GULF & SOUTH ATLANTIC REGIONAL PANEL
ON AQUATIC INVASIVE SPECIES
MINUTES
Tuesday, April 5, 2016 & Wednesday, April 6, 2016
Orange Beach, AL

On Tuesday, April 5, 2016 Chairman **Kristen Sommers** 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
Lad Akins, REEF, Key Largo, FL
James Ballard, GSMFC, Ocean Springs, MS
Tim Bonvechio, GA DNR, Waycross, GA (via conference call)
David Britton, US FWS, Arlington, TX
Rick Burris, MS DMR, Biloxi, MS
Paul Carangelo, Port Authority, Corpus Christi, TX
Rob Emens, NC DEQ, Raleigh, NC
Lisa Gonzalez, HARC, The Woodlands, TX
Chuck Jacoby, Indian River Lagoon National Estuary Program, Palatka, FL
Peter Kingsley-Smith, SC DNR, Charleston, SC
Herb Kumpf, At-Large Member, Stuart, FL (via conference call)
Jon Lane, USACE, Jacksonville, FL
Adriana Leiva, TPWD, Corpus Christi, TX
Robert McMahon, UT Arlington, Arlington, TX
Roberto Mendoza, Univ. Of Nuevo Leon, Mexico
Craig Newton, AL DCNR, Dauphin Island, AL
Matt Neilson, USGS, Gainesville, FL
Matt Phillips, FWC, Tallahassee, FL
Bobby Reed, LDWF, Lake Charles, LA (via conference call)
Dennis Riecke, MS DWFP, Jackson, MS
Kristen Sommers, FL FWC, Tallahassee, FL
Lindsey Staszak, NC DENR-DMF, Elizabeth City, NC
Timothy Strakosh, USFWS, Atlanta, GA
John Teem, FL DOA, Tallahassee, FL
Anna Toline, NPS, Fort Collins, CO

Staff
Ali Ryan, GSMFC, Ocean Springs, MS
Joe Ferrer, GSMFC, Ocean Springs, MS

Others
Mark Albins, USA, Dauphin Island, AL
Nathan Aycock, MDWFP, Rosedale, MS
Jacoby Carter, USGS, Lafayette, LA (via conference call)
Dan Thayer, USGS, Gainesville, FL

William Wayman, USFWS, Warm Springs, GA

Public Comment

Chairman **Sommers** provided the opportunity for public comment. No public comments were received.

Adoption of Agenda

After two minor changes, a motion to adopt the agenda was made, and passed unanimously.

Approval of Minutes

The minutes of the October 6-7, 2015 meeting in Myrtle Beach, S.C. were presented for approval.

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

Invasive Pacific Lionfish: A Threat to Northeastern Gulf of Mexico Reef Fish Communities?

Mark Albins gave a PowerPoint Presentation entitled "Invasive Pacific Red Lionfish: A Threat to Northern Gulf of Mexico Reef Fish Communities?" The reasons for concern for lionfish include: their high growth rates, rapid spread, deadly predatory freshwater fish invasions, potential large invasion range, and few natural controls of them. They are reproductively mature at less than one year of age, and females can produce two million eggs a year. There is a 67% population growth rate per year.

Local mitigation can be done through focused removals. The Biscayne National Park Lionfish Removal Program was initiated in 2010, and includes all patch reefs, artificial reefs, continuous reefs, and channels in the Biscayne National Park. There have been over 1,400 removal dives. Over 4,000 lionfish have been removed, but the BNPLRP has not kept up with the lionfish invasion in some habitats.

To effectively reduce local lionfish populations and mitigate their effects in a two-year period, bi-monthly monitoring of lionfish and native fishes would need to be done in the first year. In year two, removal treatments would be done, and the change to the populations monitored.

Effective removal strategies include involvement by the public through tournaments and derbies, and commercial fishing by creating stakeholders with a vested interest. Focused, ongoing, intensive removals by managers is needed.

Regional Lionfish Abundance, Habitat Use, and Impact Utilizing an Existing Fisheries Monitoring Survey

Kingsley-Smith gave a PowerPoint Presentation entitled "Regional Lionfish Abundance, Habitat Use, and Impact Utilizing an Existing Fisheries Monitoring Survey". The Southeast Reef Fish Survey (SERFS) is a long-term regional fisheries-independent monitoring program. The main goal is to monitor long-term changes in relative abundance, age composition, and length frequencies of reef fish found on hard bottom habitats.

Sampling locations are located from Cape Hatteras, NC to St. Lucie Inlet, FL, with known live bottom, ranging from 9m to 109m in depth. Video cameras were mounted on chevron traps, and 20 minutes of video was read. Forty-one frames per video were read. Habitat was characterized, and the total lionfish seen in the forty-one frames was determined, along with the most lionfish seen in any frame.

The objectives of the lionfish data is to develop an index of abundance using video data, and to determine their effects on native fish assemblages. A zero-inflated negative binomial model was used to determine the relative abundance of lionfish. The best model was chosen using Bayesian Information Criterion (BIC) values, and this model was used to determine a relative abundance index. The video data for federally managed species showed the presence of mostly large species, such as snapper, grouper, and jacks. There was no significant differences between the presence/absence of lionfish in the video alone. The chevron trap data showed smaller, forage species. Few lionfish were caught.

This was the first large-scale study of lionfish abundance and distribution in this region. There is an increase in the number of sites with lionfish. Based on hybrid video/trap data, lionfish presence correlates with species assemblage differences on a region-wide level. Potentially susceptible species have been identified to guide future monitoring efforts to look for lionfish abundance-related impacts.

Update on the Alabama Adopt-a-Reef Program

Newton gave a PowerPoint Presentation entitled "Alabama Adopt-a-Reef Program". The Mississippi Bight Lionfish Response Unit (MBLRU) was created in a partnership agreement with MS Department of Marine Resources, US Fish & Wildlife, Gulf Islands National Seashore, and AL Marine Resources Division. Funding was provided by the Gulf States Marine Fisheries Commission through two sub-awards.

Adopt-a-Reef Program information is on the AL Department of Conservation & Natural Resources Marine Resources Division "Outdoor Alabama" website. Participants are needed to identify, quantify, and remove items which could affect reef productivity. A Voluntary Reef Survey Form is available for people to fill out and submit to AMRD. Requested information includes: reef location, reef type, reef material, structural integrity, degree of debris fouling, and debris material description and if it was removed. Also, if lionfish were observed, number of lionfish, and percentage of site covered with lionfish. A report map is available on the site that shows reef information, locations, and number of lionfish reported.

Adopt-a-Reef T-shirts, visors, stickers, and brochures are available. Booths are set up at numerous outreach events.

Maculata Apple Snail Research along the Northern Gulf of Mexico Coast

Jacoby Carter provided a PowerPoint Presentation entitled "USGS Maculata Apple Snail Research along the Northern Gulf of Mexico Coast". Maculata apple snails demonstrate risk for rice agriculture and aquatic macrophytes in forested wetland systems. They are easy to detect, but hard to estimate their densities and even harder to control. Experimental lab data indicates that apple snails can better tolerate low temperatures than previously thought.

Biological control and chemical control experiments using tea tree extract and niclosamide were performed at USGS. Flooding was used to test its effect on egg masses. At the Jean Lafitte National Park Barataria Preserve, Van Dyke's Snail Traps were used, but discontinued due to by-catch issues, low capture rates, handling time, and cost. Snail telemetry was attempted, but only one transmitter has been deployed. The snail's location was checked every two weeks for six weeks, until the snail was found depredated. The distance between relocations varied between seven and 20 meters.

Currently, the only approved treatment is copper sulfate, but this will have only limited application. Other options are being explored. Recent discussions with the EPA indicate that the molluscide Metaldehyde has recently been approved for use in Hawaiian taro fields.

Currently, research is being done on population size, predation, movement, and impact at the Jean Lafitte National Park Barataria Preserve and study sites near Houma, LA. Experimental attempts to control egg mass survivorship is also being done.

Distribution, Demographics, and Impacts of the Island Applesnail (*Pomacea maculata*) in South Carolina: Past, Present, and Future Research Efforts

Kingsley-Smith gave a PowerPoint Presentation entitled "Distribution, Demographics, and Impacts of the Island Applesnail (*Pomacea maculata*) in South Carolina: Past, Present, and Future Research Efforts". The island applesnail is native to parts of South America, and was first reported in the U.S. in Florida in 2002. It is now found throughout much of the Gulf and South Atlantic region. It was first reported near Myrtle Beach, S.C. in 2008. There are currently three populations of applesnails in S.C.

Applesnails are agricultural pests. They consume a wide variety of aquatic vegetation, and compete with native snail species. They have higher rates of feeding and growth than most native freshwater snails. Females deposit at least one egg mass per week from April – September, and each egg mass contains over 200 eggs, each yielding 10-140 snails. Potential mechanisms for spread include storm-water pond connectivity, predators, new human introductions, and flooding.

There is a human health concern with applesnails. They can serve as an intermediate host for the rat lung worm parasite. Humans become infected through food containing third-stage (infective) larvae. This causes eosinophilic meningitis or eosinophilic enteritis.

To determine distribution, 100 ponds were randomly selected throughout coastal S.C. and surveyed for additional populations of applesnails outside of the three known areas, the seasonality of snail capture, and reproductive activity. The pond perimeters were surveyed for snails and egg masses, which were then counted. All snails were collected, and all accessible egg masses were destroyed. Water quality data (temperature and conductivity) was also collected. No new applesnail populations were found in the ponds. However, four other invasive freshwater snail species were found on Hilton Head Island.

In March 2016, an applesnail was collected from the Waccamaw River by SC Department of Natural Resources Diadromous Research Section.

New research is being done to determine the presence of *Angiostrongylus cantonensis* in applesnails collected in SC. Initial efforts focused on microscopy, but qPCR techniques are now being used to detect the parasite. Determination of snail sex ratios is also being researched. Reproductive maturity, size-at-age, and mark-recapture studies are also being discussed. Improvement in abilities to capture snails in ponds is needed.

Zebrafish: A Model System for Developing a Gene Drive to Eradicate Invasive Fish

Teem gave a PowerPoint Presentation entitled "Zebrafish as a Model System for Developing a Gene Drive to Eradicate Invasive Fish". There are benefits to gene drive development. It is species-specific; self-perpetuating; is feasible for most organisms that reproduce sexually; can be used to produce a "daughterless" eradication strategy; eradication is possible in large systems. There are also risks involved. Once started, it cannot be stopped; it cannot be limited geographically; it could endanger invasive species in their native range.

It must be determined if a gene drive can be set up in a fish to study the dynamics of the system; if the gene drive can be constructed as an inducible system to limit the environmental risk; and if a prototype for an inducible gene drive can be produced based upon the daughterless carp eradication strategy.

The gene drive fish is produced at twice the rate of normal males and females. Eventually the gene drive fish fills the carrying capacity and females go to zero. A single gene drive fish can cause the target population to go to extinction. Can the parameters be changed in some way to prevent extinction? Reducing the viability of the gene drive fish increases the time required for extinction, but does not prevent extinction. Reducing the viability of the gene drive fish prevents extinction, unless a sufficiently large number of gene drive fish are added. Would it be possible to stop the gene drive after a fixed number of generations? Future experiments would consist of shortening telomeres (chromosome ends) to see if it would stop the gene drive after a fixed number of generations. Telomeres have a unique structure composed of repeating DNA units. The telomeres length is reduced by one unit at each cell division. As repeats are eliminated, viability is progressively reduced.

Long-term efforts include making telomerase conditionally expressed in zebrafish; determining the number of generations that fish can attain in the absence of telomerase; determining whether telomerase expression can be manipulated to control telomere length in a gene drive fish, allowing regulation of a gene drive.

The USFWS' Grass Carp Certification Program

Bill Wayman gave a PowerPoint Presentation entitled "National Triploid Grass Carp Inspection and Certification Program (NTGCICP) Overview". The USFWS offers a triploid grass carp inspection service for natural resource agencies in the U.S. and other countries to help them protect their aquatic habitats. The inspection program is to provide assurance to these agencies, and others concerned about protecting aquatic resources, that shipments of grass carp alleged to be all triploid do not, within the confidence limits of the inspection program, contain diploids.

A workshop was held in 2008 with USFWS inspectors and TGC producers and states. The objectives discussed were state regulations and issues; review of NTGCICP; Memorandum of Agreement (MOA) with TGC producers. Triploid grass carp producers want assurance that the NTGCICP would provide assistance to law enforcement and prosecute violators; set standards for states and shippers; eliminate dishonest producers.

USFWS will inspect and certify triploid grass carp, but only if the producer follows prescribed QA/QC. The program has standards for triploid inspectors, grass carp producers, collection of fees, penalties/fees for program non-conformance, and a checklist for inspectors and triploid grass carp producers.

The top five states for NTGCICP certified triploid grass carp distributions (in order) are Florida, Texas, Arizona, Ohio, and North Carolina.

An untested group of grass carp (90+% triploid) is harvested from a Production pond and transferred into a holding house. The triploid grass carp producer must individually test every grass carp, and remove all diploids prior to any USFWS inspection of that population. Untested grass carp are tranquilized and sized prior to initial blood testing at farm site. Each fish has a blood sample drawn. Each blood sample is placed into a separate accuvette of diluent in a coded accuvette tray. Particle sizing equipment is used to read reference standards. Coulter Counter displays graph of channelized grass carp blood standards. If a diploid fish is identified, the accuvette position on the tray is marked, and the identified diploid fish is removed. Tanks of producer-tested alleged 100% triploid grass carp must be maintained in strict compliance with national standards. A USFWS inspector checks fish and supervises the selection of 120 alleged 100% triploid grass carp to be inspected. The channelization of blood samples to verify the ploidy readings is then supervised, and if all fish pass inspection, the inspector issues certificates for shipments of "USFWS-Certified" triploid grass carp. Each certificate is numbered, and their signature is embossed on the original certificate that is also signed and dated by the producer. A copy is made for the producer and inspector. After all fish are loaded for shipment, the customer/hauler receives an invoice and the original embossed USFWS certificate for legal transport. The inspector formally contacts the receiving state's triploid grass carp coordinator. The certificate expires six calendar days from the date of inspection, and fish must enter the receiving state prior to expiration.

USFWS is in the process of developing a set of federal rules to oversee the NTGCICP. This will give the USFWS better legal standing when dealing with violators.

Update on the Efforts to Switch all States Over to Triploid Grass Carp

Riecke gave a PowerPoint Presentation entitled "Update on the Efforts to Switch all States Over to Triploid Grass Carp". The Asian Carp Working Group created the *Management and Control Plan for Bighead, Black, Grass, and Silver Carps in the United States*. There are 131 recommendations. Recommendation 3.1.6.1 states that the USFWS should seek an independent scientific review and evaluation of the Triploid Grass Carp Inspection and Certification Program.

The Mississippi Interstate Cooperative Resource Association (MICRA) is working on some priority recommendations in the management plan, such as expanding the scope of the independent scientific review of the grass carp inspection program to cover legal use of diploid grass carp, producers, shippers, distributors, and federal and state law enforcement efforts to touch all aspects of the grass carp stocking industry. The USFWS hired MICRA as a contractor to produce a report. MICRA hired a private contractor to do the field work and produce a report. MICRA revised and submitted the report, with eight recommendations, to USFWS in February 2015.

MICRA hosted a meeting of diploid states in July 2015 in Colorado to present the grass carp program report, summarize current regulations, discuss identifying difficulties to have 100% triploid use, and to discuss strategies to address those difficulties. All of the diploid states are taking steps to eliminate the use of diploid grass carp for state activities.

Impacts of Asian Carp on Sport Fish Populations in Delta Lakes

Nathan Aycock gave a PowerPoint presentation entitled "Effects of Silver Carp Introductions on White Crappie and Largemouth Bass in Floodplain Lakes of the Yazoo River Basin, MS".

Crappie CPUE, growth rate, and weight decreased after a flood in 2011 in lakes where silver carp were introduced. Crappie CPUE increased in lakes where silver carp were not introduced. Weight increased or stayed the same.

Largemouth bass CPUE and weight decreased after a flood in 2011 in lakes where silver carp were introduced. Largemouth bass weight increased after flood in lakes where silver carp were not introduced. The CPUE was similar.

Silver carp introduction has negatively affected largemouth bass and crappie populations. Silver carp are highly efficient planktivores, and compete directly with juvenile bass and crappie for zooplankton. There is a high dietary overlap between silver carp and both gizzard shad and bluegill sunfish.

Future work includes finding better ways to estimate silver carp abundance, recording shad abundance, and to continue sampling lakes and monitoring trends. MDWFP is monitoring carp populations, researching the effects of carp, educating the public, working to stop further expansion, encouraging harvest, and working to establish markers.

Asian Carp Distribution in the Tenn-Tom Waterway

Riecke gave a PowerPoint Presentation entitled "Asian Carp Distribution on the Tennessee-Tombigbee Waterway, Mississippi". The first known silver carp was seen in Pickwick Lake in

2012 in Bear Creek. MDWFP was notified by commercial anglers in July of their catch. Catch rates have steadily increased, and distribution has widened to include most of the lake. Silver carp have been seen as a seasonal fishery from April through October in MS waters. Currently, laws in Alabama do not allow for commercial angling with the use of nets in their waters. Presumably, silver carp over-winter in Alabama.

In 2015, eDNA sampling was conducted in Bay Springs Lake and Lock E on the TTW and Bear Creek in Mississippi by USFWS and MDWFP personnel.

A telemetry project was initiated in 2015. The objectives are to determine if there is any evidence of the inter-basin transfer from the Tennessee River drainage into the Tombigbee River drainage via the Tenn-Tom waterway; determine the seasonal movements of silver carp in MS waters of Pickwick Lake; determine population size and structure. Sampling is being conducted with experimental gill nets, with 2-5 hour soak times. Electrofishing is periodically being conducted to determine presence of Young of Year (YOY) silver carp. Commercial anglers are also providing assistance when available. Each silver carp will be measured, weighed, implanted, jaw tagged, and released. Tracking will be done with the use of receivers and transmitters, and data will be analyzed. Currently, two other silver carp telemetry studies are being planned for Pickwick Lake, and will begin in 2016.

In the future, various barriers on the Tenn-Tom will be potentially used as pilot studies. Effects of silver carp on sportfish populations will be monitored. Other funding sources to increase telemetry will be determined, and there will be further collaborations with neighboring agencies and other government entities.

Update on the USGS Invasive Plant Program

Dan Thayer gave a PowerPoint Presentation entitled "USGS Update on Invasive Aquatic Plant Program". *Myriophyllum spicatum* (Eurasian watermilfoil) is native to Europe, Asia, and northern Africa. Long-distance dispersal has been linked to the aquarium and aquatic nursery trade. Transport on boating equipment plays the largest role in introducing fragments to new waterbodies. It can be found throughout the U.S. in lakes, ponds, shallow reservoirs, lakes, streams, canals, and drainages. It competes aggressively to displace and reduce the diversity of native aquatic plants.

Hydrilla verticillata is native to the Indian subcontinent. It was imported to the U.S. in the 1950s for use in aquariums. It is mainly introduced to new waters on recreational boats and boat trailers. It is found in freshwater lakes, ponds, rivers, impoundments, and canals. It grows aggressively and competitively, and forms thick mats in surface waters that block sunlight penetration to native plants below. Dense beds affect water flow and water use.

Eichhornia crassipes (floating waterhyacinth) is native to South America. It is sold as an ornamental plant for fish ponds, and is accidently or intentionally introduced to water bodies. It can develop into dense floating mats of substantial biomass. The free-floating nature of the plant only exacerbates its problematic standing because the populations can move with water flow and wind. Recreational use of waters infested with this plant are greatly reduced. It can also impede drainage, creating backwater flooding conditions. Water quality and wildlife habitat can be

greatly affected, reducing dissolved oxygen levels under mats and covering the water surface with an impenetrable barrier. These dense surface mats shade out desirable submersed aquatic plants and create a safe breeding environment for mosquitoes.

Salvinia molesta (giant salvinia) is native to southeast Brazil. The species is used as an aquarium and water garden plant. It has been recorded in the U.S. since 1995, where it was discovered in a small pond in Colleton County, South Carolina. Once established in a new region, the plant is likely spread as a hitchhiker on boats, trailers and other recreational gear. Spread will continue through natural drainage and flow in river and stream systems. In lakes and large water bodies, leaves are effectively dispersed by wind and currents to infest new coves.

Trapa natans (water chestnut) is native to Europe, Asia, and Africa. It was introduced by aquarium release, hitchhiking on waterfowl, or intentional plantings. It spreads either by the rosettes detaching from their stems and floating to another area, or by the nuts being swept by currents or waves to other parts of a lake or river. It is a fierce competitor in shallow waters. It creates nearly impenetrable mats across wide areas of water. As immature water chestnut plants mature to the diameter of dinner plates over the growing season, dense packing and stacking of rosettes can occur, causing mats to be as much as a foot thick on top of the water column.

Alternanthera philoxeroides (alligatorweed) is native to South America. It is believed to have been contaminants in ship ballast water. After its introduction into the U.S., it quickly spread throughout the Southeast creating problems similar to those described for *Eichhornia crassipes*. In 1964, the USDA began releasing imported insects from South America as a biocontrol. The insects have been successful in managing this pest plant. The Aquatic Plant Control Program staff with the USACE Jacksonville District, upon request, annually coordinates the shipment of flea beetles collected in the St. Johns River in Florida to areas of the country where the flea beetles do not overwinter and alligatorweed persists.

Rotala rotundifolia (roundleaf toothcup) originates from southeast Asia, southern India, and Japan. It is used in the water garden trade. It was first reported as introduced to North America in 1996 in Coral Springs, Florida. It has since been found in southern Florida, northern Alabama, and southern Mississippi. It can produce extremely dense submersed communities and large thick floating mats, creating conditions that shade other submersed aquatic plants and restrict navigation and water flow in drainage and irrigation canals. Plants that break loose can build up at downstream structures, including bridge pilings.

Nymphoides cristata (crested floating-heart) is native to Asia, India, Sri Lanka, Taiwan and China. It is commonly used as an ornamental species for ponds and aquariums. It has been released into lakes, canals and other waters, and forms mats of overlapping floating leaves that shade the water column while impeding water flow and aeration. It may displace native plants and alter communities.

Aquatic plants have been reinstated to the Nonindigenous Aquatic Species Information System (NAS). This change was funded through reprogramming of current funds in combination with new funds received in FY2015.

Developing a qPCR Tool to Detect the Invasive Nematode Parasite (*Anguillicoloides crassus*) Kingsley-Smith gave a PowerPoint Presentation entitled "Developing a qPCR Tool to Detect the Invasive Nematode Parasite (Anguillicoloides crassus)". This invasive nematode parasite, endemic to East Asia, infects swimbladder lumen of anguillis eels. It has been spread rapidly beyond its endemic range - infecting eel species in Europe, N. America, S. Africa, and N. America through the commercial movement of live eels. The first report of *A. Crassus* in wild populations of the American eel *A. rostrata* came from Winyah Bay, SC in 1995. The damage to the eel's swimbladder is irreversible. It affects buoyancy control, and compromises swimming efficiency. This leads to mortality under stressful conditions.

Research attention turned to investigating the potential for detecting the parasite using genetic/molecular tools as an EDRR approach. A 2014-2015 USFWS Southeast Regional ANS small grants-funded project involved testing a qPCR method to detect and quantify *A. crassus* in the environment. Testing revealed that the tool was not unequivocally species-specific for *A. crassus*; non-quantitative; and based on a PCR product that is too large for qPCR. A new approach involved developing a species-specific qPCR protocol to detect and quantify *A. crassus*. A 2015-2016 USFWS southeast regional ANS small grants-funded project tested for environmental inhibition by spiking field samples with known amounts of *A. crassus* DNA and comparing the qPCR responses to positive laboratory controls. A specific probe was used to the qPCR protocol to increase its sensitivity and specificity. Limits of detection were established for the qPCR assay with the infective L3 larval stage using copepods cultured in the laboratory.

Field samples were tested for reaction inhibition. No inhibition was seen with any of the field samples. When field samples were spiked with *A. crassus* DNA, positive results were seen with similar cycle threshold values to the positive control samples. When L2 and L3 standard curves were compared, it was difficult to differentiate which life-stage is present in a sample, and inter-individual variation in DNA content appears high. Results from 2015 field samples revealed positive hits from plankton samples. No positive hits were observed in other sample types.

This newly-developed qPCR protocol is species-specific, quantitative, and ready to be used for testing field samples to detect the presence of *A. crassus*. In the future, the qPCR tool will be applied in the field. Temporal sampling will be done at a site of known infection to see if *A. crassus* is present year-round. Spatio-tempural sampling will be done across other habitats in SC to find out the distribution of *A. crassus* in SC, how localized infectious habitats are, and how the prevalence varies by location.

Samples from 2015 were re-run to verify the specificity of the primer-probe pair. No amplification was observed from closely-related philometrids, uninfected *A. rosata* swim bladders, or *A. rosata* fin clips. The probe makes the reaction more specific to *A. crassus*, enabling differentiation.

Update on New Aquatic Nuisance Species Introductions

Neilson gave a PowerPoint Presentation entitled "New Species Occurrences". Since October 2015, new groups of aquatic nuisance species have been observed in FL, TX, LA, GA, and MS: four fish, six mollusks, two plants, and three reptiles. These include African jewelfish, blackchin

tilapia, red-rim melania, giant applesnail, bighead carp, silver carp, green anaconda, and zebra mussel.

Discussion about the Use of Incentive Programs to Control AIS in the Region

Sommers asked the panel members how they administer incentive programs for their states. **Sommers** stated that last year, one of their Commissioners asked that they look into a program called "Lobster for Lionfish". Commercial lobstermen that brought in lionfish could harvest an extra lobster per person that they normally would not be able to do. They are also reaching out to hunting groups to assist with python control in wildlife management areas. A non-native fish roundup is also being held. A pet amnesty day is regularly held for people to turn in their unwanted pets, and potential adopters of these pets are available. They are also looking into other incentive programs.

Jacoby Carter stated that they have tour groups that view their AIS, and participants are instructed that they should not release any native or non-native species into the wild once it has been held in captivity. Barataria Terrebonne Estuary Program has an invasive roundup. Louisiana has an incentive program for nutria.

Leiva stated that in Texas, there is a feral hog problem, and a $5.00 per hog bounty was implemented. Ranchers and land owners assisted.

McMahon stated that Texas has a "Hello Zebra Mussels – Goodbye Texas Lakes" Program to make boaters aware of the danger of unintentionally transporting zebra mussels to un-infested water bodies. Signs are also posted at marinas and boat ramps. There is a fine imposed to boaters of up to $500.00 if their boat or trailer has zebra mussels attached when leaving a boat launch. Also, the boat must be drained of all water before leaving boat launches.

Update on the 2016 USFWS Region 4 AIS Small Grants Program

Ballard reported that in 2014, they were able to fund 11 projects, and all but two are finished. The other two will be finished this year. Last year, eight projects were funded.

The RFP for 2016 went out last week. The deadline is April 30th. The budget this year is lower than last year. Proposals will be ranked and combined by the individual reviewers. The list will be given to Fish & Wildlife for their consideration. The top-ranked proposals will receive funding. It is anticipated that funding will increase in coming years.

Wednesday, April 6, 2016

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

Development of Fact Sheets, New Brochures, Outreach Materials for the Region

Ballard asked the panel members if they felt there was a need to develop any new outreach materials, such as a fact sheet that is an informational overview, and region-specific. The "Help Stop Aquatic Hitchhikers" brochure that was previously done could also be updated. **Kingsley-Smith** spoke on the Southeastern Regional Taxonomic Center (SERTC), which is located in the

Marine Resources Research Institute at the South Carolina Department of Natural Resources in Charleston, SC. The Center is staffed by SCDNR employees with a background in taxonomy and serves as a clearinghouse, training facility, specimen repository, and a venue for a taxonomic library. They produce outreach materials that are available to schools, etc., and could possibly design posters of invasive species for GSARP. A poster could also be included in the Traveling Trunk for use by the school or other facility after use of the trunk.

As an Action Item, it was decided that a library clearinghouse of outreach materials would be set up on the Gulf States Marine Fisheries Commission GSARP website. **Ballard** asked the panel members to send him their state PDFs of outreach materials so they can be put in the clearinghouse.

Update on Ballast Water Treatment Technologies and Standards

Carangelo gave a PowerPoint Presentation entitled "Ballast Water Considerations". The 3rd Ballast Water Management Summit was held in February in Long Beach, CA. Topics related to ballast water, treatment technology, standards, and implementation were discussed.

There are 58 International Maritime Organization (IMO) treatment systems approved. The USCG has none, as of March 2016. Dockyard and classification societies could encounter a bottleneck in 2020, as numerous ship owners have decided to complete their International Oil Pollution Prevention Renewal Survey due to uncertainties on Ballast Water Management Convention of the IMO. However, the convention still has amendments that need to be agreed on, prior to its entry force, which are expected to near finalization during the two meetings in April and October 2016.

The U.S. Court of Appeals for the Second Circuit issued an amended version of its October 5, 2015 decision regarding the challenge to the Environmental Protection Agency (EPA) ballast water management provisions of its Vessel General Permit (VGP) program. The result remains the same, but allowed to remain in effect until new provisions can be promulgated.

Update on USFWS Region 4 Aquatic Nuisance Species Activities

Strakosh gave a PowerPoint Presentation entitled "Conceptual Framework for AIS Surveillance & Monitoring in Great Lakes". USFWS AIS early detection and monitoring in the Great Lakes Basin uses an assemblage-based approach, and can be applied for single species. The assemblage-based approach is applicable across waterbodies, and maximizes sampling efficiency/detection probability. The sampling effort can be focused from large to fine scale.

The mode of introduction is determined by identifying all potential pathways and vectors for water bodies. Areas of highest risk for potential introduction areas are identified. Physio-Geographic/Hydrographic landscapes such as harbors, coves, tributaries, currents, etc. are looked at. Spatiotemportal sampling/unique habitats are defined, and the sampling should merge spatial risk gradient and habitat extent. Methods and gear are selected to effectively cover habitat types. The effort is determined based on area, habitat availability, and targeted detection probability. The species with the highest probability of introduction from the Risk Assessments are identified.

Update on Aquatic Nuisance Species Activities in Mexico

Mendoza gave a PowerPoint Presentation entitled "Risk Assessment of the Ornamental Fish Trade in Mexico: Analysis of Freshwater Species and Effectiveness of the FISK (Fish Invasiveness Screening Kit)". There are 545 native freshwater fish species. The number of exotic species has increased from 55 in the 80s to 115 at the present, of which 67 have already become established.

The Fish Invasiveness Scoring Kit (FISK) was developed as a screening tool to access potential invasiveness of non-native freshwater fishes. The method was adapted from the Weed Risk Assessment (WRA) model. The method is semi-quantitative and provides a scoring framework for biogeographical, historical, biological, and ecological information on a species. Higher scores indicate higher risk and threshold values are established to categorize species as low, medium, or high risk. FISK can be applied to new imports and species currently in trade to reduce the probability that new invasive fishes will become established.

Recent improvements to FISK have provided a means of identifying potentially invasive non-native freshwater fishes in virtually all climate zones. The Fish Invasiveness Screening Kit (FISK) v2 was developed in a collaboration between University of Florida Fisheries and Aquatic Sciences, CEFAS, and the Florida Fish and Wildlife Conservation Commission.

Seven hundred freshwater fish species regularly traded in Mexico were filtered for synonyms and varieties, and 368 ornamental species were taxonomically validated. They were submitted to revision for previous establishment or other invasive reports. All species were ranked according to their number of reports, and the top 30 species were subjected to analysis using FISK v2. Two modeling algorithms were used for each species to evaluate climate match. After FISK analysis, species were classified into *invasive* or *non-invasive* for Mexico. Calibration was done using a Receiver Operating Characteristic (ROC) curve. Youden's index (J) was established to determine the best threshold for high-risk species. Seventeen species were classified into the high-risk category.

The First International Workshop on the Environmental Risk Evaluation for Transgenic Fish in Mexico was held on September 10-11, 2015.
In an effort to detect and monitor the spread of African jewelfish, eDNA markers were established for the species.

An alert has been issued as cobia spreads in the Pacific Ocean. The native range of Cobia includes the Atlantic and Indo-west Pacific Oceans, but not the eastern two-thirds of the Pacific Ocean. They have the potential to disrupt the area's ecosystems. They are highly migratory and cannibalistic. They adapt quickly to different water temperatures and salinity, sometimes being found in estuaries and mangrove swamps. The effects of a cobia population in the east Pacific likely will take many years to become fully evident.

Aquatic Nuisance Species Task Force Update

Strakosh reported that the next ANSTF meeting will be held jointly with the Great Lakes Panel on May 4-6, 2016 in Travers City, Michigan. The agenda and meeting details will be posted on

the website soon. Focus sessions will include the Great Lakes Restoration Initiative Project updates and inter-basin transfer of aquatic invasive species.

Invasive Species Traveling Trunk Update and Discussion

Ballard gave a PowerPoint Presentation entitled "Traveling Trunk Update July 2012 – March 2016". The traveling trunk has been utilized by organizations, schools, universities, wildlife departments, etc. Several schools regularly request the trunk now as part of their curriculum. In 2016, there has been a drastic increase of requests for the trunks. There have been instances when not enough trunks were available for requests.

When the traveling trunk was first created in 2012, it consisted of five invasive plants and six invasive animals. The contents of the trunk have not been updated since its release. **Ballard** will update the USGS distribution maps. The trunk will be updated, and new invasive species added. Other suggestions include more acrylic-imbedded specimens, a multiple-choice questionnaire for people to fill out after utilizing the trunk, hands-on activities and games to use in K-12 classrooms to illustrate the effects of invasives, a banner that can be used at public events to draw attention to the display, and a DVD and poster created or purchased that people could keep. **Ballard** suggested tailoring the trunks to the requester's needs by having a checklist to select what they want in their trunk.

Ballard asked for volunteers to help update the traveling trunk. **Akins** and **McMahon** volunteered to help.

The Education and Outreach Workgroup will have a conference call in a few weeks to discuss the updates.

Discussion about Panel Membership

Ballard stated that Earl Chilton, Don Schmitz, and Steven Rider are no longer serving on the Panel. The Sea Grant seat and Tribal seat are also open. New members for these seats will be sought. Other groups have expressed interest in sitting on the Panel; however, the budget may not support this. Panel members expressed interest in having someone from the pet industry sit on the Panel.

Establishment of a GSARP Distinguished Service Award

The panel members agreed to have an annual GSARP Distinguished Service Award. The award would not be limited to only a person - agencies/organizations would also be considered. Criteria for selection will be decided upon. A call for nominations from the Panel Members would be done annually. The award would be given at the GSMFC Annual Fall Meeting.

Ballard will create a draft of nominees from submissions by Panel members. He will then send the nominee list to the Panel members for their vote. An application form will also be created. **Ballard** will also find samples of an award that the Panel can choose on to be presented to the recipient.

A GSARP Distinguished Service Award Committee will be formed. **Kingsley-Smith, Gonzalez,** and **McMahon** volunteered to serve on the committee. Other Panel members will likely be added.

The service award will be further discussed at the next GSARP meeting.

Review and Approval of the GSARP Standard Operating Procedures

Ballard stated that a change was made to the GSARP SOP. Under Item IV. (Officers), the Panel Chair will serve a two-year term, after which time the Vice-chair will assume the role of Panel Chair through a formal Motion by the Panel.

It was also pointed out that under Item I. (Regional Panel), the wording should be changed from "The Gulf of Mexico Regional Panel on Aquatic Invasive Species", to "The Gulf and South Atlantic Regional Panel on Aquatic Invasive Species".

Ballard revised Meeting Attendance in Item II. (Membership). Any Standing or Non-standing Member that misses two consecutive meetings will be contacted by the Panel Chair or Program Coordinator to assess their intent to participate in future Panel Meetings. If it is determined that the member's participation will continue to be low, then the following actions will be taken.

Standing Member: the member's agency will be contacted and asked to provide a new representative that will be able to actively participate in Panel activities.

Non-Standing Members: the member's agency will be contacted and asked to provide a new representative that will be able to actively participate in Panel activities. If a new representative is not named, then the seat will be dissolved.

Kingsley-Smith made a Motion to accept the revised SOP. The Motion was seconded, and the Motion passed.

State Reports/ Members Forum

Alabama

Newton reported that the Asian tiger shrimp has been a species of concern since 2006, when it was first observed in Alabama inshore waters. Captures have continued to increase, and the tiger shrimp is now found in all of Alabama's primary estuary basins. There have been fewer validated commercial shrimping tiger shrimp reports; however, communications between AMRD personnel and commercial shrimpers indicate a significant abundance of tiger shrimp within Alabama waters. Other invasive species documented in Alabama coastal waters include Bocourt swimming crab, tessellated blenny, Australian spotted jellyfish, Asian green mussel, and red lionfish.

In December 2012, AMRD received a grant from the Gulf States Marine Fisheries Commission to monitor reef communities in the Gulf of Mexico, dispatch red lionfish when encountered during SCUBA surveys, increase public awareness about the lionfish invasion, and streamline the general coordination between state agencies, federal agencies, and the public. Additional

funding was received from GSMFC to continue the monitoring in 2014, and continue increasing public awareness. AMRD conducted SCUBA surveys at 18 reef sites in 2014, and created an Adopt-a-Reef Program that emphasizes the reporting and capture of lionfish. The program features a web-based application that allows for the submission and viewing of reports submitted by Adopt-a-Reef participants.

Florida

Sommers reported on the standardized electrofishing survey for non-native freshwater fish. The program was designed to monitor native and non-native fish populations in southeast Florida urban canals. Since 1997, the FWC has performed 213 surveys from 39 canals. In October 2015, six "core" urban canals in metropolitan Miami-West Palm Beach were sampled. Over 2,000 fish were collected from the canals. Eighteen species of native freshwater fish comprised the total catch, and 15 species of non-native freshwater fish comprised the remainder of the total catch. African jewelfish, spotted tilapia, butterfly peacock, and Mayan cichlid were the principal non-native fish species collected. A non-native fish new to the eastern portion of the West Palm Beach canal is the blackbelt cichlid. They are already present in the western section of this canal. FWC plans to monitor the distribution and abundance of blackbelt cichlids through angler reports and standardized electrofishing.

During a two-day mini lobster season last year, people harvesting 10 lionfish per day were allowed to harvest one lobster per day over the bag limit in an effort to increase lionfish removals. FWC staff are currently drafting a Lionfish Control and Action Plan that will address the specific needs of various regions within the state. Lionfish have recently been added to FWC's State Record Program. Divers and anglers can submit lionfish to qualify for records for largest, smallest, and heaviest lionfish. A south Florida congressman has introduced the "Finding Innovative Lionfish Elimination Technologies", or FILET Act. This bill would provide $1.5 million in competitive grants to universities and agencies to develop traps and other gear that would catch lionfish with minimal environmental impact.

The FWC was recently allocated additional funding to expand the Reef Rangers Program. Two dedicated FWC staff will now address statewide lionfish issues. Total funding for lionfish management for FY2016/2017 will be over $500,000.

In March 2016, a bullseye snakehead was recovered from the West Palm Beach canal. Now bullseye snakeheads have access to an extensive canal system connected to Lake Okeechobee to the north, federal and state lands to the southwest, and a large urban drainage system to the southeast.

The quilted melania is a non-native thiarid snail threatening single-spring systems in Florida. Once the snails begin reproducing in a new area, they migrate upstream and downstream. Efforts are underway to prevent the introduction of this snail into new spring systems and to learn more about their biology and ecology to minimize their potential impact on imperiled native snail species.

During February 2014 – December 2015, FWC has examined 412 American eels for *Anguilla rostrata*, a non-native species of nematode. The eels were collected by electrofishing from nearly

50 freshwater systems in Florida. The St. John's River had the highest incidence of infection. Of the 172 eels collected, approximately 56% contained active infections. Preliminary data suggests that the average number of nematodes and the percent of American eels with active infections were lowest in summer months (July-September). Additional samples will be processed in coming months, and final results and report will be completed by fall 2016.

Four sightings of green anaconda in Collier, Osceola, and Brevard counties have been verified. Two snakes were removed by FWC law enforcement. This snake is listed as a Conditional Species, and personal possession is no longer permitted.

The FWC recently completed a month-long 2016 Python Challenge™ in February. The primary goals of this event were to raise awareness, educate and engage the public on non-native species issued in Florida, focusing on the Burmese python. During the event, 106 pythons were removed by participants. As part of the 2016 Python Challenge™, an Invasive Species Awareness Festival was held in Miami in January. A variety of educational exhibitors, vendors and presentations were featured at the festival. To promote consumptive use of non-native species, a chef prepared bullseye snakehead, lionfish, and green iguana to serve to attendees.

Planning is underway for the 2nd Annual Lionfish Removal and Awareness Day scheduled for May 14-15, 2016, which will be held in Pensacola. Satellite festivals will be held in Sebastian and Panama City. These sites will host a tournament, lionfish tastings, and educational conservation exhibitors and vendors.

Phillips reported on invasive plant management activities. Invasive, non-native plants were reported in 97% of Florida's 457 surveyed public lakes and rivers. Floating water hyacinth and water lettuce covered approximately 125,000 acres of Florida public waters. Managers spent approximately $5.6 million controlling over 45,000 acres of floating invasive plants in Florida public lakes and rivers during FY2014/2015. Hydrilla was reported in 181 public waters in 2015. During FY2014/2015, managers spent $5.49 million applying herbicides to 9,000 acres of hydrilla in Florida public lakes and rivers. During FY2014/2015, $5.99 million was spent managing over 20,000 acres of aquatic plants other than hydrilla and floating plants.

Georgia

Bonvechio reported on the Satilla River Flathead Catfish Removal Project. Despite efforts to remove flathead catfish from the Satilla River, the number and size of the catfish continues to increase. At present, the project funds two positions focused on long-term population control through direct removal of flathead catfish. During the 2015 sampling season, over 8,000 pounds of catfish were removed. Suppression of the flathead catfish population in the Satilla River has been demonstrated through measured changes in biomass, size, and age-structure. Ongoing intensive harvest will be required to prevent the flathead population from rebuilding.

Asian carp continue to move up the Tennessee River system in Alabama. Special seining/cast-netting closures on TN drainage streams may be warranted in the future. The most likely vectors for the spread of Asian carp into GA waters seems to be inter-basin transfer via angler bait buckets. Year-of-young Asian carp can be easily mistaken for gizzard shad, and can be

inadvertently collected while cast-netting for bait, and then brought back to GA. The movement of Asian carp up the TN River system is being continuously monitored.

Several patches of water hyacinth were found in August 2015 below Shriners Lake and the downstream creek one mile from the main stem of the Satilla River. In February 2016, a site visit revealed that a frost had killed 95% of the standing water hyacinth.

In January 2015, giant salivinia was discovered in a pond in Evans County. The contamination originated from an upstream pond, which had 100% coverage of giant salvinia. The infested areas were treated with herbicides, and complete control was achieved within 90 days. These areas will be monitored and retreated as necessary.

The GA DNR is instituting a protocol to collect and test grass carp in a proactive effort to monitor grass carp ploidy, and to minimize the potential establishment of wild grass carp populations in state-managed water. From November 2014 – April 2015, 10 grass carp were captured from public small impoundments and public rivers and submitted for triploid testing. All 10 of the fish tested positive as triploids.

Louisiana

Reed reported that Asian carp are invading LA rivers, streams, and reservoirs. A recent 2013/2014 study indicated they are now successfully reproducing in the Atchafalaya, Ouachita, and Red Rivers of LA. LDWF is continuing to monitor the status and spread in state waters.

Apple snails have colonized the waters of southeastern and south central LA in the lower Atchafalaya and MS River basins during the past decade, and appear to be spreading more rapidly and distant in 2015. They have now been observed in 19 of the state's 64 parishes. LDWF and other entities will continue to research and monitor for apple snails, and public educational outreach through several media outlets is currently being conducted.

LDWF received 94 tiger shrimp reports in 2015 from commercial and recreational fishermen along the LA coastline. Almost all of the sightings were in nearshore/bay areas during the months of August and September.

Commercial divers performing 24 platform structure inspections on oil and gas platforms reported 191 lionfish sightings in 2014. Depths of sightings ranged between 40'-181'.

Alex Perret provided a LDWF Aquatic Plant Control Program report. For FY2013/2014, over 79,000 acres of aquatic plants were treated using chemical, mechanical, and biological methods. Trials were done from September 2013 – July 2014 on giant salvinia with alternative herbicides and mixes to determine if new mixes are as effective as the glyphosate/diquat mix, and to determine if the mixes are affected by season. Results of the trials revealed that glyphosate plus low rates of flumioxazin or carfentrazone provided control and rapid visual markers, and are compatible tank mix partners. There were minimal surfactant differences, and all combinations were more effective in the spring than the fall - especially endothall + flumioxazin. Carfentrazone alone or in combination with glyphosate provided 72 – 99% control. Recent and current trials were done in august 2014 and January 2015. Effective herbicide mixes in large

scale field trials will be evaluated. Other combinations and different surfactants will also be evaluated.

Mississippi

Burris reported that four giant apple snail egg masses were destroyed in Robinson Bayou in the Pascagoula River during weekly, warm-season apple snail control missions. Compared to last year, the number of egg masses has greatly decreased. Three live snails were captured and tested for rat lung worm parasite, and all tested negative.

Following a heavy rainfall event in March, a large amount of common salvinia and alligatorweed was observed exiting the mouth of the Pearl River and flowing into the Mississippi Sound. A new infestation of giant salvinia in an early stage was discovered in Hancock County. It is undergoing treatment.

MDMR personnel worked with MS Habitat Stewards to kill 350 Chinese tallow trees in the DeLisle Costal Preserve.

MDMR personnel attended a regional wild hog summit meeting held to increase legislative awareness of the environmental and economic impacts of this invasive species.

Riecke provided the freshwater report. The first meeting of the Mississippi Aquatic Invasive Species Council to guide implementation of the activities specified in *the Mississippi State Plan for Aquatic Invasive Species* is scheduled for April 14, 2016.

The proposal to use federal ANS funds for Asian Carp telemetry study in the Tenn-Tom Waterway, budget, and contract documents have been submitted to MDEQ.

Giant salvinia, hydrilla, alligatorweed, and water hyacinth have all been chemically treated in various water bodies around the state.

Receivers and sonic tags have been purchased to tag and track silver carp in the Tenn-Tombigbee Waterway. Receivers have been deployed in various locations on Pickwick Lake on December 10, 2015.

Silver carp were recently caught in the Pearl River below Ross Barnett Reservoir.

Links to the MS River Basin Panel on Aquatic Nuisance Species, Gulf and South Atlantic Regional Panel on Aquatic Invasive Species, Stop Aquatic Hitchhikers, and Habitattitude websites are on the MDWFP website.

Special harvest permits continue to be issued to Moon River Foods to use gear that is otherwise illegal, to harvest Asian carp in lakes and rivers. Monitoring is being done on harvest, numbers, and pounds of carp harvested. A notice was placed on the MDWFP website that Moon River Foods was buying Asian carp. The company has shipped over 500,000 pounds of carp to China.

Freshwater fishing live bait regulations are being composed to specify what live bait can be legally sold, possessed, transported, and used in Mississippi. Legislation approval is being sought to initiate licensing of retail bait outlets that sell live freshwater fishing bait.

North Carolina

Emens reported that since September 2014, NC WRC biologists have documented new biological threats to salmonids within the state. Gill lice have been found on brook trout and rainbow trout populations. Taxonomic and molecular analyses of copepod collections are ongoing. Anglers have been asked to report observations of gill lice, and NC WRC will continue sampling brook trout populations to document the distribution and status of gill lice.

The Chinese mystery snail is found in numerous water bodies in NC. Inland Fisheries staff will continue to monitor for this species, and is in the process of planning educational seminars for the public.

Whirling disease was confirmed in rainbow trout in July 2015 collected from the Watauga River. It has also been identified in the Elk River. NC WRC personnel collected *Tubifex tubifex*, the worm host of the parasite, to test for the presence of *Myxobolus cerebralis*, the parasite that causes whirling disease. The *T. tubifex* from Mill Creek and the Watauga River tested positive. The NC WRC initiated testing of self-sustaining wild trout populations in spring 2016 for the presence of *Myxobolus cerebralis* and whirling disease.

The funding mechanism for the Aquatic Weed Control Program is the Shallow Draft Navigation Channel Dredging and Lake Maintenance Fund, of which up to $500K can be used for aquatic weed control. Money comes from a percentage of the motor fuel tax and a portion of money collected from boat titles and registration. The funds are specific to "waters of the state located within lakes". At this time, no funding is available for projects at rivers, creeks, canals, bays, sounds, marshes, etc. Hydrilla has been treated at Lake Waccamaw, Lake Gaston, Eno River, Albemarle Sound, and Chowan River. The Albemarle-Pamlico National Estuary Partnership is forming a Hydrilla Technical Advisory Group, and the group will draft an action plan on how to monitor and manage hydrilla.

Blue catfish have recently become a topic of concern again in some parts of NC. Their range has been expanding over the years, and commercial landings have been increasing. Much of the concern is centered on HR 2419 (The Farm Bill) and a provision intended to impact imported aquaculture-raised fish. Cost of inspection will hinder the management of this invasive species.

The NC Aquatic Nuisance Species Management Plan has been finalized by the working group, and has been signed by all three departments. There is currently no plan for submission to the National ANS Task Force for approval.

South Carolina

Kingsley-Smith reported that researchers have visited two ponds in West Ashley with an established island apple snail population since May 2015 on a bi-weekly basis to determine seasonal patterns of abundance and size-frequency distribution of juvenile and adult snails, as well as egg mass production, and the relationships with physical parameters associated with

these ponds. All snails and accessible egg masses were destroyed. Over 1,500 live apple snails have been removed from the two ponds, and 4,850 egg masses have been observed. The accessible masses were destroyed. Additional surveys were done to determine the extent of the spread. Between May and September 2015, 100 stormwater ponds were surveyed from across the five coastal SC counties. During sampling, an additional invasive freshwater snail, *Melanoides tuberculata*, was discovered. The survey was expanded, and three additional invasive freshwater snail species were discovered. *Bellamya japonica* and *Biomphalaria havanensis* had previously been observed in SC; however, *M. tuberculata* and *Pyrgophorus parvulus* had never been reported in SC.
SCDNR will examine apple snails for the presence of rat lung worm parasite in 2016. Lung and mantle tissue from 100 snails from each infected pond system will be examined microscopically, and with qPCR techniques. In addition, sex is determined for the sex ratio in each area.

Researchers at the Marine Resources Research Institute want to learn the current status of efforts by the USGS researchers to use genetic approaches to try to identify the geographic origins of Asian tiger shrimp established on the Gulf and Atlantic coasts. It is hoped that answers will be answered regarding the status of their establishment, the number of releases, and the population structure in its introduced range.

Researchers at the SCDNR recently found that at least 45% of American eels are infected in the estuaries of SC with *Anguillicoloides crassus*, a nematode of Asian origin that infects the swimbladder. Young glass eels become heavily infected within months of recruiting to the Goose Creek Reservoir. Genetic tools that enable scientists to assess whether different habitats harbor the parasite will assist managers in monitoring and reducing the spread of the parasite in North America. Previous USFWS funding during FY2015 enabled SCDNR researchers to successfully develop a species-specific qPCR assay for *A. crassus*. Through continued funding from USFWS in FY2016, this research team was able to further refine the qPCR technique. This improved molecular detection tool has now been applied in a ield setting to test whether it could be used to detect *A. crassus* in different types of samples acquired from the Goose Creek Reservoir.

Texas
McMahon reported that they have been focusing on zebra mussel infestations in Lake Texoma, Ray Roberts Lake, and Lake Belton. It has been observed that the zebra mussels grow faster and have shorter life spans in Texas than anywhere else. Also observed is that within 2-3 years after initial reports of zebra mussel maximum densities, all of the populations collapse. It is believed that they eventually starve themselves out. When water temperatures rise above 25 degrees, they cannot feed mechanically by filtering fast enough to support their metabolic rates and go into a negative energy balance. A long-term study is being done on this situation.

HARC
Gonzalez reported that the Texas Lionfish Symposium was held in February 2016 in Corpus Christi, TX. A public forum was held at the Texas State Aquarium. Presentations on lionfish were given for the public. Approximately 50-60 people attended.

For the first time since 2009, the Galveston Bay Estuary Program held a symposium in Galveston, TX. The invasive species panel was very well attended.

REEF

Akins reported that REEF has an online reporting format for people to report sightings of non-native fish. Over 200 lionfish reports are received yearly. In January 2016, reports were received of an orbiculate batfish and sailfin tang near Ft. Lauderdale. Efforts to locate the fish for removal were unsuccessful.

Regal damsel fish have been sighted in Vera Cruz, Mexico. Approximately one month later, they were also reported 200 miles north of the previous range. This species is expanding faster than previously thought.

Funding has been received again for the "Don't Release Me" program, and 10,000 aquarium bags will be printed. Informational brochures are included with the bags.

The iPhone Regional Lionfish Sightings app is available for download. Sightings of lionfish by region for the last 30 days can also be viewed.

The second edition of the lionfish cookbook has been released. The first edition sold out. This edition contains 16 additional recipes from celebrity chefs all around the Caribbean.

REEF has organized four lionfish derbies this year. The Palm Beach derby will hold a lionfish culinary competition. The winner will receive a golden ticket to the world culinary competition.

Acoustic tagging of lionfish will be done this year in the USVI to observe movement between different patch reefs.

USACE

Lane reported that DMMAs (Dredge Management Material Areas) are infested with invasive species in Florida. Funding is being received for management of DMMAs in Tampa and Jacksonville.

The biocontrol project for the everglades restoration is in operational phase. Insects have been released onto melaluca, lygodium, schinus, and casuarina. Implementation and monitoring efforts are projected for 25 years.

Funding was allocated for the USACE 2016 budget for aquatic invasive species protection under the 2014 Water Resources Reform and Development Act, which was passed into law in June 2014. That law requires the money to be cost-shared with the four Northwest states in a 50/50 partnership. The money will help pay for new watercraft inspection stations in the Columbia River basin in the eradication effort against quagga mussels, zebra mussels, and other aquatic invasive plant and animal species.

Grass carp will be used to control hydrilla in the Strom Thurman Reservoir.

The University of Florida is assisting with the development of chemicals for invasive aquatic grasses. Initial trials have shown that it is a good management tool for grasses in aquatic systems.

USGS

Neilson reported that they have recently re-done their point map page to make it more user-friendly. They have also re-formatted their reporting page to be more mobile-friendly.

Discussion of ANSTF Recommendations

Provide increased financial support to the panels and identify alternative funding sources that the panels can utilize to support annual meetings, coordination, and panel activities. **McMahon mad a Motion to accept the Recommendation. The Motion was seconded, and passed**.

Have the ANSTF host an international symposium on the use of CRISPR, including gene drives, as a control tool for AIS. **Teem made a Motion to accept the Recommendation. The Motion was seconded, and passed**.

Other Business

Emens discussed the Mid Atlantic meeting. The Chesapeake Bay Nutria Eradication Project has been successful. In the Chesapeake Bay, nutria are primarily limited to the Delmarva Peninsula, where they have been found in six Maryland counties and portions of Delaware and Virginia. The project has successfully reduced the original population. To date over 13,000 nutria have been removed. Population delineation surveys determined that an additional 100,000 wetland acres were nutria-free.

Asian water buffalo calves have been used to remove aquatic invasive vegetation, specifically canary grass. The buffalo were allowed to graze daily, then removed in the evenings. They consumed approximately 50 lbs. of vegetation daily in 50 days. Native plant species then began to re-emerge.

Snakehead in the Potomac are being monitored by USFWS. The population continues to expand into various water bodies.

Next Meeting Time and Place

The location of the next meeting will be Lafayette, Louisiana.

The next meeting will take place the first week in October.

Public Comment

Kristin Sommers 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 5:00 p.m.