GULF & SOUTH ATLANTIC REGIONAL PANEL
ON AQUATIC INVASIVE SPECIES
MINUTES
Wednesday, April 10, 2013 & Thursday, April 11, 2013
Atlanta, GA

On Wednesday, April 10, 2013 Chairman Hartman called the meeting to order at 8:30 a.m. The meeting began with introductions of the members and guests. The following were in attendance:

Members & Proxies
James Ballard, GSMFC, Ocean Springs, MS
Tim Bonvechio, GA DNR, Waycross, GA
Robert Bourgeois, LA Dept. of Wildlife & Fisheries, Baton Rouge, LA
Earl Chilton, TPWD, Austin, TX
Rob Emens, NC DENR, Raleigh, NC
Chris Furqueron, National Park Service, Atlanta, GA
Lisa Gonzalez, HARC, The Woodlands, TX
Leslie Hartman, TPWD, Palacios, TX
Jeffrey Herod, USFWS, Atlanta, GA
Chuck Jacoby, Indian River Lagoon National Estuary Program, Palatka, FL
David Knott, At-Large Member, Charleston, SC
Herb Kumpf, At-Large Member, Stuart, FL
Robert McMahon, UT Arlington, Arlington, TX
Dennis Riecke, MS DWFP, Jackson, MS
Don Schmitz, FWC, Tallahassee, FL
John Teem, FL DOA, Tallahassee, FL

Staff
Ali Catchot, GSMFC, Ocean Springs, MS

Others
Lad Akins, REEF, Key Largo, FL
Susan Mangin, USFWS, Arlington, VA
Gregory Moyer, USFWS, Warm Springs, GA
Mike Pursley, MDMR, Biloxi, MS

Public Comment
Chairman **Hartman** provided the opportunity for public comment. No public comments were received.

Adoption of Agenda
A motion to adopt the amended agenda was made, and passed unanimously.

Approval of Minutes

The minutes of the meeting of the October 11, 2012 meeting in New Orleans, LA were presented for approval.

A motion was made to approve the minutes. The motion was seconded, and the motion passed.

Overview of the Asian Swamp Eel Project

J. Herod gave a PowerPoint Presentation entitled "Local Area AIS Control Plan: Swamp Eel".

Asian swamp eels are similar to the American eel, lampreys, and salamanders. Possible sources of introduced populations are from Korea, Japan and China. They are opportunist predators, consuming a wide range of prey, including aquatic invertebrates. The eels spawn in the summer. They are hermaphroditic. They mature as females, and some later become males. Their populations are dominated by females. Their habitat is tropical and temperate freshwater systems. They have a high tolerance for temperature change and have the potential to spread across a large portion of the United States. Swamp eels also pose a threat to humans and other vertebrates because they are vectors of non-native parasites. Live swamp eels sold in markets in Southeast Asia are commonly affected with nematodes of the genus *Gnathostoma*. The eels are also a general predator that feed on largemouth bass.

In 1994, eels were found in a Chattahoochee Nature Center pond. It is thought that they were spread into surrounding ponds and marsh areas by dumping. In 2000, eels were found in three more ponds. In 2005, eels were persistent in three ponds, and the Chattahoochee River marsh area. Leaf litter traps were set out, and many juvenile eels were found in them.

Ponds have been renovated by outflow alteration to deepen the water and alter the eel habitat to make it unfavorable. However, no follow-up was done.

In 2008, specimens were collected from mid-July to late August in the Chattahoochee River Marsh area. Otoliths were examined to determine daily age and hatching timing.

Future plans include: Reinvigorate interest by NPS and USFWS in 2012; determine current distribution in the Chattahoochee River and tributaries; understand population demographics for a control project; gather a panel of experts to inform the plan; develop a suite of population control measures; develop an exploit model; monitor population demographics for response.

Overview of the Satilla River Flathead Removal Project

Bonvechio gave a PowerPoint Presentation entitled "Satilla River Flathead Catfish Removal Spring 2013 Update".

The first confirmed flathead catfish was caught in June 1996. It was tied back to initial 1994 year-class with lapilla otoliths.

The Rooster Red Sunfish have almost disappeared from the Satilla River due to consumption by flathead catfish. Impacts on other native fish species have also occurred and were documented in publications.

There are no regulations in place for the removal of flathead catfish from the Satilla River. A full-time removal crew was assembled by the GA DNR in 2006. Volunteers also assist with the removal project.

Flatheads are captured using boats rigged with low amperage electrofishing. As the catfish come to the surface, they are caught in nets and removed. Electrofishing is broken down into 11 river stretches encompassing a total of 129 river km.

To date, 45,043 fish have been removed from 1996-2012. All proportional stock densities have declined. Mortality rates have been high.

There appears to be a shift in sexual maturity.

An Atlantic Sturgeon was found in the stomach of a flathead catfish.

Blue catfish were captured in 2011 in the Satilla River, possibly via inter-coastal. None were found in 2012.

Redbreast sunfish have been impacted by the flathead catfish invasion. Their sizes have been reduced significantly.

Maintenance control of the flathead catfish in the Satilla River is possible. An electrofishing removal program is a reasonable management option for state agencies.

Experimental Use of a UAV Camera Platform for Detection of AIS

Pursley gave a PowerPoint Presentation entitled "Experimental Use of a UAV Camera Platform for Remote Early Detection of AIS". Post-Katrina salvinia eradication efforts are ongoing. There are 1,000s of acres of inaccessible marsh habitat possibly harboring giant salvinia. They were able to remain dormant from 2005-2011. Other small patches may remain hidden in Pascagoula River marsh. Conventional water craft cannot access the areas.

Marsh searches can be extended by using a remote controlled DraganFlyer X6 helicopter. It is rechargeable, stable, and easy to fly. It takes 10MP geo-referenced images. The cost is approximately $27,500.

An unanticipated setback occurred after the order was placed for the helicopter. State and federal agency use in NAS is regulated. Commercial use is prohibited. These FAA regulations were not learned of until after the order for the helicopter was placed. A COA (Certificate of Authorization) is required. The cost to hire a contractor to apply for a COA is over $20,000. Six months later, the COA was obtained. However, there were conditions attached to the COA that were not revealed prior to application. An experienced and qualified UAV crew was found to instruct on how to fly the helicopter.

Several flights were performed. Small clusters of salvinia were detected at altitudes of 20-30 feet.

Update – Reproductive Sterility as a Tool for Prevention/Control of AIS

Teem gave a PowerPoint Presentation entitled "Reproductive Sterility as a Tool for Prevention and Control of Invasive Aquatics".

The U.S. currently allows only *P. brigesii* to be sold and shipped in the U.S. They are produced in Florida and leave aquatic plants intact. However, *Asolene spixi* eats aquatic plants and is no longer in the trade. Studies are being conducted to determine if reproductively-sterile *P. brigesii* and *A. spixi* can be produced as new ornamental snail products. Sterile *P. brigesii* could be sold without any requirement for USDA approval. Sterile *A. spixi* cannot be sold without USDA approval. The question is whether or not there would be a potential market for these two sterile snails.

Irradiation of chromosomes produces translocations that pair abnormally during meiosis. The snails are irradiated, the irradiated snail is mated to a wildtype, the eggs are collected, and a determination is done to see if eggs hatch into snails that survive. The viability of irradiated *P. brigesii* adults decreases at doses of radiation above 130 Gy. Mortality is high when snails are irradiated to produce translocation chromosomes.

Directed recombination is being investigated as an alternative to irradiation treatment to produce chromosomal translocations. Getting DNA components into snails is done by transfecting DNA into snail tissue, then mating the transfected snail. The eggs are collected for DNA. The gene expression is detected, and the DNA is detected by PCR. Studies are being done to determine if GFP plasmid DNA can be introduced into snails so that they can be easily identified by green fluorescence. Males transfected with DNA are viable and fertilize females to produce viable eggs. GFP-transfected snail hatchlings can be viewed under UV light to look for green fluorescence. No green GFP-positive hatchlings have been detected as of yet.

Update – Trojan Y Chromosome Eradication of Invasive Fish Project

Teem gave a PowerPoint Presentation entitled "Trojan Y Chromosome Eradication of Invasive Fish: Sex-specific DNA Markers for Tilapia".

Females with two Y chromosomes produce only progeny, half of which are Myy. Myy males are viable and produce only male offspring. Four different matings are possible (Fyy; Fxx; Mxy; Myy), which leads to increased male production. The male/female ratio will increase over time if Fyy is added. The addition of a Trojan Y female (Fyy) to a target population will cause females (Fxx) to become extinct over time. The carrying capacity of the system becomes occupied by Myy fish (males with two Y chromosomes).

Sex-specific DNA markers can greatly reduce the time required to generate YY fish by allowing YY genetypes to be detected by DNA analysis instead of test crosses.

The production of YY fish requires selective breeding and the use of hormone-induced sex reversal techniques.

For some fish, sex-specific DNA markers have been identified by using the RAPD PCR method. Three invasive fish species were screened for sex-specific DNA markers using RAPD PCR: Nile Tilapia; African Jewelfish: Silver Carp. African Jewelfish have been the first priority because broodstock are being developed for this species by USGS. A DNA pool is created from only females, and another from only males. Each pool is tested with PCR using a collection of short DNA primers that will amplify sequences at different locations in the genome. For each primer, female-specific DNA amplified products are compared with male-specific amplified products using gel electrophoresis. The goal is to find a primer that gives a band in one DNA pool, but not the other pool.

No sex-specific markers have been identified as yet for any of the three species. Experiments to determine the sex-determination system for African Jewelfish are in progress in collaboration with USGS.

Discussion of the Draft GSARP Research Priorities List

Ballard spoke on the creation of the GSARP Research Priorities List. Eighteen priority items are listed, and each one was discussed by the committee members. After numerous suggestions from the members, changes were made to the list. It was also decided that the name of the list should be changed to "GSARP Research Management Priorities".

Ballard also provided a list of GSARP ANS research needs by state, and the members discussed the list. Suggestions were made, and it was decided that further discussion would be done during the work group session on Thursday, April 11.

Update on AFS AIS Resolution

Riecke reported that the Resolution on the Federal Funding for Programs to Prevent, Control, and Manage Aquatic Invasive Species was adopted by the Southern Division American Fisheries Society on January 27, 2012. The key provision urges Congress of the U.S. to appropriate $59,000,000 funding on an annual basis for Regional Panels and State/Interstate Plans for prevention, control, and management of nonnative aquatic invasive species. A similar Resolution was adopted by the Parent Society of the American Fisheries Society on March 6, 2013. The key provision urges Congress of the U.S. to appropriate $61,000,000 on an annual basis to fund the Regional Panels, the State/Interstate Plans, the Quagga-Zebra Mussel Action Plan, and to fund the USGS Aquatic Nuisance Species Database for prevention, control, and management of nonnative aquatic invasive species. It was adopted by the Southern Division American Fisheries Society on February 8, 2013. The key provision urges Congress of the U.S. to appropriate $286,000,000 over 20 years to fully implement all the strategies and recommendations contained in the *Management and Control Plan for the Bighead, Black, Grass, and Silver Carps in the United States* as approved by the Aquatic Nuisance Species Tack Force in 2007. This resolution is currently being considered by the AFS Parent Society Resolutions Committee. It will be sent to the AFS membership in 2013 for a 30-day online comment period and a 30-day voting period. If passed, it will be posted online and published in *Fisheries*.

Riecke provided a written synopsis of the resolutions in each member's folder, and listed links to view the resolutions, justification, and cited literature.

National Invasive Lionfish Prevention and Management Plan Update

Ballard reported that the update is near completion, and reminded the members to email their drafts to him.

The Plan will hopefully be finalized this summer, and will be presented to the Task Force for approval at their Fall meeting.

FY12 USFWS Region 4 AIS Program: Collaboration, Coordination, and Cooperation on AIS Issues

Herod gave a PowerPoint Presentation entitled "FY2012 USFWS R4 AIS Program: Collaboration, Coordination, and Cooperation on AIS Issues". He reported that there has been a lot of progress on State ANS Management Plans in the last 3-4 years. He stated that there are 41 approved plans – 38 state, and 3 interstate.

There have been 49 new species introduced to Region 4 since 2000. These species have never been collected from any of the states in Region 4. Since 2000, 160 species were recorded as new to a particular state, either spread of an established population, or new introductions. Puerto Rico and the Virgin Islands experienced the largest proportional increases. In terms of total number of species, the two highest were Florida and Puerto Rico.

Early detection and planning efforts include: the development and enhancement of molecular detection and surveillance tools for invasive fishes in freshwater habitats in the southeast; the expansion of USFWS eDNA monitoring capabilities for aquatic invasive species in Region 4; refinement of NAS data for SARP use.

Control and research include: the Mississippi Bight Lionfish Response Unit, which is a joint taskforce to combat lionfish populations in the Gulf of Mexico; phylogeographic analyses to identify dispersing, reproducing and founding populations of Asian tiger shrimp; investigating management of invasive apple snails by using chemical and biological control methods; biology and ecology of non-native aquatic species in Florida.

Herod explained that a regional biosecurity framework is needed that consists of: an EDRR Plan; ICS training; regional perspective on national issues; surveys; control plans and pilot projects; species-specific risk assessments/management; pathway risk assessments/management; GSARP priority species and science needs.

Future directions for FY2013-2014 in the southeast include WIT training, lionfish workshops, Asian carp impacts/potential spread, eDNA, National Invasive Lionfish PMP, snakehead NMP, and a national Asian carp surveillance plan.

Herod stated that continued support is needed for state ANS coordinators and invasive species plans/strategies; to prevent AIS introductions regionally through RA/RM focused on pathways; to provide resources and education to develop capacity in the region for prevention, detection,

and control; to test all biosecurity elements on a suite of species; capacity building for ED (eDNA and WIT); to complete the EDRR plan and find resources to run drills.

Critical Keys to Success Learned from Florida's Aquatic and Wetland Invasive Plant Management Program in Public Natural Areas and Why Invasive Plant Research and Outreach are Essential for Advancement

Schmitz gave a PowerPoint Presentation entitled "10 Critical Keys to Success Learned from Florida's Aquatic and Wetland Invasive Plant Management Program 1970 – 2012".

Aquatic invasive plants and animals were introduced into Florida through different pathways: captive wildlife escaped or were released; tourists; fish farms and aquatic plant nurseries; ballast water; cultural introductions; contaminates. Florida has a large ornamental plant industry. There have been over 1 thousand plant species introduced into Florida, and 124 are considered invasive. Several invasive plant species have affected over 1 million acres.

Critical Key #1 is to designate a lead state or provincial agency that is responsible for IPM. The Florida FWCC is designated by the Florida Legislature as the lead agency for coordinating and funding two statewide control programs on PCLs and waterways for invasive aquatic and wetland plants and upland invasive plants. The lead agency coordinates management operations; coordinates inventories; handles statewide goals, plans, and priority fund distribution; reduces administrative costs.

Critical Key #2 is that IPM funding is the key to success. Funding in the amount of $23 million has been spent for FWC aquatic plant management, and $6 million on upland plant management. The overall IPM goal should be defined. In Florida, maintenance control lowers ecological impacts, lowers cost to taxpayers, and lowers the amount of herbicides used.

Critical Key #3 is to identify the problem, and prevent and rapidly respond to new invasions. FWC conducts aerial surveys and on-site ground surveys and inventories of aquatic plants in approximately 450 public waterways covering over 2 million acres. The Florida Invasive Species Partnership has developed an Early Detection & Distribution Mapping System. There is also an "IveGot1" app for iPhones.

Critical Key #4 is to prioritize species for management that are causing the most harm. The greatest ecological impacts of invasive species in Florida are species that modify habitats, and species that produce novel habitats. Overall management funding priorities should be established. Highly invasive and disruptive plant species should be targeted. Critical wildlife habitat areas or imperiled species need to be protected. Plants blocking access and navigation, and floating plants such as hyacinth and lettuce need to be priorities.

Critical Key #5 is that local participation and ownership of the issue is critical to success. Regional management working groups should be established. Florida's regional working groups develop local management plans, establish local control priorities, assist with local surveillance of invasive plant populations, and help raise local public awareness about invasive plants. Project site managers should be assisted by establishing licensed applicators and IPM contractors and specific regions. The local site manager would have oversight of the contractors. An

herbicide bank should be established for site maintenance of previous management projects, and statewide bid contracts to reduce herbicide costs. Florida has spent over $5 million, and treated 185,000 total treated acres.

Critical Key # 6 is to not overlook private lands. The Florida Invasive Species Partnership (FISP) is a collaboration of federal, state, and local agencies, along with non-government organizations, with a stake in managing invasive non-native species in Florida. The goal is to connect private landowners and public land managers with invasive species expertise and assistance programs across boundaries. Both public and private stakeholders can benefit from collaborative efforts to reduce the threat.

Critical Key# 7 is that invasive plant control efforts must balance competing management interests. Some shared uses and competing interests are lake homeowners' access, endangered species habitat, recreational users, flood and mosquito control, power generation, navigation, potable water supply, fishermen, and duck hunters.

Critical Key# 8 is that regional invasive species research infrastructure must be developed. The total spent for invasive plant management research in Florida in the 1970s was $5.2 million. From 2000-2010, the total spent was $11.5 million.

Critical Key# 9 is that biocontrols can help. From 1970-2012, funded biocontrol research resulted in 12 plant species being targeted for biocontrol research, over 900 insects/pathogens discovered and evaluated, 22 insects/pathogens released, and three insects that may be released in 2014-2015. In March 2010, the USDA-ARS released a new biocontrol insect, *Megamelus scutellaris* (a plant hopper) that targets water hyacinth. The nymphs and adults feed on the hyacinth, which creates a choke point between the leaf and the petiole. Released biocontrol agents onto melaleuca have reduced their reproductive ability by over 90% by prohibiting their seed capsule production.

Critical Key#10 is that outreach must be generational. FWC Outreach hosts research reviews, tracks IPM research in the Southeast, and publishes an annual newsletter. FWC funds education initiatives such as their 3-day "Plant Camps" for science teachers. The camp covers plant and animal invasive species and provides student lessons, activities, and materials. A public "Plant Management in Florida Waters" website was created that provides information about developing management plans, and has an encyclopedic guide to plant management in Florida waterways. The site covers over 400 topics.

Aquatic Nuisance Species Task Force Update

Mangin reported that there are now 41 state ANS management plans approved. The Task Force has approved Recreational Guidelines and Water Garden Guidelines. The next step is to have them put into the Federal Register for public comment.

The Task Force Prevention Committee will provide guidance for pathway management plans, and a list of pathways to be considered for plan development.

The Task Force will be holding a 2-day webinar in late Spring that will focus on the highest priority issues of the Task Force. More information on the webinar will be provided to the panel members in the near future.

The Snakehead Plan is near completion.

Funding is being cut by at least 6.8%. Funding for panels will tentatively be distributed in May 2013.

Invasive Species Advisory Committee Update

Chilton reported that he is no longer on the ISAC committee. The sequestration has posed problems for ISAC. The Fall meeting was to be held in conjunction with the National Invasive Species Awareness Week. However, both were cancelled. The next meeting will possibly be held in June.

National Invasive Species Awareness Week Update

Due to the sequestration, the National Invasive Species Awareness Week was reduced to several receptions. Also, some lobbying was done on The Hill.

Public Comment

Hartman provided the opportunity for public comment. No comments were received.

The meeting recessed at 5:00 p.m.

Thursday, April 11, 2013

The meeting reconvened at 8:30 a.m. The Chairman again provided the opportunity for public comment. No comments were received.

Work Group Updates and Future Directions

Chilton provided the update for the Pathways and Prevention Group. The GSARP Strategic Plan states that the Pathways and Prevention Group is charged with identifying pathways through which non-native species are known or thought to be transported into the Gulf and South Atlantic Region and have the potential for effective interdiction, and to develop plans and recommendations for measures to help prevent the transport of non-native species into the Gulf and South Atlantic region by addressing their transport pathways. **Chilton** referenced page 7 of the Strategic Plan under *Objective 2*; *Task 1*; *Strategy B* whereby the Pathways/Prevention Work Group will conduct an inventory of existing state and federal species prevention plans using conference calls and email. It was decided that the most important pathways listed in the Pathways and Prevention document developed by **Pam Fuller** would be discussed with the states to see how they are addressing those issues, and recommendations on solutions will be made.

Bonvechio provided the update for the Eradication Group. Emails will be sent to each state requesting their priority lists of species, and to decide if management or eradication is the answer for each species. This will then be summarized by region.

Teem provided the update for the Research and Development Group. An update was done on the survey of aquatic invasive species issues in the Gulf. A Species of Concern list was compiled. The list is a combination of which invasive species are presently a concern in the states, and which invasive species have the potential to become a threat. The list will be put on the website. **Teem** asked the panel to decide if the list was acceptable, and to also work towards getting it finalized. It was decided that the list can be updated as needed. **Ballard** will put a date stamp on the list when it is updated. **McMahon made a Motion to put the Aquatic Invasive Species of Concern List up as it is so that it is a living document. Riecke seconded. The Motion passed unanimously. Teem** spoke on a funding method called Crowdsourcing. There is a website where scientists trying to obtain funding for projects can present their proposals. The public then looks at the proposals and can assist with funding the projects. **Teem** suggested that some projects that GSARP are involved in (TexRAT) could perhaps be put on the website. **Teem** will provide the links to the panel members.

Jacoby provided the update for the Education and Outreach Group. The Strategic Plan was looked at. Task level efforts will be revised. Focus will be placed on "Train the Trainer" sessions, and see how they can be moved forward. The Traveling Trunk will be translated into Spanish, and he will seek someone to translate it into Vietnamese as well. A template will be developed that lists costs of dealing with invasive species. **Schmitz** stated that in Florida, they surveyed all of the 67 counties. They received 54 responses, and determined that $19 million was spent dealing with invasive plant species on county-owned properties. **Schmitz** is also working on putting together a yearly cost survey for the North American Invasive Species Network. They are compiling a list with contact information for the states and provinces of North America, and who the surveys should be sent to. The first survey will be sent out electronically this summer and will consist of approximately 25 questions. He asked the panel members to please complete the survey when they receive it. He will keep the panel members informed of the progress.

Hartman provided the update for the Early Detection and Rapid Response Group. After reviewing the existing second edition, it was decided that a new document will be created by combining content from the GSARP plan, the Western Panels, and various EDRR plans.

Knott suggested putting each state's Tier 1 contact names and phone numbers on GSARP's website so that the public would be able to report invasive species concerns to the appropriate person.

Schmitz provided the update on the Information Management Group. He reminded the members to please fill out the surveys he spoke of earlier. Additional surveys will be done, and he asked the members to provide him with suggestions if they have any.

<u>Opening Remarks on the Use of eDNA in the Gulf & South Atlantic Region</u>

Herod gave a PowerPoint Presentation entitled "Environmental DNA (eDNA) and Coordination". **As an Action Item, GSARP members were asked to consider including eDNA in the EDRR Plan**.

As an Action Item, GSARP members were asked to consider having an eDNA session at a future GSARP meeting. The purpose of the session will be to provide the current understanding of the technology, as well as capacity, and need among GSARP members.

As an Action Item, GSARP members were asked to consider developing a Community of Practice (COP) for the eDNA effort. This COP would be a committee of GSARP. Knott made a motion to develop a Community of Practice (COP) for the eDNA effort. The motion was seconded, and the motion passed.

Herod reported that eDNA is a surveillance tool that can be coupled with traditional sampling. There are current projects using eDNA, such as Asian Carp.

There are six elements of the USFWS Region 4 eDNA strategy: The creation of a Community of Practice (COP) with the partners; the establishment of critical infrastructure; biosecurity; the implementation of standard operating procedures for eDNA studies; cross-validation of all procedures and results; to provide necessary training for the partners and potential volunteers.

eDNA: A Tool for Inventory and Monitoring of AIS

Greg Moyer gave a PowerPoint Presentation entitled "eDNA: A Tool for Inventory and Monitoring of Aquatic Invasive Species". Dr. Moyer spoke on eDNA, and defined it as the detection of target taxon's genetic material (cellular or extracellular) from its environment without seeing/capturing the taxon. Environmental DNA was first used for AIS monitoring in 2008. In 2010, it was used for the first time for AIS monitoring in U.S. rivers.

Applications for eDNA include early detection, surveillance, and to determine routes of invasion of AIS into natural systems. It can also be used to identify and monitor endangered species and declined populations, as well as to assess ecosystem health, biodiversity, environmental impact, trophic interactions, and changes in species distribution, climate, and niche stability. The strategy is to develop a suite of primer/probes for regional AIS needs, collect water samples, and test DNA of the sample for eDNA of target taxa. The cost depends on the methods used, and various factory discounts, overhead, etc.

The AIS goal is to establish early detection and rapid response with predictive modeling using GIS and the incorporation of urban growth and climate change forecasts; eDNA sampling (there are still some major hurdles); and the establishment of an eDNA COP.

Ongoing research for eDNA detection is being done on bullseye snakehead and African jewelfish in the Loxahatchee National Wildlife Refuge, and lionfish, mayan cichlid, and Asian swamp eel in Savannah.

Actions, Questions, and Discussions on eDNA for AIS

Herod explained that a simple way to coordinate the eDNA for AIS effort is to include it as a separate component in the EDRR plan. However, it would be better to establish the COP and develop a process and special session. Other considerations are what role GSARP should play, and if a business plan should be developed; the role of individual GSARP members in the strategy; what species should be chosen; costs.

Update on Lionfish Activities in the Gulf and South Atlantic Regions

Akins gave a PowerPoint Presentation entitled "Lionfish Update…Most Recent Status, Research, and Happenings".

Lionfish prefer structure, but are also found on shorelines and in very deep water.

Lionfish consume prey over half their size. They consume commercially and recreationally, and are growing larger here than in their native range.

Additional invasion factors are fewer parasites than in their native range; faster growth; less competition; prey naiveté; genetic vigor.

Local control can be effective for keeping lionfish populations under control. Training, focused effort, regular visitation, prioritizing sites, removal targets, and resource allocation are all important in control efforts.

The dive industry has taken the initiative and developed lionfish control methods.

Models were developed to predict the number of lionfish that reefs can support without causing degradation. Preliminary results have found that removal of lionfish from reefs allow native fish to recover.

Lionfish are being caught on hook and lines. They are also being found more in commercial lobster traps. Observations showed that lionfish were using the traps as shelter. When lionfish are present in the traps, the catch rates for lobster is lower.

Lionfish derbies started in 2009 and have spread throughout South Florida and the Bahamas. Derbies can provide outreach and awareness; training for removers; media interest; samples for research; tasting opportunities; lionfish removal. A study done last year found that the derbies reduced the local lionfish population by 69%.

Lionfish (1,043) that were collected at a local derby would have consumed 2-8 million prey in Palm Beach if they had not been removed.

The GCFI Annual Lionfish Session will be held in Corpus Christi in November 2013.

An effort is underway to develop a Regional Lionfish Survey. It is in final review and will hopefully be finalized by the end of the year.

There is a demand for lionfish meat. **Akins** stated that restaurants have contacted him to inquire where they can get lionfish. Cookbooks have been published with recipes.

Ciguatera is a roadblock for promoting mass demand for lionfish meat. It has been found in some lionfish in the USVI. Testing has been done through the FDA and NOAA, but there have

been no known cases of CFP. A regional workshop will be held involving the FDA, NOAA, REEF, and 16 countries. Mercury testing is also being done on lionfish.

An iPhone app is being developed that will help divers search for lionfish.

State Reports/ Members Forum

Alabama

Newton reported that several invasive species have been documented in Alabama coastal waters. The Bocourt swimming crab, tessellated blenny, Australian spotted jellyfish, and Asian green mussel have been documented, although non-validated or undocumented reports of additional invasive species likely exist. Prey of Australian spotted jellyfish include early life history stages of commercially and recreationally important finfish. The Bocourt swimming crab could compete for resources of the native blue crab. The current status of these two species does not indicate that they do not pose an imminent concern.

The giant tiger shrimp (*Penaeus monodon*) has been a species of concern since 2006. Captures of this species have continued to increase. The 43 confirmed reports during 2011 indicate that the giant tiger shrimp now occurs within all of Alabama's primary estuary basins. The concern for *P. monodon* has decreased within the commercial shrimping community, which has resulted in fewer validated reports. AMRD acquired 16 tiger shrimp from January 1, 2012 through April 2, 2013. It appears that the tiger shrimp has become established in Alabama's waters. AMRD continues to document occurrence, characterize the population structure, and process samples for genetic investigation.

The first confirmed report of a lionfish was documented in June 2011 by a spear fisherman who collected one from an oil/gas platform approximately 43 miles south of Dauphin Island. Numerous unconfirmed reports of lionfish have been made that indicate lionfish are abundant on Trysler Grounds, an area of natural hard-bottom about 16 miles south-southeast of Orange Beach. Scuba divers reported observing up to 30 lionfish during single dives in this area during the 2011 dive season. Recent reports in 2012 indicate that lionfish are even more abundant than previous years. Over 60 lionfish were observed by a recreational diver during a dive at Trysler Grounds during the 2012 diving season. Unconfirmed reports are being made by scuba divers that indicate lionfish are widespread throughout Alabama's artificial reef permit zone. A local dive shop donated 26 lionfish to AMRD after a month-long lionfish rodeo in June and July 2012. Since 2009, AMRD has been storing lionfish specimens donated by dive shops, tournament coordinators, and recreational scuba divers. Alabama Marine Resources Division has joined the Mississippi Bight Lionfish Response Unit (MBLRU).

Florida

Schmitz reported that the Florida Fish and Wildlife Conservation Commission's Invasive Plant Management Section and the University of Florida Institute of Food and Agricultural Sciences Center for Aquatic and Invasive Plants held a Research and Outreach Review Meeting on March 12-13, 2013. The purpose of the meeting was to exchange current scientific research and outreach information on invasive plant management in Florida. Approximately 100 people

attended the meeting, and included federal, state, and local government resource managers, university and government scientists, and outreach professionals.

FWC is presently funding numerous invasive aquatic plant management research projects in Florida.

Schmitz provided an information sheet on the North American Invasive Species Network (NAISN) that listed ten essential core invasive species resource services that are critical to preventing new invaders, and managing invasive species that have become established in North America.

Georgia

Bonvechio spoke on the Satilla River Flathead Catfish Removal Project. In 2006, the Georgia legislature appropriated funding for three positions to the Wildlife Resources Division Fisheries Management Section. These personnel were assigned to reduce the flathead population levels through direct removal. One position was eliminated in FY2009. The crew removed 2,861 flatheads. Since the implementation of the full-time flathead management program in 2007, over 26,000 fish have been removed from the river. The size structure of the population has also declined. In addition, the age structure has also been truncated by removal efforts.

Water levels appear to affect recruitment. During the drought years, catch rates were down in 2007, 2008, 2001, and 2012. During the high water years of 2009 and 2010, catch rates were considerately higher.

There appears to be a compensatory shift in sexual maturity due to over a decade of increased exploitation. Intensive harvest must be maintained to prevent flathead populations from rebuilding within 2 to 5 years.

During sampling in 2011, the WRD removal crew documented the non-indigenous range expansion of the Blue Catfish occurring in the Satilla River. Seven blue catfish were recovered this season. No blue catfish were recovered during sampling in 2012.

The Program Manager at the Chattahoochee River National Recreation Area has recently received a grant to develop a control strategy for the Asian rice eel, which has several characteristics that make it difficult to manage.

There is another possible population of apple snails in Withlacoochee River drainage.

There have been multiple sightings of lionfish off of Georgia's coast in St. Mary.

Louisiana

Bourgeois reported that since October, there have been no reports of tiger shrimp from the public. LDWF biologists continue to search for them in their Fishery Independent sampling. They are reviewing videos and other data collected on their rig surveys. Exotics will be recorded as part of their data review.

LDWF staff continues to monitor the spread of lionfish in the Gulf of Mexico. There have been reports by the public, divers, and spear fishermen. The LDWF research dive program has been monitoring fish assemblages at oil rigs, and a lionfish-specific study is being developed that will be implemented in summer 2013. A ROV survey was done on 24 LDWF artificial reef sites. Lionfish were recorded at 5 of the 24 sites. Possible surveys will be done on all of the 64 sites.

LDWF received reports of a single tilapia in one of the pools of the Red River in North Louisiana. It was confirmed as a tilapia, but not definitively identified to species.

A report of an apple snail shell in the Calcasieu area on the Inter-coastal Waterway was received. Follow-up trips by fishery biologists have not shown the presence of egg masses or snails. A staff member will continue to survey the areas on personal fishing trips.

Drift net sampling for Asian carp will soon begin, which is part of a 2012 ANS grant.

Mississippi

Pursley reported on early detection and rapid response activities. Common salvinia weevils were obtained from the LSU Ag. Center and released with permission from MDWFP at Stennis Space Center in an effort to further manage an infestation of common salvinia in their barge canal system. The barge canal system connects directly with the Pearl River and has an intermittent connection with Bayou La Croix. Water hyacinth in a Biloxi drainage ditch was reported by a citizen. The report was investigated and found to be accurate. Management efforts are under way.

Pursley next reported on coordination and outreach activities. There have been no reports of Asian tiger shrimp. Tissue samples from seven previously caught shrimp were sent to NOAA-NMFS Tiger Shrimp Tissue Repository as part of a nationwide effort to better understand the species.

Final edits and updates for the Mississippi State Management Plan for Aquatic Invasive Species were received. After a 30-day public comment period, the plan was approved by the Governor's office and sent to the ANS Task Force for pending approval at their next meeting.

DMR participated in the MS Cooperative Weed Management Area (CWMA) meeting, SARP ANS conference calls and working groups, the MS Bight Lionfish Response Unit (MBLRU), a regional cogon grass summit meeting, and an AIS Incident Command System training workshop.

At a public artificial reef science seminar, a presentation was given entitled "*Invasive Species – A Threat to Mississippi's Artificial Reef Habitats*".

A multi-state, multi-agency aquatic AIS project pre-proposal was submitted to MASGC to try to secure funding in order to better document aquatic invasions and their effects.

The MS-CWMA was provided with approximately 1,000 "Stop Aquatic Hitchhikers" brochures for distribution at the Gulf Coast Garden and Patio Show and other public venues.

Riecke reported on new activities since October 2012. As AFS Resolutions Chairman, he worked to guide consideration and voting on a *Resolution on the Federal Funding for Programs to Prevent, Control, and Manage Aquatic Invasive Species*. In January 2012, the SDAFS membership approved the resolution and voted to send it to the Parent Society for consideration. In July 2012, the AFS Resolutions Committee sent a revised version of the SDAFS resolution to the AFS membership for a vote in August 2012. On March 6, 2013, the resolution was adopted by the AFS members. It will be published in a future issue of *Fisheries*.

A SDAFS *Resolution on Federal Funding for Implementation of the Management and Control Plan for Bighead, Black, Grass, and Silver Carps in the United States* was adopted. This resolution is currently being considered by the AFS Parent Society Resolutions Committee.

MDWFP formed an aquatic plant treatment team to deal with invasive aquatic plants that are impacting boating access sites.

In October 2012, giant salvinia was found at a boat ramp site on the Ross Barnett Reservoir. Most of it was manually removed, and the remainder was chemically treated. The DMR is monitoring and treating giant salvinia and other invasive plants in Mississipi's coastal river systems.

In January 2013, silver carp were reported in Pickwick Lake in northeast MS.

The *Mississippi State Management Plan for Aquatic Invasive Species* was sent out again for public comments. Governor Phil Bryant approved the plan and it was sent to the National ANS Task Force in April 2013. It is hoped that the plan will be approved at their Fall 2013 meeting.

"Stop Aquatic Hitchhikers" signs are being posted at new boat ramp sites. "Stop Aquatic Hitchhikers" cards are being reprinted and distributed along with all boat registrations or renewals that are mailed out.

The MS Museum of Natural Science has a permanent exhibit on exotic species.

Riecke reported on future activities. Freshwater fishing bait regulations will be composed to specify what bait can be legally sold, possessed, transported, and used in MS.

A list of approved, restricted, and prohibited species as specified in the *Mississippi State Management Plan for Aquatic Invasive Species* will be adopted.

An EDRR monitoring program comprised of state and federal personnel who sample aquatic species in MS public waterways on a routine basis will be established.

North Carolina

Emens reported that hydrilla was found in Lake Waccamaw. It is believed that introduction took place at a boat ramp. It is the first time that they have had to deal with hydrilla in a natural lake. It will cost approximately $450,000 annually to treat the areas with Sonar, a herbicide.

The Wildlife Resource Commission is discussing the possible development of an invasive species program.

South Carolina

Knott reported that projects are under way to screen for invasive species. Recently, juvenile tiger shrimp diets are being studied.

Tiger shrimp are being monitored and a tissue repository is being kept. An effort to create a manuscript is under way. Early indications have found that there is very little genetic variation. Reports of sightings have declined, and smaller shrimp are being captured.

A new virus (EMS – Early Mortality Syndrome) is killing tiger shrimp at shrimp farms in Asia.

There is an interest from the regulatory branch to develop a list of invasive marine species. It is in draft form.

Texas

McMahon reported that they are working on the zebra mussel problem, which has gotten worse. In spring 2012, they found zebra mussels in new locations. There is a huge concern that many reservoirs that supply water to millions of people will become infested with zebra mussels and cause disruption to water service due to the mussels clogging the intakes.

Chilton reported that they will be hiring two invasive species biologists. One biologist will be located in east Texas and will focus on aquatic plant species and biological control. The other biologist will be located in Austin and will focus on zebra mussels, and riparian and stream habitats.

Chilton stated that they have requested $18-$19 million in funding.

TPWD is considering listing golden bamboo as a prohibited species.

Hartman reported that they are not getting a lot of *Penaeus monodon* reports.

HARC

Gonzalez reported that development of invasion potential score cards for aquarium species is continuing.

A stakeholder meeting will be held later this year.

MBLRU (MS Bight Lionfish Response Unit)

Ballard reported on the MBLRU (MS Bight Lionfish Response Unit). MBLRU is a new cooperative project between the GSMFC, Mississippi DMR, Alabama DNR, the National Park Service and the U.S. Fish and Wildlife Service. A lionfish monitoring program will be developed at 30 established sites in the near coastal waters between Pensacola, FL and the Mississippi River Delta to monitor and track the invasion of the Indo-Pacific lionfish. Diver surveys will be conducted, and lionfish encountered during monitoring operations will be

removed. All equipment has been purchased and delivered to the agencies that will be carrying out the monitoring dives. This project will provide a better understanding in regards to the invasive lionfish population in northern Gulf waters, and will provide much-needed information on the associated species composition and densities at these 30 sites. This information will be useful for assessing the impacts the invasive lionfish have on native species, and for informing future management decisions.

Discussion of ANSTF Recommendations

After discussion by the members, it was decided that recommendations would be discussed at the next GSARP meeting in October.

Other Business

Bourgeois mentioned that a new Southeast Asian aquarium freshwater colored shrimp is being marketed, and could possibly become a future problem as an invasive species if released. The shrimp are being sold in a "shrimparium", which is an aquarium stocked with aquarium plants and shrimp.

Riecke recommended that a list of GSARP's accomplishments be published on its website.

Next Meeting Time and Place

It was decided that Raleigh, North Carolina would be the location of the next meeting.
The next meeting will take place during the first week in October.

Public Comment

Hartman provided the opportunity for public comment. There was none.

A motion was made to adjourn the meeting, and the motion was approved. There being no further business, the meeting adjourned at 3:30 p.m.