (eDNA). eDNA represents DNA molecules shed from organisms' skin, feces, or other sources, and is maintained for short periods of time in the areas in which the organisms are active. We will sample the water of potential invasion sites, filtering eDNA out and returning the water to the sample sites. In a lab decontaminated of NZMS DNA, we will extract the DNA for use in quantitative PCR. We will make use of primers proven to be both effective and specific for detection of NZMS. Quantitative PCR will allow us to both detect the presence of NZMS and estimate the currently active population at the sample site. These techniques have been proven in lab and at known invasion sites, but have not previously been applied for early detection of NZMS.

Results of this study will be disseminated to relevant government agencies to aid invasion prevention and remediation efforts. More broadly, demonstrating the application of eDNA techniques for early detection will help develop a cutting-edge advantage in ecosystem monitoring.

This Activity supports Objective 3.1 of the ANSTF Strategic Plan by facilitating surveys and monitoring of AIS. It also addresses Objectives 7.2 and 7.6 by developing protocols related to ANS detection and monitoring, and by expanding research relevant to control and eradication measures to address ANS that have become established.

Status:

Start Date:

End Date, if applicable:

Lead Organization:

Partner Organization(s):

Funding Amount and Source(s)

	Source(s)	\$ Amount - FY 16	\$ Amount - FY 17	\$ Amount - FY 18
<input checked="" type="checkbox"/>	Federal Agency <input type="text" value="USFWS (via MAPAIS)"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="15,000"/>
<input type="checkbox"/>	State Government <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	Local Government <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	Tribal Government <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	Academic Institution <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	NGO <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	Other <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Total Funding for Activity		<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="15,000"/>

Relation to the ANSTF Strategic Plan Goals and Objectives

- Coordination \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 1.1: Strengthen the coordination capacity of the ANSTF
 - Objective 1.2: Evaluate the ability of statutory authorities, regulations, and programs necessary to implement ANSTF goals and objectives
 - Objective 1.3: Facilitate the development and continued effectiveness of State and interstate ANS management plans
 - Objective 1.4: Coordinate the development and implementation of ANSTF- approved species control and management plans and pathway management plans
 - Objective 1.5: Cooperate with nations that have neighboring waters and shared pathways with the United States to prevent, detect, and control ANS
- Prevention \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 2.1: Take steps to interdict specific pathways by developing and implementing guidance and appropriate measures
 - Objective 2.2: Facilitate use of science-based risk assessment and screening procedures to assess and prioritize pathways for the introduction of ANS or potential species of concern
 - Objective 2.3: Expand training and use of the Hazard Analysis and Critical Control Point (HACCP) program into work conducted by natural resource managers
- ERDRR \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 3.1: Facilitate surveys and monitoring to detect ANS
 - Objective 3.2: Make taxonomic and ecological information and expertise readily available
 - Objective 3.3: Increase public and industry involvement in early detection and rapid response programs
 - Objective 3.4: Facilitate development of rapid response contingency plans
 - Objective 3.5: Build capacity to respond rapidly to invasions
- Control \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 4.1: Support and evaluate ANSTF-approved control and management plans
 - Objective 4.2: Increase invasive species training for natural resource managers and leverage participation
 - Objective 4.3: Evaluate the benefits and risks associated with the commercial harvest of ANS as a means of control or eradication
 - Objective 4.4: Encourage an Integrated Pest Management (IPM) approach to manage existing ANS populations.
- Restoration \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 5.1: Restore impacted ecosystems
 - Objective 5.2: Address and provide technical assistance for invasive species management before, during, and after habitat restoration projects

Education \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 6.1: Increase understanding among the general public of the problems and impacts associated with ANS and actions that can be taken to prevent and control ANS
- Objective 6.2: Disseminate ANS outreach and technical guidance materials to target audiences
- Objective 6.3: Promote the use of guidance documents, best management practices and other outreach materials related to ANS
- Objective 6.4: Promote awareness of the ANSTF and its activities and provide educational briefings on ANS threats and solutions and to legislators and other decision makers

Research \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 7.1: Develop and maintain a list of ANS research priorities; communicate this list to the scientific community
- Objective 7.2: Develop and maintain guidance documents, protocols, and best management practices related to ANS
- Objective 7.3: Track the progress of research activities funded or prioritized by the ANSTF
- Objective 7.4: Support development of socio-economic research to quantify the economic impact of ANS
- Objective 7.5: Support research on interdiction methods for specific pathways of ANS3
- Objective 7.6: Support efforts to identify gaps and expand research relevant to control and eradication measures to address ANS that have become established
- Objective 7.7: Encourage research to develop species invasion-risk forecast tools
- Objective 7.8: Support existing databases and global database networks

Funding \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 8.1: Secure dedicated, long-term funding for the ANSTF Strategic Plan actions
- Objective 8.2: Optimize use of current funding for ANS activities by engaging potential resources and programs within Federal agencies and additional partners
- Objective 8.3: Develop a list of ANS funding priorities

Total Funding: \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

Additional Comments (Optional):

Documents and Images (Optional)

Additional Projects to Report?

- Yes** Please continue by entering information for the next project on the following pages
- No**

Accomplishments and Ongoing Efforts:

Activity Title:

Activity Description: Goals, activities, implementation steps, outcomes, and linkage to ANSTF Strategic Plan:

Snakeheads, particularly Northern Snakehead, *Channa argus*, have experienced dramatic range expansions in North America over the past two decades. Commensurate with this expansion has come publicity via a plethora of popular media outlets and a handful of peer-reviewed journal articles resulting from research by various state, federal, and academic institutions. This controversial group of fish has captivated audiences around the globe, but a great deal of misinformation remains in the public domain due to misconceptions and limited conveyance of legitimate biological and ecological information from the scientific community. Additionally, as *C. argus* continues to spread along the mid-Atlantic and central United States, resource managers from newly colonized and neighboring states desire information to inform expectations and guide implementation of management strategies.

Despite some progress in describing certain aspects of snakehead biology and, to a lesser extent, ecology, the list of unknowns remains great. Snakeheads are often implicated as a vector of ecosystem destruction and/or restructuring, yet nearly no conclusive evidence of such exists. Furthermore, various facets of spawning behavior, early life history, and recruitment are poorly understood at best. There is a paucity of studies describing interactions between snakeheads and other species, and their ecosystem effects are thus largely unknown.

The goal of the symposium is to foster a better understanding of and improve management knowledge of these species. To achieve this goal, we have several objectives which include: the symposium in May 2018 providing a germane, valuable program relevant to a broad audience; a registration that is economically reasonable; and a published book of peer-reviewed proceedings serving as a resource on current snakehead information. Presenters will be encouraged, but not be required, to publish within this volume. Additional chapters on topics not presented at the symposium are possible.

This Activity supports Objectives 1.3, 1.4, and 4.1 of the ANSTF Strategic Plan by enhancing effectiveness and implementation of the ANSTF-approved Snakehead Management Plan and the applicable ANSTF-approved State ANS Management Plans. By facilitating interagency and international/interstate exchange of information, it also addresses Objectives 3.2, 4.2, 6.1, 6.2, 6.3, 6.4, 7.2, 7.6, and 7.8.

Status:

Start Date:

End Date, if applicable:

Lead Organization:

Partner Organization(s):

Funding Amount and Source(s)

	Source(s)	\$ Amount - FY 16	\$ Amount - FY 17	\$ Amount - FY 18
<input checked="" type="checkbox"/>	Federal Agency <input type="text" value="USFWS (via MAPAIS)"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="7,500"/>
<input type="checkbox"/>	State Government <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	Local Government <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	Tribal Government <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	Academic Institution <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	NGO <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	Other <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Total Funding for Activity		<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="7,500"/>

Relation to the ANSTF Strategic Plan Goals and Objectives

- Coordination** \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 1.1: Strengthen the coordination capacity of the ANSTF
 - Objective 1.2: Evaluate the ability of statutory authorities, regulations, and programs necessary to implement ANSTF goals and objectives
 - Objective 1.3: Facilitate the development and continued effectiveness of State and interstate ANS management plans
 - Objective 1.4: Coordinate the development and implementation of ANSTF- approved species control and management plans and pathway management plans
 - Objective 1.5: Cooperate with nations that have neighboring waters and shared pathways with the United States to prevent, detect, and control ANS
- Prevention** \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 2.1: Take steps to interdict specific pathways by developing and implementing guidance and appropriate measures
 - Objective 2.2: Facilitate use of science-based risk assessment and screening procedures to assess and prioritize pathways for the introduction of ANS or potential species of concern
 - Objective 2.3: Expand training and use of the Hazard Analysis and Critical Control Point (HACCP) program into work conducted by natural resource managers
- ERDRR** \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 3.1: Facilitate surveys and monitoring to detect ANS
 - Objective 3.2: Make taxonomic and ecological information and expertise readily available
 - Objective 3.3: Increase public and industry involvement in early detection and rapid response programs
 - Objective 3.4: Facilitate development of rapid response contingency plans
 - Objective 3.5: Build capacity to respond rapidly to invasions
- Control** \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 4.1: Support and evaluate ANSTF-approved control and management plans
 - Objective 4.2: Increase invasive species training for natural resource managers and leverage participation
 - Objective 4.3: Evaluate the benefits and risks associated with the commercial harvest of ANS as a means of control or eradication
 - Objective 4.4: Encourage an Integrated Pest Management (IPM) approach to manage existing ANS populations.
- Restoration** \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 5.1: Restore impacted ecosystems
 - Objective 5.2: Address and provide technical assistance for invasive species management before, during, and after habitat restoration projects

Education \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 6.1: Increase understanding among the general public of the problems and impacts associated with ANS and actions that can be taken to prevent and control ANS
- Objective 6.2: Disseminate ANS outreach and technical guidance materials to target audiences
- Objective 6.3: Promote the use of guidance documents, best management practices and other outreach materials related to ANS
- Objective 6.4: Promote awareness of the ANSTF and its activities and provide educational briefings on ANS threats and solutions and to legislators and other decision makers

Research \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 7.1: Develop and maintain a list of ANS research priorities; communicate this list to the scientific community
- Objective 7.2: Develop and maintain guidance documents, protocols, and best management practices related to ANS
- Objective 7.3: Track the progress of research activities funded or prioritized by the ANSTF
- Objective 7.4: Support development of socio-economic research to quantify the economic impact of ANS
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- Objective 7.8: Support existing databases and global database networks

Funding \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 8.1: Secure dedicated, long-term funding for the ANSTF Strategic Plan actions
- Objective 8.2: Optimize use of current funding for ANS activities by engaging potential resources and programs within Federal agencies and additional partners
- Objective 8.3: Develop a list of ANS funding priorities

Total Funding: \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

Additional Comments (Optional):

Documents and Images (Optional)

Additional Projects to Report?

- Yes** Please continue by entering information for the next project on the following pages
- No**

Accomplishments and Ongoing Efforts:

Activity Title:

Activity Description: Goals, activities, implementation steps, outcomes, and linkage to ANSTF Strategic Plan:

Despite the fact that lake and reservoir managers in the Mid-Atlantic face many AIS challenges, there is currently very limited cooperation and coordination between managers within and between states as to how to identify and react to these issues. The Maryland Department of Natural Resources (DNR) through this project will plan and conduct an interstate Mid-Atlantic Lake Forum focusing on AIS issues and management. This forum will bring together professionals from Maryland and surrounding states to discuss aquatic invasive species, encourage information exchange regarding distribution and control of AIS species currently found within the region, and facilitate multi-jurisdictional cooperation in controlling the spread of aquatic invasive species across state lines. Lake managers and AIS experts will discuss AIS issues within each state, identify red alert species of concern, and work on solutions to minimize the spread of those species. Presentations will focus on control methods used in each state, innovations for minimizing introductions, and herbicide use; and will include a roundtable discussion that may facilitate development of a regional action plan. This regional plan would be used to enhance information sharing among agencies, encourage all agencies to report their documented occurrences of invasive species, and facilitate development of a regional interactive map that can track the spread of invasive species (as currently being pursued between MAPAIS and USGS).

This Activity supports Objectives 1.3, 3.2, 3.3, and 3.4 of the ANSTF Strategic Plan by facilitating coordination among MAPAIS agencies and partners regarding AIS prevention, detection, and control in lakes of the Mid-Atlantic Region. It also addresses Objectives 4.2, 6.1, 6.2, 6.3, and 6.4 by providing educational materials to the public, other target audiences, and natural resource managers regarding lake management AIS issues and best management practices.

Status:

Start Date:

End Date, if applicable:

Lead Organization:

Partner Organization(s):

Funding Amount and Source(s)

	Source(s)	\$ Amount - FY 16	\$ Amount - FY 17	\$ Amount - FY 18
<input checked="" type="checkbox"/>	Federal Agency <input type="text" value="USFWS (via MAPAIS)"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="4,550"/>
<input type="checkbox"/>	State Government <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	Local Government <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	Tribal Government <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	Academic Institution <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	NGO <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/>	Other <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Total Funding for Activity		<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="4,550"/>

Relation to the ANSTF Strategic Plan Goals and Objectives

- Coordination \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 1.1: Strengthen the coordination capacity of the ANSTF
 - Objective 1.2: Evaluate the ability of statutory authorities, regulations, and programs necessary to implement ANSTF goals and objectives
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- Restoration \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18
- Objective 5.1: Restore impacted ecosystems
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Education \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

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Research \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 7.1: Develop and maintain a list of ANS research priorities; communicate this list to the scientific community
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Funding \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

- Objective 8.1: Secure dedicated, long-term funding for the ANSTF Strategic Plan actions
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Total Funding: \$ Amount FY 16 \$ Amount FY 17 \$ Amount FY 18

Additional Comments (Optional):

Documents and Images (Optional)

Additional Projects to Report?

- Yes
- No Please save a copy of this form for you records before submitting.