GULF & SOUTH ATLANTIC REGIONAL PANEL
ON AQUATIC INVASIVE SPECIES
MINUTES
Thursday, May 11, 2017 – Friday, May 12, 2017
Savannah, GA

On Thursday, May 11, 2017 Chairman **Kristen Sommers** called the meeting to order at 8:00 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
Rick Burris, MS DMR, Biloxi, MS (via conference call)
Corrin Flora, NC DEQ, Elizabeth City, NC
Mark Ford, NPS, New Orleans, LA
Pam Fuller, USGS, Gainesville, FL
Lisa Gonzalez, HARC, The Woodlands, TX
Leslie Hartman, TPWD, Palacios, TX
Tom Jackson, NOAA, Miami, FL (via conference call)
Chuck Jacoby, Indian River Lagoon National Estuary Program, Palatka, FL
Peter Kingsley-Smith, SC DNR, Charleston, SC
David Knott, At-Large Member, Charleston, SC
Jon Lane, USACE, Jacksonville, FL
Leigh McDougal, USFS, Atlanta, GA
Monica McGarrity, TPWD, Austin, TX
Robert McMahon, UT Arlington, Arlington, TX
Matt Neilson, USGS, Gainesville, FL
Stephanie Otts, MS-AL Sea Grant, University, MS
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
Jessica Spencer, USACE, Jacksonville, FL
Timothy Strakosh, USFWS, Atlanta, GA
Catherine Toline, NPS, Charleston, SC
Linda Walters, UCF, Orlando, FL
Cindy Williams, USFWS, Atlanta, GA

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

Others
Chip Bates, GA Forestry Commission, Statesboro, GA

Wesley Daniel, USGS, Gainesville, FL
Stephen Davis, TPWD, Austin, TX
David Hammond, Greenbrae, CA
Casey Hares, Lochow Ranch Pond & Lake Management, Bryan, TX
Chris Harper, GA DNR, Richmond Hill, GA
Maya Hosabetta, USGS, Gainesville, FL
Bridget Lassiter, NC Dept. of Agriculture, Raleigh, NC
Julie Nachtrieb, USACE, Lewisville, TX
Ian Pfingsten, Institute for Applied Ecology, Corvallis, Oregon (via conference call)
Andrea Wylie, FL FWCC, Tallahassee, FL

Public Comment

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

Adoption of Agenda

After a minor change to the agenda, **a motion to adopt the agenda was made, and passed unanimously.**

Approval of Minutes

The minutes of the October 4-5, 2016 meeting in Lafayette, LA were presented for approval.

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

Giant Salvinia Eradication

Chris Harper gave a PowerPoint presentation entitled "Giant Salvinia Eradication in Evans County, Georgia". Control methods used include salvinia weevils, mechanical removal, water level drawdown, and chemical. In January 2015, giant salvinia was discovered in Strickland Pond and Shuman Pond. The cause of the introduction is still unknown. Due to winter water temperatures and a wet spring, treatment didn't begin until April 2015. An initial pond treatment of 40 ppb liquid Sonar and 30 ppb granular Sonar was done. A 1% diquat solution has been used for all land applications and follow-up pond treatments. The team has spent more than 300 hours on inspection and treatment. Over $2,000 worth of chemicals and equipment have been purchased. Follow-up treatments are being conducted every 3-4 weeks. New-growth plants continue to be found. Follow-up treatments will continue into 2017 to ensure 100% eradication.

Cogongrass Management

Chip Bates gave a PowerPoint presentation entitled "Cogongrass Management in Georgia". The Georgia Forestry Commission spearheads the cogongrass "Task Force" which is 23 state, federal and private partners that established the entire state of Georgia as a Cooperative Weed Management Area for cogongrass in May 2008. The combined effort of this group has had far reaching impacts in educating the public about cogongrass, as well as helping to locate all infested sites. The education efforts have been successful, and initial cogongrass reports are being filed from private landowners, industry foresters, and some logging operations. Forest

health training was provided on 87 occasions with 35,289 attendees being reached. During 2016, 101 new cogongrass infestation sites were reported and treated, which is a slight increase in new detections over the past three years. In Georgia, 59 counties have now identified cogongrass infestations involving 1,053 sites across 270 acres. Schley County, located in southwest Georgia, was the only new county that cogongrass was detected in 2016. Most infestations in Georgia are approximately a quarter acre in size, and all known sites have being treated at least once. Approximately 81% of all known sites are being reported as negative for cogongrass, and 637 sites have been declared eradicated.

Georgia's ANS Activities and Happenings

Bonvechio gave a PowerPoint presentation entitled "Georgia's ANS Activities and Happenings". In an effort to reverse the impacts of flathead catfish on native fish populations, the GA DNR Wildlife Resources Division fish management section began removing flathead catfish from the Satilla River as time permitted. In 2006, the Satilla River Flathead Catfish Removal Project (SRFCRP) was instituted using legislative-appropriated funding. At the present, the project funds two full-time positions and three part-time positions that are focused on long-term population control through direct removal of flathead catfish. During the 2016 sampling season, 7,747 fish were removed, totaling 20,188 pounds. Since 2007, more than 64,000 flatheads have been removed.

Suppression of the flathead catfish population in the Satilla River has been successful. However, higher recruitment and earlier maturation of flathead catfish is being observed. Ongoing intensive harvest is required to prevent the population from rebuilding. It appears that successive high water periods from fall 2012 to spring 2014 helped the population rebound.

In May 2011, seven nonnative blue catfish were collected in the Satilla River. There have been additional collections since then. There was an explosion of recruitment in 2016, which is a concern for resource managers. Continued monitoring and removal of the species will occur.

Asian carp continue to move up the Tennessee River system in Alabama. There are several small and medium-sized creeks and larger rivers that flow out of Georgia, many from larger reservoir systems into the Tennessee River system. The movement of Asian carp up the TN river system in AL will continue to be monitored, along with active participation on the OH River Asian Carp Planning Team.

Yellow perch has been reported for the second time in the past few years. The first was an angler's catch out of the Oconee River. The second report was from an angler's catch in the Altamaha River. They have been found further upstream in the Ocmulgee, and several reservoirs.

A 10-inch brown haplo was caught in the Flint River in October 2016. This was most likely an aquarium-released fish. This is the first documented case of these fish being found in the wild in Georgia.

In a proactive effort to monitor grass carp ploidy, and to minimize the potential establishment of wild grass carp populations in state-managed waters, the GA DNR Fisheries Management Section instituted a protocol in 2014 to collect and test grass carp ploidy.

Georgia's best smallmouth bass fishery, Lake Chatuge, was lost to illegally-stocked spotted bass. The only remaining smallmouth bass fishery, Lake Blue Ridge, is also threatened by spotted bass competition. The genetic purity of shoal bass is compromised due to the illegal introduction of spotted bass in the Flint River.

Zebra mussels, which were introduced in the Great Lakes in 1985, are moving south. They are now found in Tennessee and Alabama, and are likely carried into Georgia on boats.

Whirling Disease and Didymo are two diseases threatening Georgia trout populations. Whirling Disease can cause 90% or greater mortality of young rainbow trout, and can have serious impacts to wild and hatchery trout populations. Didymo is a freshwater diatom that produces thick algae mats along stream bottoms. The mats can be so thick that they alter stream habitats, and make fishing difficult. It can be spread easily from one water body to another.

Wooly Frogs Mouth (*Philydrum lanuginosum*) found in Pender County, NC; A First Find of this Invasive Plant in the U.S.

Bridget Lassiter gave a PowerPoint presentation entitled "Wooly Frogs Mouth (*Philydrum lanuginosum*) found in Pender County, NC; A First Find of this Invasive Plant in the U.S." Wooly frogs mouth is an invasive weed found in Pender County, NC in August 2016. The plant had rapidly overtaken an artificial pond located on private land near Holly Shelter Gamelands, where the Wildlife Resources Commission had checked for populations of a rare gopher frog. The plant was identified by botanists at North Carolina State University and the USDA. A 5% of glyphosate (Rodeo) was sprayed in October 2016. Eradication efforts are ongoing, and monitoring of this site will continue for several years. Other ponds in the Holly Shelter area were inspected for additional population of the plant.

This is the first reported find of this weed in the US, which is outside of its native range. The plant is commonly cultivated as an aquatic plant in Australia, and seeds and plants are readily available for purchase online. The plant is self-pollinating and produces millions of seeds that readily germinate in water. The seeds are dispersed by birds, wind, and people.

Based on the species' behavior and other aspects of its biology, it is believed that it has a high capacity to establish and spread. Based on the abundance and density of plants, it is also believed the plant could affect local species diversity, and may present a threat to threatened and endangered plant species that are restricted to marshes, bogs, and other similar habitats. Based on three climatic variables, it is estimated that approximately 27% of the southern coastal region of the US is suitable for establishment.

Update on New Aquatic Nuisance Species Introductions

Neilson gave a PowerPoint Presentation entitled "New Species Occurrences". Neilson stated that NAS alerts are generated when a species is new to one or more geographic levels in a country state, drainage, or county, and is observed within the last six months. Since 2016, eight fish, 14 mollusks, six plants, and one turtle have been identified in Florida, Texas, Georgia, Louisiana, Mississippi, and North Carolina. Two are new to the US, four are new to the state, 16 are new to drainage, and seven are new to the county.

Update on the Lone Star Lionfish Symposium

Hartman gave a PowerPoint Presentation entitled "Summary of the Lone Star Lionfish Symposium". The mission of the Lone Star Lionfish Symposium is to create a pro-active, unified Texas approach to managing the lionfish invasion through outreach, and the creation of a multi-disciplinary State Management Plan. Multi-disciplinary input is provided by biologists, engineers, outreach and marketing specialists, law enforcement, lawyers, industry experts, educators, economists, and recreational interests.

The 2nd Annual Lionfish Symposium was held in Galveston, Texas on February 15-16, 2017 to continue the work begun last year to determine how to manage the invasive lionfish. The Symposium also hosted a public forum on Feb. 15 at the Moody Gardens Discovery Pyramid. The Lone Star Lionfish Symposium was co-sponsored by the Texas Parks and Wildlife Department, the Houston Advanced Research Center (HARC), and the NOAA Flower Gardens Bank Marine Sanctuary. Topic areas included outreach, research, policy, priority areas, control/management, funding, and uses/markets. State topic area tasks were prioritized.

Friday, May 12, 2017

The meeting reconvened at 8:00 a.m. The Chairman again provided the opportunity for public comment. No comments were received.

Biological Control of Aquatic Invasive Species by the U.S. Army Engineer Research and Development Center

Julie Nachtrieb gave a PowerPoint Presentation entitled "Biological Control of Aquatic Invasive Species: U.S. Army Corps of Engineers". Current biological projects include giant salvinia, hydrilla, alligatorweed, and water hyacinth. Two leaf-mining flies, *Hydrellia pakistanae* and *Hydrellia balciunasi*, are being used in the control of hydrilla. Over 28 million flies were released at 30 sites in six states, and have become established in 80% of the sites. Impacts are highly variable. Parasitism by a native wasp has also been helpful.

There are multiple hydrilla genotypes in the US. Current work involves prioritizing agents, seasonal phenology and herbivory studies, and working with CSIRPO to determine identity of specimens and initiate cultures.

Giant salvinia is present in at least 12 states. Salvinia weevils have been successful at controlling giant salvinia in 15 countries, but success remains low in the US.

Over 716,000 weevils were released in 2016. Plant quality and overwintering success are both limiting factors.

Water hyacinth is widespread in the southeastern US. Biocontrol was initiated in the 1970s. *Megamelus scutellaris* is a small planthopper native to South America whose nymphs and adults feed on the sap of waterhyacinth. The insect's population increases rapidly, which enables it to quickly impact the waterhyacinth population. Since 1974, $112 million has been spent on control

and research. Water hyacinth impacts recreational freshwater fishing, recreational waterfowl hunting, boat-related businesses, and drinking water supplies.

Alligatorweed is largely limited to the southeastern US. The alligatorweed flea beetle (*Agasicles hygrophila*) has been an extremely effective biological control agent in coastal regions of the southeastern United States. Because the beetles cannot survive exposure to winter temperatures, populations of the insects are routinely re-established in the northern inland areas.

Overview of Cyanotoxin Research Funded Through the Small Grants Program

Susan Wilde gave a PowerPoint Presentation entitled "Invasive Plants, Toxic Cyanobacteria, & Fish and Wildlife Health". Cyanobacteria (or blue-green algae) are photosynthetic bacterial species that can produce liver and nerve toxins. It grows as an epiphyte on hydrilla and other invasive exotic aquatic plants in all AVM (avian vacuolar myelinopathy) sites. It causes neurological impairment such as waterfowl and eagles wobbling in flight, birds observed stumbling on land, coots diving and then not righting themselves, and eagles that may overshoot perches or fly into objects. Unique brain lesions are diagnosed, consisting of open spaces in white matter of the central nervous system, specifically an intramyelinic edema. AVM has also expanded to include fish, salamanders, frogs, mammals, turtles, crocodiles, alligators, birds, lizards, and snakes.

An AVM study was done on triploid grass carp susceptibility and potential for disease transfer when used to control aquatic vegetation in reservoirs with AVM. No mortality or abnormal behavior was found in treatment or control fish in the laboratory study. Chickens consuming grass carp did not develop AVM lesions. A study was also done on evaluating behavioral and physiological responses of triploid grass carp consuming hydrilla. Swimming performance results showed that AVM (+) significantly differ after 14 days, and there was a 45% decline in swim performance of toxic group compared to control. In a feeding experiment with painted turtles that were fed Aetokthonos-positive hydrilla, all turtles exhibited associated clinical signs of VM after 80-90 days. These signs included off-balance swimming and floating, weakness, lethargy, anorexia, and ataxia.

Potentially toxic cyanobacterial colonies grow on hydrilla and other aquatic plants. Apple snails readily consume hydrilla and other aquatic vegetation. Native and invasive apple snails are consumed by snail kits, which are endangered in Florida. Apple snails make up over 99% of the snail kite diet. In a feeding trial, apple snails were fed infected hydrilla. Three out of five birds that consumed the snails displayed clinical signs.

To screen for toxicity, aquatic vegetation is collected from AVM and non-AVM locations and screened for *A. hydrilla* cyanobacterial colonies. The toxin is extracted with methanol, and partitioned into chloroform. Bioassays used include avian, *in vitro*, and invertebrates. *In vivo* bioassays show promise for AVM toxicity studies.

A study was done on amphibian and reptile vulnerability to hydrilla invasions and the spread of *Aetokthonos hydrillicola*. The objectives were to determine whether paedomorphic mole salamanders are affected by *Ah* by consumption of *Ah*+ gut-loaded intermediate food source. Both snails and tadpoles were gut-loaded. Prey were fed hydrilla that had either Ah+ or were Ah.

Every prey fed on hydrilla for at least 24 hours. Righting response results included: seizures, partial and total paralysis, head twitching, and muscle atrophy. Other neurologic signs were: tail curling, listing, inability to balance and hold head up, and curving body in one direction and inability to straighten out.

A study was done to evaluate sensitivity of northern and banded watersnakes to *Aetokthonos hydrillicola* exposure through experimental trophic transfer study. Behavioral responses included: reduced appetite, slow righting response, and reduced tongue-flicking.

Consumption of impaired/dead waterbirds eating hydrilla/*Ah* is a threat to bald eagles. Food web toxin transfer causes impairment/mortality to freshwater turtles, tadpoles, snakes, and fish.

Range Expansions of Introduced Aquatic Plants in the USFWS Southeast Region

Ian Pfingsten provided a PowerPoint Presentation entitled "Range Expansions of Introduced Aquatic Plants in the USFWS Southeast Region". There are over 69,000 records for 90+ nonindigenous plant species in Region 4 in the Southeast US. Most are freshwater species. In the Gulf and South Atlantic region, plant alerts include: water hyacinth, cape blue waterlily, giant salvinia, water lettuce, tropical nutrush, red root floater, tropical American watergrass, feathered mosquitofern, and crested floating-heart.

In Region 4 of the southeastern US, the focus is on range expansion since 2001 by HUC-8 drainages. There are 14 previously-established plant species, and nine newly-introduced plant species. Availability in the commercial trade, and risk assessments are also researched.

Results of EarthTec QZ Field Trials for Control of Zebra Mussels

David Hammond provided a PowerPoint Presentation entitled "EarthTec QZ: Control of Dreissenid Mussels through a more Rational Use of Copper". EarthTec is an example of Green Chemistry: a safer and more efficient formulation that achieves the desired benefits at lower doses, with less waste. The copper dose required to achieve a given % inhibition of algal growth is much lower if applied as EarthTec than if applied as copper sulfate. When copper sulfate treatment was switched to EarthTec treatment by a customer, there were fewer total applications per year, applied only 19% of the elemental coper used in previous years, and the treatment season spanned a longer portion of the year.

Zebra mussels have historically infested the intake structure, and fouled the intake screens and raw water pipeline of a major municipal water treatment plant in the Midwest. They are usually removed manually by workers scraping them off the pipe and intake screen. This represents a worker safety hazard, requiring Tyvek suits and respirators.

In summer 2016, zebra mussel control was done using EarthTec QZ. The results of treatment with 1ppm QZ ensured intake screens and the pipeline were free of zebra mussels during the height of the mussel season. EarthTec QZ successfully prevented biofouling in Summer-Fall of 2016. Intake gates also remained free of zebra mussels after treatment. Recent treatments to control mussels using EarthTec QZ have also been done in open waters of lakes in Minnesota.

EarthTec has a 15-year history of use in fish farms. The procedure is started at the shoreline, and moved outwards in bands, allowing fish to move to untreated areas. Treatment is applied at doses that fish tolerate, but mussels do not.

Discussion about Sponsoring an International Symposium on Snakeheads

Ballard stated that Dwayne Chapman of the USGS contacted him to inquire if the GSARP would be interested in sponsoring the symposium. The Mississippi River Basin Panel has offered to contribute $20,000 in support. They put in a proposal to the Mid-Atlantic Panel for $15,000 in support. It will be put on by the Virginia Chapter of the American Fisheries Society, and probably held at one of their chapter meetings. The tentative date would be in May 2018. The symposium would offer conference to managers, scientists, conservationists, and anglers with the most current information on snakehead biology and ecology. The goal is to foster better understanding and improved knowledge of snakeheads. The minutes from the symposium will be published as an AFS proceeding. The monetary contributions would cover travel for speakers, the facility fees, and the publication costs.

A Motion was made to contribute $2,000 to the symposium. The Motion was seconded, and the Motion passed.

Aquatic Nuisance Species Task Force Update

Williams stated that the ANS Task Force meeting was canceled due to USFWS not advertising the meeting in advance in a timely manner in the Federal Register.

Williams is the new USFWS Invasive Species Coordinator. The USFWS budget office sent her a list of over 40 grants that date back to 2003 that have never been properly closed. She is working on getting those grants closed. A better budget management tracking system has been implemented. When grants are awarded, a letter will be sent listing requirements and due dates for submitting final reports. Not submitting final reports could affect future USFWS funding.

Update on the Invasive Species Traveling Trunk Revisions

The Education/Outreach Committee provided an update. **Ballard** reported that he has ordered new, larger trunks to accommodate the growing number of invasive species that are being added to the trunks. New invasive species that will be added are two Asian carp species. The fish replicas are flexible plastic molds of actual Asian carp fish, mounted on a base. More slides will also be added to the presentation. The trunk's packaging materials and containers have also been updated to give a more professional appearance.

Gonzalez reported that they are attempting to locate "hands-on" material on feral hogs, such as a skull or tusks.

Ballard reported that he wants to obtain an invasive species poster for the trunks that teachers can keep and display in their classrooms. He also wants to have an invasive species banner made that can be displayed at public outreach events.

Knott asked how much the traveling trunks have been utilized. **Ballard** stated that since their inception in 2012, the two trunks are averaging over 250 days per year of use. The months of

February through May are the most requested for the trunks. Some agencies use the trunks for a month at a time for outreach events. Typically, there are no requests for the trunks in November and December.

Discussion of GSARP Distinguished Service Award Nominations

Ballard reported that a fillable PDF nomination form has been created. The nominee's CV can also be attached to the form for submission. **Ballard** emailed information about the form, along with a link to the actual nomination form to GSARP members. Only one nomination has been received, thus far. **Ballard** stated that he will send the link again. Voting will be done via email to select the award recipient.

State Reports/ Members Forum

Alabama

Asian tiger shrimp distribution was primarily restricted to Alabama's southern inshore waters from 2006-2009. However, its distribution extended to northern Mobile Bay and into Perdido and Wolf Bays in 2011. The forty-three confirmed reports during 2011 indicate the tiger shrimp occurs within all of Alabama's primary estuary basins. AL MRD received fewer validated reports from the commercial shrimping industry in recent years than in previous years, but communications between AMRD personnel and commercial shrimpers indicate that a significant abundance of tiger shrimp occur within AL waters.

Reports being made by SCUBA divers from 2009-2016 indicate lionfish are widespread throughout Alabama's artificial reef permit zone. AMRD received a grant from the Gulf States Marine Fisheries Commission (GSMFC) in December 2012 to monitor reef communities in the Gulf of Mexico. Dispatch red lionfish when encountered during SCUBA surveys, increase public awareness of the lionfish invasion, and streamline the general coordination between state and federal agencies, and the public. Additional funding was secured from GSMFC to continue the monitoring and continue increasing public awareness.

Other invasive species documented in Alabama coastal waters include the Bocourt swimming crab, tessellated blenny, Australian spotted jellyfish, Asian green mussel, and red lionfish.

Florida

Sommers reported that the FWC Lionfish Team recently began a new teen program called "Lionfish: Classroom Invasion". The primary focus of this program is to offer lionfish dissections at local high schools. The FWC will continue to develop the program. The students enjoy getting to see what is in a lionfish stomach, and it introduces them to the severity of the invasion.

The FWC Lionfish Team hosted the third annual FL Lionfish Derby workshop in October 2016. The event gathers feedback on FWC involvement in lionfish tournaments from stakeholders involved in lionfish derby organization, helps facilitate communication among members of the lionfish community, and discusses new ideas for management and education.

On May 20-21, 2017, the FWC will host the 2017 Lionfish Removal and Awareness Day, with a two-day festival in Pensacola. Six other events are scheduled to take place on the same weekend at locations around the state.

The FWC has undertaken a more proactive approach to the lionfish problem by executing a contract with the University of Florida to evaluate, test, and modify a risk-screening tool, the Aquatic Species Invasiveness Screening Kit (AS-ISK), which can be used to identify potential marine invaders in Florida. The primary goal of the study is to evaluate the risk of invasion of lionfish in the genera *Dendrochirus*, *Parapterois*, *Pterois*. The objectives of the two-year proposal are to produce a biological synopsis for the three species, evaluate and test the AS-ISK, and apply the AS-ISK to the three species.
Three non-native molluscs, the orange cup coral, the giant foam oyster, and the vermitid worm-snail have recently been discovered on intentionally-sunken ships in the Florida Keys. Vermitids are potentially harmful to hard coral growth and survival, and act as intermediate hosts for blood flukes that parasitize loggerhead turtles. Orange cup coral are successful space competitors possessing allelopathic qualities to out-compete potential space competitors. This trait, along with high fecundity, enhances their invasive potential. It is unknown if harvesting may be an effective way to reduce the abundance of orange cup coral, or if these activities may exacerbate the spread of orange cup coral into natural habitats. To address this concern, the FWC's Fish and Wildlife Research Institute has partnered with the FWC's Wildlife Impact Management Section (WIM) to undertake several manipulative field and laboratory studies to evaluate the competitive interactions between orange cup coral and two native reef-building corals, staghorn coral, and lesser starlet coral. The FWC's WIM Section has also begun contract negotiations with the University of Central Florida to conduct genetic analyses on the orange cup coral. The results of these studies will be used to develop a management recommendation regarding the directed commercial harvest of orange cup coral.

The FWC and the USFWS have partnered with Fishbrain AB, the world's largest free-to-use app and social network for anglers to collect information on non-native freshwater fish. The FWC provided a list and pictures of 15 non-native freshwater fish of interest to the company, and Fishbrain app users now have the information required to record these non-native species when they catch them. They can also log catches by recording the location, time species, and a picture of their catch. The FWC will use this information to help determine the distribution of established non-native fish, and if a new species is discovered, implement management strategies to eradicate or minimize its potential impacts. Florida is the pilot state to test this tool. To date, over 1,600 non-native fish reports have been received.

Two FWC/USGS-sponsored non-native Fish Slams were held during 2016-2017. Teams from multiple agencies and universities sampled waterbodies not frequented by biologists to document the non-native fish fauna. In November 2016, 10 teams sampled 21 locations in Miami-Dade and Palm Beach counties. A total of 20 non-native freshwater fish species were collected, but no new species were documented during the efforts. In March 2017, eight teams sampled 28 locations within the Big Cypress National Preserve in Collier County. A total of 13 non-native fish species were collected. No new species were collected, but range expansions were documented for Nile tilapia and brown hoplo.

New Guinea flatworms have recently been discovered in parts of south Florida. A variety of land snails comprise a part of their diet, which could impact populations of Florida's native snails. These flatworms can also host at least two species of nematodes that can cause serious diseases in humans and other mammals. To address these concerns, the FWC has executed a contract with researchers at Florida International University that will determine distribution, presence/prevalence, predation effects, how the flatworms are dispersing, and to propose methods to limit their spread.

The 8th Annual ECISMA Non-native Fish Roundup will be held in April 2017. The FWC/USGS Non-native Fish Slam will be held in November 2017. The first Snakehead Roundup of the 2017 season will be held in April 2017. Monthly tournaments will be held through September.
Phillips reported that managers spent approximately $4.38 million controlling 34,104 acres of floating invasive plants in Florida public lakes and rivers during FY 2015-2016. Of the 197 hydrilla population reported in 2016, 147 covered 10 acres or less, signifying that most are under maintenance control or have met target goals and are at very low levels. Populations exceeding 100 acres are the higher management priorities for 2017. When funds are sufficient, hydrilla can be managed at a low level.

Georgia

Bonvechio reported that over 7,000 flathead were removed from the Satilla River during the current 2016 sampling season. The size structure has declined, with the average-size fish removed progressively dropping from 5.8 pounds in 2007, to 0.8 pounds in 2013. The average-size fish captured in 2016 was 2.6 pounds. Suppression of the flathead catfish population in the Satilla River has been demonstrated through measured changes in biomass, size, and age-structure. However, higher recruitment and earlier maturation is being witnessed. Ongoing harvest will be required to prevent the flathead population from rebuilding.

There was a recruitment explosion of blue catfish in the Satilla River in 2016. Their range has also expanded. This increase in observed blue catfish concerns resource managers, and continued monitoring and removal will occur.

Asian carp continue to move up the Tennessee River system in Alabama. There are many potential vectors for the spread of Asian carp into Georgia waters. The most likely of these appears to be inter-basin transfer via angler bait bucket. Movement up the Tennessee River system in Alabama is continually monitored, and personnel actively participate on the Ohio River Asian Carp Planning Team.

Giant salvinia is one of the top species of concern in the Georgia Aquatic Nuisance Species Management Plan. The GADNR has been proactive in the management and control of this invasive species.

There have been two reports in the last few years of yellow perch – one in May 2016 in the Oconee River, and another in November 2016 in the Altamaha River.

In October 2016, a 10-inch brown haplo was caught in the Flint River near Albany. This was most likely an aquarium-released fish. They are well-established in a large part of Florida. This is the first documented case of these fish being found in the wild in Georgia.

A flathead catfish was caught in the Bartlett's Ferry Reservoir in November 2016. This is the first known occurrence in this waterbody.

The GADNR WRD website was revamped in the fall of 2016. Major aquatic nuisance species and potential future threats were summarized. Also addressed were major diseases and epidemics with neighboring state trout populations, aquatic vegetation issues, and other non-game invasives.

Louisiana

Asian Carp continue to be a problem in Louisiana's big rivers. They continue to slowly spread into smaller coastal river drainages. Research continues on the impacts the carp may have on native fishes, and LDWF is continuing to monitor the status and spread of these species in state waters.

During 2016, the LA DWF received over 300 calls reporting applesnail infestations. Because of mild winters, it appears they will continue to spread more rapidly and distant in 2017. Extreme flooding in SE Louisiana during August 2016 provided excellent expansion conditions. They have now been observed in 23 of the state's 64 parishes. Entire sections of freshwater marsh are being reported as "eaten out" in some of the coastal parishes. Waterfowl hunters and fur trappers are reporting significant declines in ducks and fur bearers on their leased/owned lands where applesnail infestations are severe.

In 2016, LDWF received 21 reports of Tiger Shrimp from commercial and recreational fishermen along the LA coastline, from the Texas state line to the Mississippi River. These sightings were in nearshore/bay areas during the months of August and September.

From 2012-2015, LDWF dive teams performed 52 roving diver lionfish surveys at three standing platforms during summer months. Lionfish were sighted during 63% of all dives. During 2016, several reports of recreational hook-and-line catches were received by LDWF.

During 2016, aquatic plant control plans were developed for 73 different waterbodies. Giant salvinia continues to be the most problematic AIS plant in LA. Since 2008, LDWF has treated an average of 20,000 acres of giant salvinia per year with herbicides.

Mississippi

In Robinson Bayou in the Pascagoula River, 111 giant applesnail egg masses were destroyed, and two live snails removed. No applesnail eggs were found after October 24, 2016, through the reporting period. Presumably, the snails survive the cooler months by burrowing into the sediment and remaining dormant until warmer weather returns.

Two aerial surveys totaling 182 miles were conducted for early detection of aquatic invasive species, and monitoring of existing infestations. Also, 38 boat surveys were done totaling 413 miles.

Salvinia weevils and spot herbicide applications were used to treat existing populations of common salvinia and giant salvinia.

For an upcoming lionfish event, 132 lionfish outreach t-shirts for the Mississippi Aquatic Invasive Species Council were produced.

Riecke provided the freshwater report. A fishing regulation rule was passed that requires that live bait captured in reservoir spillways be immediately placed on ice or in a dry container to prevent bait bucket transfers of Asian carp from spillways to reservoirs.

Chemical treatment was done on hundreds of acres for numerous aquatic invasive species.

The second meeting of the Mississippi Aquatic Invasive Species Council was held in March 2017 to guide implementation of the activities specified in the *Mississippi State Management Plan for Aquatic Invasive Species*.

Special Harvest Permits were issued to Moon River Foods for the use of special gear for the harvest of Silver Carp and Bighead Carp. In 2016, Moon River Foods harvested over 59,000 pounds of Bighead Carp, over 712,000 pounds of Silver Carp, over 39,000 pounds of Grass Carp, and over 95,000 pounds of Common Carp. However, in February 2017, two Moon River fishermen drowned in rough weather conditions on Moon Lake, and Moon River Foods ceased operations in February 2017.

A final report was completed and submitted to the USFWS on a project to capture Asian Carp in the Tennessee-Tombigbee Waterway (TTW) to implant them with radio transmitters. Three sonic tag receivers were deployed and removed in the TTW. No Silver Carp or Bighead Carp were netted.

Stage-One pre-proposals to use FY2016 and FY2017 ANS grant funding were submitted to the USFWS.

MDWFP purchased 15,000 Asian Watch ID cards for distribution to MDWFP State Fishing Lake, state parks, and the District Office.

Four Black Carp were found in the Mississippi River near Greenville. They were sent to the USGS for ploidy determination, and reported to the ANS database.

The “Stop Aquatic Hitchhikers”cards continue to be printed and distributed along with all boat registrations or renewals that are mailed out.

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

Freshwater fishing bait regulations to specify what bait can be legally sold, possessed, transported, and used in Mississippi will be formed.

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

North Carolina

Flora reported that in 2016, 12 tiger shrimp were reported – seven were confirmed by photographs.

Flathead catfish appear to be moving upstream in several watersheds in the Tar River and Neuse River basins, and are the likely cause for the decline of Carolina Madtoms. The USFWS Sportfish Restoration Grant has funded a non-native catfish project in the Cape Fear which will begin in 2017. This study will look at habitat and prey selection of flathead catfish.

Since September 2013, 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. Anglers have been asked to report observations of gill lice during recreational outings, and the NC WRC will continue to sample Brook Trout and Rainbow Trout populations across the mountains of North Carolina to document the distribution and status of gill lice.
In July 2015, whirling disease was confirmed in Rainbow Trout collected from the Watauga River. It was the first occurrence of the disease in NC. Additional testing has identified the disease within the Elk River. In addition, the NC WRC collected *Tubifex tubifex* (the worm host of the parasite) from its Delayed Harvest Trout Waters to test for the presence of *Myxobolus cerebralis* (the parasite that causes whirling disease). *T. tubifex* from Mill Creek and Watauga River were found to be positive. In addition, infected *T. tubifex* were collected above NC WRC's Marion State Fish Hatchery. In spring 2016, the NC WRC initiated testing of slef-sustaining wild trout populations in spring 2016 for the presence of *Myxobolus cerebralis* and whirling disease. The effort focused on collecting samples across a wide spatial extent, and approximately 1,500 trout from 36 locations were examined.

Cells of the microscopic algae *Didymosphenia geminata* (Didymo) were collected in the Tuckasegee River by researchers from Tennessee Tech University. This is the first time the organism has been documented in North Carolina. Additional research is needed to determine its prevalence in the Tuckasegee River and throughout the state.

Lionfish continue to thrive off the NC coast. NOAA is working to address lionfish ecological impacts, control strategies, and various commercial harvesting methods.

Herbicide treatments have been done on numerous lakes and rivers throughout the state. Albemarie-Pamlico National Estuary Partnership (APNEP) formed a Hydrilla Technical Advisory Group. The group drafted an action plan on how to monitor and manage hydrilla. Signs

have been posted at boat ramps to educate boaters and other users on stopping the spread of aquatic invasive species. In 2016 there were funding problems for the group.

For 2016-2017 funding, state legislation was amended to resolve previous limitation set on state aquatic weed funds in 2015-2016 of "waters of the state located within lakes:". The current fiscal year budget now allows operations in all "waters of the state".

Blue Catfish have recently become a topic of concern again in certain parts of NC. Their range has been expanding over the years, and commercial landings are increasing.

The NC Aquatic Nuisance Species Management Plan was drafted in 2014-2015. The Plan was signed by NC Department of Environmental Quality, NC Wildlife Resources Commission, and NC Department of Agriculture in February 2016. At the time, there was no plan for submission to the national ANS Task Force for review and approval. With a new administration, conversation has been renewed on the status of the ANS Plan.

South Carolina

Kingsley-Smith reported that researchers at the SC Department of Natural Resources Marine Resources Research Institute remain interested in improving their understanding of the invasion of the South Atlantic Bight and Gulf of Mexico by the Asian tiger shrimp. Reports and concern over tiger shrimp among the general public have declined in recent years.

From May 2015 to April 2016, three surveys for Island Applesnails were conducted on numerous ponds to determine the distribution of the species, assess the extent of the localized populations, and observe growth and abundance patterns of an established population.

A large population of charrua mussel was discovered in 2006 in Liberty County, Georgia, near Savannah. Until recently, few living charrua mussels had been found in SC. In 2008, large numbers of shell valves from recently dead mussels were found in the hull scrapings from the bottom of a large barge that was engaged in interstate transport between Jacksonville, FL and Norfolk, VA. Thousands of adult charrua mussel valves, as well as invasive *P. viridis*, were found on the ground following routine hull maintenance at a shipyard on Yonges Island, SC. During the first two weeks of September 2016, owners of hull cleaning services in Charleston reported that they have seen substantial aggregations of charrua mussels on recreational boats docked at four different marinas in Charleston. A preliminary study was conducted to determine the current distribution and densities of *M. charruana* in South Carolina. Floating docks at 10 marinas located along the SC coast were surveyed. *Mytella charruana* was observed at 3 of the 10 marinas. The broad size range of the mussels collected suggests that they are successfully reproducing at these locations.

Texas

McGarrity reported that the 84th Legislature provided TPWD with $6.3 million for statewide management of aquatic invasive species, an increase from $1.1 million in the previous biennium. TPWD and their partners have stepped up the war on aquatic invasive species in fiscal years 2016-2017. To coordinate and ensure effective use of available resources, TPWD established an Aquatic Invasive Species Working Group in fall 2015. This working group has built and

expanded existing partnerships with universities, river authorities, municipal water districts, non-profits, local, state, and federal agencies, and other partners. Between fall 2015 and winter 2016, these partnerships planned and delivered over 60 aquatic invasive species management projects statewide. Current funding will allow these projects to continue through fall 2017.

TPWD biologists successfully contained and managed new introductions of giant salvinia at Lake Fork, Falcon Lake, Brandy Branch Reservoir, and Martin Creek Reservoir. Localized eradication of giant salvinia was also achieved at Brandy Branch and Martin Creek reservoirs through early detection, mechanical removal, and continued routine monitoring. TPWD reared 420,000 giant salvinia weevils, a natural biocontrol for giant salvinia, at greenhouses in Jasper and Brookeland. The majority of the weevils were released into Toledo Bend Reservoir, Sam Rayburn Reservoir, and Caddo Lake. Giant salvinia weevils were also used in a successful control project at Cow Bayou. Since increased funding became available in fall 2015, TPWD and partners have conducted large-scale treatment of 17,294 acres of numerous lakes.

In the Nueces River watershed, ongoing control efforts of Arundo by the Nueces River Authority have been highly successful. Over the past seven years, 202 riverside landowners have joined forces to treat approximately 300 acres of Arundo along 90 miles of river. In 2016, TPWD contributed to continued monitoring and treatment of Arundo. Arundo has now been trated along six miles of Barons Creek. Along the Blanco River, TPWD partnered with The Nature Conservancy, Lady Bird Johnson Wildflower Center, and 67 cooperating riverside landowners to manage Arundo and restore native streamside plants.

Along the Upper Brazos River, saltcedar is being managed in the headwater region. In 2016, a total of 3,500 acres of saltcedar was treated using targeted, aerial application of aquatic herbicides. Treatment efforts will continue downstream. Along 25 miles of the Llano River and its tributaries, three elephant ear treatments were done in 2016. In areas where elephant ear has been effectively managed, native vegetation communities have quickly rebounded. TPWD partnered with Texas A&M University to evaluate the benefits of native aquatic plant enhancement in Lake Conroe. Natives are being planted in East Texas lakes by TPWD and partners as an aquatic invasive species management strategy.

Artificial wetland cells have been constructed to examine whether native aquatic plants could be established by continuous dispersal of plant seed from wetland cells to a lake. The initial trial will begin at a cove on Lake Fork, in partnership with the Sabine River Authority. Thousands of floating seeds will flow from the cells back to the lake, eventually settling out to germinate, grow into adult plants, and establish viable communities.

Stephen F. Austin State University recently isolated chemical compounds from giant salvinia that are toxic to the plants themselves in concentrated doses. Dubbed “endocides”, these compounds appear highly selective in early trials, killing only giant salvinia. Field trials are currently underway.

TPWD is partnering with Texas Tech University to conduct a project to study where invasive Asian carp are present, and where they might be able to thrive. Teams conducted electrofishing

surveys at different sites on the Red, Sulphur, and Sabine Rivers and Big Cypress Bayou. No invasive carp were found.

TPWD has partnered with Texas Tech University to conduct a comprehensive review of all available scientific information available for tilapia and identify critical knowledge gaps. Researchers will assess whether any of Texas imperiled native fishes could be negatively affected by tilapia, and, if so, what geographic areas would be of eh greatest concern. This study is underway, with results of the literature review expected by mid-April 2017.

For the past several years, TPWD has cooperated with SWCA Environmental Consultants and Texas A&M University to study the biology of armored catfish in the Comal River and Landa Lake. In 2016, 126 armored catfish were collected from these systems to study their reproduction and growth.

TPWD partnered with the University of Texas at Arlington to monitor zebra mussel growth, reproduction, and establishment of young mussels in lakes Texoma, Ray Roberts, Lewisville, Belton, and Eagle Mountain. This is a study of the long-term prospects for zebra mussels in these lakes. Downstream dispersal from infested lakes is also a big concern in Texas, and TPWD partnered with Texas Tech University and Texas State University to conduct the first ever Texas-specific zebra mussel assessments to determine which Texas lakes are at the greatest risk of invasion, and how far they are likely to spread downstream. The Texas Tech University study will use cutting-edge "eDNA" (environmental DNA) technology to test how far downstream zebra mussel DNA can be detected. Full results of the studies are expected by fall 2017.

A public awareness campaign targeting boaters in East Texas was created and implemented from June through August 2016. Outdoor advertising was placed along major thoroughfares to and from East Texas lakes where giant salvinia is present and poses the highest risk for being spread to new water bodies. A new web page was developed, with animated "Lake Dudes" characters that use humor and peer pressure to break through to new audiences in a radio ad and a series of five short digital videos.

From Memorial Day through Labor Day, two teams of seasonal technicians inspected boats or exotic species, increased awareness among boaters at numerous lakes, and coordinated with the marinas that serve as "lake gatekeepers". Approximately 1,960 boats were inspected, and no infested boats were found.

McMahon reported that they are working on a grant from TPWD to look at zebra mussel population dynamics in the three most-infested lakes in Texas.

HARC

Gonzalez reported that they are over half-way through a grant from TPWD to complete an update for the invasive species field guide that was done several years ago for the upper Texas coast. The update will be completed by August 2017. The field guides will be printed as small pocket guides.

USACE

Lane reported that they have created a nation-wide traveling trunk program. There are 10 trunks available that are regional.

They are continuing chemical grass trials in Florida, and hope that the chemicals can be registered by the EPA, and used on invasive grasses in aquatic areas. They also are conducting effectiveness and cost comparison experiments using generic versus name-brand chemicals.

REEF

Akins reported that they conducted an early detection/rapid response effort for a diver's report of a species of rabbitfish - the blotched foxface. This is the first report in U.S. waters. They captured the fish less than 24 hours after the report was received. After being quarantined, the fish was donated to the Frost Museum of Science, where it is now on display with signage about invasive species.

A lab study was done on sound production in lionfish that documented their ability to produce a deep "strumming" sound through vibration of the swim bladder. It is hoped that more studies will be done to determine when and why they utilize this sound, and if this can possibly be used against them to make them easier to capture.

The lionfish-sighting iPhone app that was funded through USFWS is now "live". It is not state-specific. Sighting reports are displayed for 30 days, so divers can use the reports to target lionfish removals.

Discussion of ANSTF Recommendations

A Motion was made to wait until the next GSARP meeting to discuss recommendations. A Motion was made to accept the Recommendation. The Motion was seconded, and passed.

Other Business

Next Meeting Time and Place

The possible locations of the next meeting in North Carolina will be either Asheville, Charlotte, or Raleigh.

The date will be decided on in the near future.

Public Comment

Kristen 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 2:30 p.m.