

**GULF & SOUTH ATLANTIC REGIONAL PANEL
ON AQUATIC INVASIVE SPECIES
MINUTES**

Tuesday, November 19, 2019 – Wednesday, November 20, 2019

Charleston, SC

On Tuesday, November 19, 2019, Chairman **Lisa Gonzalez** 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

Kristina Alexander, MS-AL SGC, Oxford, MS
James Ballard, GSMFC, Ocean Springs, MS
Rob Bourgeois, LDWF, Baton Rouge, LA
Wesley Daniel, USGS, Gainesville, FL
Rob Emens, NC DEQ, Raleigh, NC
Corrin Flora, NC DMF, Elizabeth City, NC
Pam Fuller, At-Large Member, High Springs, 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 NEP, Palatka, FL (via conference call)
Peter Kingsley-Smith, SC DNR, Charleston, SC
David Knott, At-Large Member, Charleston, SC
Jon Lane, USACE, Jacksonville, FL
Monica McGarrity, TPWD, Austin, TX
Robert McMahon, UT Arlington, Arlington, TX
Craig Newton, AL DCNR, Dauphin Island, AL
Chris Page, SC DNR, West Columbia, SC
Jim Page, GA DNR, Waycross, GA
Michael Pursley, MS DMR, Biloxi, MS
Matt Phillips, FWC, Tallahassee, FL
Dennis Riecke, MDWFP, Jackson, MS
Anna Toline, NPS, Charleston, SC
Craig van der Heiden, Miccosukee Tribe of Indians, Miami, FL
Cindy Williams, USFWS, Atlanta, GA

Staff

Ali Wilhelm, GSMFC, Ocean Springs, MS
Joe Ferrer, GSMFC, Ocean Springs, MS

Others

Chelsea Bohaty, USACE, Jacksonville, FL
Elizabeth Brown, Denver, CO (GoToMeeting)
Jeff Brunson, SC DNR, Charleston, SC
Tanya Darden, SC DNR, Charleston, SC
Joseph Evans, SC DNR, Charleston, SC
Daniel Farrae, SC DNR, Charleston, SC
Margaret Finch, SC DNR, Charleston, SC

Kelly Gestring, FWCC, Davie, FL
Elizabeth Gooding, SC DNR, Charleston, SC
Julie Holling, SC DNR, West Columbia, SC
Jeanette Huber, SC DNR, Charleston, SC
Steve Johnson, Univ. of FL, Gainesville, FL
Michael Kendrick, SC DNR, Charleston, SC
Cayla Morningstar, USGS, Gainesville, FL
Susan Pasko, USFWS, Falls Church, VA (via conference call)
Mark Scott, SC DNR, Clemson, SC
Ken Rentiers, SCDNR, West Columbia, SC
Austen Thomas, Smith-Root, Vancouver, Washington
Aaron Watson, SCDNR, Charleston, SC
James Whalen, USDA, Columbia, SC

Public Comment

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

Adoption of Agenda

A motion to adopt the agenda was made, and passed unanimously.

Approval of Minutes

The minutes of the April 17-18, 2019 GSARP meeting in Ft. Lauderdale, FL were presented for approval.

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

Welcome, history, and overview from the SC DNR ANS Program

Ken Rentiers gave a PowerPoint presentation entitled “South Carolina Aquatic Nuisance Species Program”. The South Carolina Aquatic Nuisance Species Program was established by Executive Order in 1980, then by law in 1990. The purpose of the program is to prevent and control the introduction, spread, and impact of aquatic invasive species in SC’s public waters, and to improve habitat, and minimize the problematic impacts to water use caused by invasive species through management and prevention efforts. The program is administered by the Department of Natural Resources and the Aquatic Plant Management Council. Early funding was primarily from the USACOE Established Aquatic Plant Management Trust Fund. Recent funding for the Trust Fund has been established from SC’s Water Recreation Resource funds. The Aquatic Plant Management Council has 10 members on its board. It serves as the principal advisory body to the DNR on all aspects of aquatic plant management and research. It establishes management policy and approves all management plans. DNR has approval authority for sections that do not receive two-thirds approval by the Council.

The South Carolina Invasive Species Advisory Committee is a newly-formed committee established by statutory regulation, and is tasked with reviewing requests from state agencies, industry stakeholders, agricultural and environmental representatives, and concerned citizens to make recommendations for additions or deletions to the official list of regulated plant pests in the state, including both terrestrial and aquatics.

The goals of the program are to increase the coordination of aquatic invasive species activities, monitor occurrence and spread of aquatic invasive species, and provide habitat enhancement by eradicating newly-discovered and established invasive species, manage aquatic invasive species when eradication is not possible, identify and implement needed research on impacts and control of aquatic invasive species, educate public and private stakeholders on the impacts of aquatic invasive species, and how they can assist in preventing introductions and minimizing harm, strengthen legislative and regulatory authority, and secure long-term funding for AIS activities.

Update on SC DNR freshwater ANS priorities and emerging concerns

Chris Page reported on *Salvinia molesta* in Lake Marion. From 1991 – 1996, 2,684 acres of the lake were treated per year. Since 1996 when control by grass carp was evident, they only averaged <50 acres a year, with the majority of the work done in impoundments off of the lake.

Hydrilla has been significantly controlled through an integrated management approach using herbicide and biological control methods. From 1982 – 2007, over 50,000 acres have been treated with herbicides. Triploid grass carp stockings have drastically reduced the herbicide treatment of hydrilla in SC's major lakes. Grass carp have been stocked in Lake Greenwood, Lake Murray, Santee Cooper, Goose Creek Reservoir. Other lakes include: Lake Bowen, Lake Croft, Lake Keowee, Lake Prestwood, Lake Wylie, Lake York, and others.

From 1991 – Present, over 32,000 acres have been treated for water hyacinth. Control efforts continue. Most hyacinth work around coastal SC is done by airboats because of the large expanses it covers in most coastal rivers, streams, and impoundments. With a reduction in acreage of hydrilla and phragmites, hyacinth remains the largest problem in SC waters.

Since 2003 when *Phragmites australis* control was first initiated in small test plots, a total of 19,706 acres were treated when monies were available. It was cyclic in nature, with little maintenance work done in the interim periods, due to manpower and dollar shortages. Many areas were controlled redundantly every five years. In recent years with increased wildlife program funding, maintenance control has been effective. Most phragmites work around coastal South Carolina is done by helicopter because of the large expanses it covers in relatively undeveloped areas. In the Santee Coastal Reserve, over 15,000 acres of phragmites were treated. Because of phragmites, 22.25% of total managed impoundments are unusable by waterfowl.

Rapid Response Protocol is a very informal network that consists of Clemson University Cooperative Extension Service agents, SC Department of Natural Resources field personnel, and public reports. Responders are from the SC DNR aquatic Nuisance Species Program. In Colleton County and Jasper County, rapid response action resulted in the early detection and eradication of *Salvinia molesta*.

In March 2020, the 2020 South Carolina Aquatic Plant Management Plan will be available online. Proposed control operations and expenditures include determining waterbodies and areas to be managed. Budgets will also be determined. State park lakes will be included. Phragmites control will be continued.

Recent research into invasive crayfish of the Carolinas

Michael Kendrick gave a PowerPoint presentation entitled “Recent Research into Invasive Crayfishes of the Carolinas”. There are 40 species of crayfish in South Carolina. Non-native crayfish impacts include the potential for hybridization, and disease vectors.

Native crayfish transplant threats to South Carolina include rusty crayfish (*Faxonius rusticus*), virile crayfish (*Faxonius virilis*), and red swamp crayfish (*Procambarus clarkii*). Virile crayfish were introduced as bait and intentional stocking for forage. Rusty crayfish out-compete and displace native crayfish, and reduce resources. They were introduced as bait and school pets. Red swamp crayfish were introduced as releases from aquaculture, the aquarium trade, and schools. They outcompete native animals, reduce macrophyte density, are vectors for spreading parasites and other species, and are an agricultural and infrastructure pest.

Currently, SIANSMP is funding projects researching the potential hybridization with native crayfish, and disease vectors for crayfish and other crustaceans. The white spot syndrome virus is highly pathogenic, and infects a range of crustaceans, including white shrimp and blue crab. The virus is found in wild and farmed *P. clarkii* in Louisiana. SC DNR is testing *P. clarkii* near brackish water for the virus. If present, it represents a significant threat to shrimp and blue crab.

Many crayfish hybridize, but little is known about the process in the genus *Procambarus*, and whether *P. clarkii* hybridizes with native *P. troglodytes*. SC DNR’s genetic section is developing microsatellite markers to test for hybridization. The next steps for understanding non-native crayfish in the Carolinas are to improve understanding of dispersal events, and to better understand impacts of non-native crayfish on natural environments.

Update on island apple snail research in South Carolina

Elizabeth Gooding gave a PowerPoint presentation entitled “Update on Island Apple Snail Research in South Carolina”. Island apple snails were introduced to the U.S. via the aquarium trade. They were first introduced to the U.S. in Florida in 2002. They were first reported in South Carolina in 2008. They are typically found in stormwater retention ponds, of which there are over 14,000 in SC coastal counties. The spread of snails is through flooding, large rain events, pond connectivity, and by predators. The snails reproduce year-round. Egg clutches contain approximately 2,000 eggs, yielding 10-140 snails, which mature at approximately 4-5 months. The snails consume a wide variety of aquatic vegetation., and have higher rates of feeding and growth than most native freshwater snails. They cause shifts from macrophyte to algal based systems, and are agricultural pests on rice and taro in Asia.

The rat lungworm *Angiostrongylus cantonensis* is a nematode parasite that can cause potentially fatal eosinophilic meningitis in humans through handling and/or consumption of island apple snails. Island apple snails have been identified as an intermediate host for *A. cantonensis* in several locations in Louisiana. No studies to date have detected the prevalence of this parasite in island apple snails in South Carolina.

A project is under way to determine the extent of the island apple snail invasion in West Ashley, SC. Pond perimeters are being surveyed; egg clutches, single apple snails, and copulating pairs are counted; water quality is being surveyed; specific locations of island apple snails in more natural environments are being documented.

Future survey plans include: Continue expanding survey efforts to be on the lookout for further spread; EDRR; re-survey Village Green neighborhood retention ponds in the spring/summer of 2020; decide how new areas to be surveyed are determined.

Development and validation of a qPCR tool for the environmental detection of *Anguillicoloides crassus*, an invasive parasite in the American eel

Aaron Watson gave a PowerPoint presentation entitled “Development and Validation of a qPCR Tool for the Environmental Detection of *Anguillicoloides crassus*, an Invasive Parasite in the American Eel”. *Anguillicoloides crassus* was introduced to Europe from Taiwan in the 1980s. The first detection in wild American eels was in 1995 in Winyah Bay, SC. In 2015, there were reports throughout the American eel range, with approximately 50% infection in SC in both yellow and glass eels. Distribution was driven by long-range jumps along existing trading routes of live eels.

There are negative impacts on American eel survival, such as anemia, swim bladder damage, and high mortality rates under stressful environmental conditions. Sub-lethal effects include the reduction of survival in aquaculture, fitness reduction, and potential for survival. In the swim bladder function, there is decreased survival in stressful conditions due to lesions and tunnel formations in the swim bladder from migrating larvae, epithelial lesions from bloodsucking adults, and degeneration and inflammation of the swim bladder wall.

The primary method of *A. crassus* identification is lethal, i.e., by dissection. There are objectives of developing a species-specific primer and probe for the detection of *A. crassus*, and to apply it to a field setting – Design an efficient compatible primer and probe set to test specificity of primer and probe; test the limitations in known L2 and L3 life stages; validate tool against synthetic DNA; apply in a field setting to optimize sampling protocol and test for inhibition. Primer and probe pairs were tested from a species-specific sequence within the COI region. Primers were tested for self-complementarity, and similarities identified with closely related species. Nematode species belonging to the closely-related family Philometridae were collected from various fish species, and also tissue from American eel. No amplification from non-*A. crassus* samples was detected, supporting the premise that this tool is species-specific. Can the life stage present be differentiated based on DNA concentration? One L2 and one L3 can be detected. One parasite can be detected of either life stage. There is inhibition potential. Chemicals which inhibit PCR are common in environmental samples. DNA extraction and isolation methods are designed to remove most impurities. Tannic and humic acids persist in the final DNA isolation.

In summary, this assay is efficient, species-specific, and unaffected by inhibition based on preliminary field samples collected in the Goose Creek Reservoir area. The use of assay with field collections was validated, with positive detection for the plankton sample. Copepods are known intermediate hosts. There was 100% detection with 2mL of plankton. There was a potential for false negative among non-plankton field samples. The appropriate volume for these samples may not be cost-effective for this method.

Future work and management implications include the future application of the assay to aquaculture and stock assessment practices. The aquaculture industry can reduce the import of infected eels. Natural resource managers could limit the transfer of eels to mitigate the spread of the invasive species. Numerous American eel elvers could be sampled at once, rather than

dissecting individuals. Temporal and spatial distribution of *A. crassus* in the southeastern US could be assessed, a non-invasive way to identify if *A. crassus* is present in an area.

Introgressive hybridization with an invasive species imperils the Savannah River endemic Bartram's Redeye Bass

Mark Scott gave a PowerPoint presentation entitled "Introgressive Hybridization with an Invasive Species Imperils the Savannah River Endemic Bartram's Redeye Bass. In 1940, all 'upland' species were redeye bass. Original "Redeye Bass" represents three to eight separate bass species. True "Redeye Bass" inhabits the upper Mobile Basin. Separate species include: Chattahoochee Bass, Altamaha Bass, and Bartram's Bass.

In the mid 1908s, Alabama bass were illegally introduced by anglers into Savannah River reservoirs. By the end of the 1990s, biologists were arguing over bass IDs due to hybridization and mixed phenotypes. By 2004 when fish samples were genotyped, hybrids already made up a significant portion of most reservoirs. By 2010, few pure Bartram's bass remained. Bartram's alleles were purged from the system via introgression. Endemic fish are facing the potential for extinction before being formally described. Prior findings have since showed a steady introgression with Bartram's bass (genetic swamping). Alabama bass now appear to be dominating lakes. Work in tributaries showed the scattered presence of Alabama bass and hybrids. The focus on running waters will look at the spatial and anthropogenic disturbance factors associated with pure Bartram's bass populations, if hybridization is occurring in flowing waters, and if they are invading tributary rivers and streams - also, to what extent they and hybrids are distributed throughout the upper Savannah drainage.

In the Upper Savannah River Basin, longitudinal surveys were done in 2013-2015. Hybridization was detected, and refugia was identified. Distance from reservoir was a factor. In 2017-2018, fish were collected by backpack electrofishing and angling at 160 sites on tributaries. All black bass were photographed and fins clipped. Nesting sites were monitored, and eggs and larvae sampled for DNA. Microsatellite DNA analysis was based on previous work. Catchment data for sites were clipped from NFHA.

Alabama bass or hybrids are present in a significant number of tributary sites. There are documented tributary sub-basins and zones of pure BTB populations. Baselines were established of the extent of Alabama bass invasion for trend monitoring. Young hybrids were collected at some upstream sites; it is likely that hybridization is occurring in flowing systems rather than migration up from impoundments. The proportion of Alabama bass at a site was related to spatial and anthropogenic factors - hypotheses include: disturbed habitats may stress fish, affect spawning cues, or may simply be more suitable for Alabama bass.

For conservation of Bartram's bass, target levels need to be established necessary to sustain Bartram's bass populations if catchment disturbance relationships are confirmed. Preliminary targets are: catchment riparian forests, agricultural land use, and impervious surfaces. Additional data should be used to re-evaluate. The next steps are to do occupancy modeling for Bartram's bass in the upper Savannah basin based on spatial and geographic predictors and instream habitat suitability; describe the species; do mapping of areas of potential Bartram's bass refugia that meet target disturbance levels; track the extent of Alabama bass longitudinal invasion up tributaries as baseline information to compare future spatial distribution; investigate the potential for Bartram's bass culture and conservation stocking at suitable locations.

Is the lionfish invasion coming to an end? A case study from the Southeast United States

Margaret Finch gave a PowerPoint presentation entitled “Is the Lionfish Invasion Coming to an End? A Case Study from the Southeast United States”. The objectives of the case study were to describe the distribution and abundance of lionfish off the southeast US coast over a broad spatial and temporal scale; determine the environmental conditions that affect the distribution and abundance of lionfish; provide insight on how the lionfish invasion has changed through time. The Southeast Reef Fish Survey is a long-term fisheries independent monitoring program that includes MARMAP, SEAMAP-South Atlantic, and SEFIS.

Data consisted of the sampling location, depth, day of year and year, and bottom temperature. Since 2011, video cameras have been included on all traps. Twenty minutes of video is recorded. Also collected are habitat/water quality data – biota density and height, substrate relief and size, water clarity, and how many lionfish are present. Modeling methods were two-part: Distribution (where are the lionfish) and abundance (how many lionfish were present). Input parameters were: year, day of year, clarity, current, bottom type, depth, latitude, temperature, and biota density. Model accuracy averages were: Model accuracy – 85%; false positive rate – 2%; False negative rate – 13%. Lionfish prefer hard bottom habitats in deeper water. Outer shelf species are more susceptible to impacts from lionfish. This was the first large-scale study of lionfish abundance and distribution in this region. Conclusions from the case study showed that lionfish occurrence and abundance increased until 2015, but has since stabilized. Future range expansion is possible with increasing water temperatures and lionfish preference for deeper water. Therefore, fisheries managers and scientists need to continue monitoring the lionfish invasion.

Overview of boat inspection and decontamination programs

Elizabeth Brown (GoToMeeting) stated that the first population of quagga mussels was discovered in Lake Mead in January 2007. Quagga and zebra mussels (often referred to as Dreissenids) are native to the Black and Caspian Sea drainages. Dreissenid mussels were introduced to the Great Lakes region of the U.S. in the late 1980s via ballast water discharge from ocean-going vessels. Boat inspection and decontamination programs began in 2008.

In response to a request by the National Aquatic Nuisance Species Task Force (ANSTF), the Western Regional Panel (WRP) developed the Quagga-Zebra Mussel Action Plan (QZAP) to reflect the rising threat of invasive quagga and zebra mussels in the West. The WRP includes 19 western states, federal agencies, tribes and other invasive species stakeholders. The goal of the QZAP is to summarize strategies to address the invasion of these mussels into the West, and prioritize needed actions to prevent further spread, respond to new infestations, and manage existing infestations. It is intended to serve as a common ‘road map’ of priorities for agencies and their partners.

One of the big challenges was legal authority, due to boats being private property. Legal authority is needed for the boats to be inspected for invasive species. This kicked off a six-year effort called Building Consensus in the West. The Western Regional Panel’s Building Consensus in the West Workgroup was a multi-year process to facilitate an ongoing discussion among state ANS coordinators and the National Park Service to produce science-based standard protocols and procedures for preventing the further spread of zebra and quagga mussels in the west through recreational watercraft, in tandem with the development of a legal framework for watercraft inspection and decontamination programs. Much of the work conducted through Building Consensus was funded by the U.S. Fish and Wildlife Service, as well as the National Oceanic and Atmospheric Administration (NOAA). The goal of the consensus, and the resulting

actions and work products, was to achieve greater consistency among western state agencies implementing watercraft inspection and decontamination for zebra and quagga mussels, both in management practices and with respect to legal parameters.

Congressional legislation began providing funding for the effort. Partnering with the marine industry (National Marine Manufacturers Association of the American Boating & Yachting Council) also began. The stage is being set as to how things will move forward over the next 10-20 years. The WRP is currently drafting updated recommendations for the Quagga-Zebra Mussel Action Plan.

In 2004, Pacific States Marine Fisheries Commission (PSMFC) developed the Watercraft Inspection and Decontamination Interception Training (WIT) Program with funding from the USFWS 100th Meridian Initiative and Bonneville Power Administration. It was originally designed as a 90-minute training to enlist the voluntary help of boating law enforcement officers in the western United States to educate boaters and inspect high-risk watercraft during normal boater safety duties. The WIT program now includes three levels of training. Each level of training is designed to provide the necessary tools for watercraft inspection program staff to provide consistent information. The Level One WIT course offered by the PSMFC is recommended for anyone who will be directly involved in watercraft inspection. In 2008, a Level Two WIT program was developed. Level Two WIT training is an intensive two-day training for 10-12 individuals typically held at Lake Mead, Nevada. This training is designed for people who will be responsible for developing or managing watercraft inspection and decontamination (WID) programs for their agency, tribe or organization. Level III WIT Training is for state and federal AIS coordinators and WID site supervisors, including local/state/federal governments, marinas and concessionaires.

The Western Regional WID Data Sharing System is a mobile application that works on an android or IRS phone. This System is owned and managed by Colorado Parks and Wildlife (CPW), funded by numerous agencies, and used by all western states and provinces performing WID to receive infested watercraft movement notices. There are ten western states, plus select National Parks, private industry locations and local governments using the system for all of their WID data management needs. It is available free of charge to WID stations. There is also a website application for managers. A help desk for tech support is also available for inspectors to call. Elizabeth stated that one of the benefits about the data sharing system is that they are able to do a lot of risk analyses. They know where boats are moving from infested waters to negative waters, so they can determine where to put their resources, and how they can collectively share the responsibility of prevention and contain the invasive mussels.

Unfortunately, the states that are not fully engaged in the effort continue to see more and more infestations. Elizabeth stated that they want to expand the collaborative. They have new opportunities through Army Corps of Engineers funding to expand the effort further east. Important advocates for the program are elected officials, directors, state legislators, county commissioners, city council members, etc. who will provide funding.

Another important requirement is to have boaters clean, drain, and dry their boats. If funding is available, resources can be provided for clean, drain, and dry, such as self-certification programs, pledges, self-cleaning systems, etc. The next level is a mandatory program that could be implemented, which Colorado has. A watercraft cannot be launched if it has been in another state without first getting it inspected and decontaminated. If launching and retrieval occurs in a high-

risk water body, an inspection must be done by a professional. Enforcement and the capacity for multi-state prevention could also be added, which is what the Columbia River basin has been very successful doing in terms of having multi-state highways protecting the entire basin.

Most states are somewhat moving to a hybrid model where they have their high-risk waters protected, have some highway stations, voluntary inspections like roving patrols, which are largely education-based, that move around from lake to lake. Arizona has a by-appointment option, where a contractor can be called to schedule an appointment to have a boat decontaminated.

Update on new introductions

Wesley Daniel gave a PowerPoint presentation entitled “USGS NAS Database: New Invasions and Actionable Tools”. New invasions from 4/13/2019 – 11/15/2019 include 24 plants, 13 fishes, 12 mollusks, 10 frogs, and 4 marine fishes. States with new invasions include North Carolina, South Carolina, Texas, Florida, Georgia, Mississippi, and Louisiana.

The NAS API is now compliant with NAISMA mapping standards. New spatial data include: US waterfalls, boat ramps, Marine Fish Landing web page, and native ranges. Actionable maps and tools include: Alert Risk Mapper; Flood and Storm Tracker (FaST); Impact Tables; SEINeD Tool. The Flood and Storm Tracker (FaST) identifies flooding conditions that could breach drainage divides from coastal storm surge or inland flooding; map flood “connection points” between drainages; make use of field collected data to determine flood connections via USGS/NOAA data of stream gages or storm tide sensors, and USGS high water marks. The next steps for FaST are parasites and diseases.

The bio-surveillance tool SEINeD (Screen and Evaluate Invasive and Non-native Data) will allow stakeholders to upload a biological dataset (fish, invertebrates, plants, etc.) collected anywhere in the conterminous US, Alaska, Hawaii, or US Territory that can be screened for invasive or non-native aquatic species occurrences. It can check the spatial accuracy of the sighting location, based on user provided state and county information; check the indigenous status of the species at the sighting location; provide additional spatial information about the sighting location.

Invasive species environmental DNA data standards and database

Wesley Daniel gave a PowerPoint presentation entitled “Invasive Species Environmental DNA (eDNA) Data Standards and Databases”. Sources of eDNA in a drop of sea water include damaged tissue, skin/scales, metabolic waste, free DNA. Water is collected via water filtration with ANDe. The filter is preserved with ethanol and stored. The samples are shipped to USGS. The lab detects DNA, and Smith-Root provides results in a report. It is the first effort to aggregate all aquatic invasive species eDNA data in a single database, in collaborative effort with NOAA, the US EPA, US Fish and Wildlife Service, Forest Service, and US Department of the Interior.

The NAS’s approach to adding eDNA is to inform a state first of any eDNA sighting, then the NAS database, and then the public. The next approach is to develop conservative minimum data standards to help guide eDNA monitoring and add information into the database, based on the consensus of agencies and experts. Consensus is reached through some straight-forward standards such as date, latitude/longitude, etc. Some may need discussion, such as isolation approaches (list of approved/trusted sources). Some will be challenging, such as detection and

quantification. Low-shedding animals might require higher sample volume. What is the minimum volume per species or class? How/when to report inhibition? The next approach is to use an easy to interpret hierarchy of statuses to help understand what a positive eDNA sighting means, and work closely with the state and federal state eDNA community (federal and state). In March 2020, regional townhall eDNA webinars will be held. Regional townhall eDNA webinars will be held March 2, 9, 16, 23, and 30, in 2020.

Status of Cuban tree frogs in Florida and their threat to other GSARP states

Steve Johnson provided a Power Point presentation entitled “Status of the Cuban Treefrog in the Southeast”. The Cuban treefrog is native to Cuba, the Bahamas, and the Cayman Islands. It arrived in Florida in the 1920s via hitchhiking on cargo ships from Cuba. Human-mediated movement aided in the colonization of the Florida peninsula and beyond via ornamental plants, palms, and vehicles.

Cuban treefrogs depredate native treefrogs in suburban and natural areas, and cause declines of native frogs. Tadpoles are superior competitors. The frogs produce noxious skin secretions, and their feces are messy. They invade homes and bird boxes, and damage electrical equipment. Their calls are annoying, and cause people to lose sleep. They breed in ornamental ponds, swimming pools, ditches, ponds, etc.

Cuban treefrogs are established throughout the Florida peninsula from Cedar Key, to Lake City, to Jacksonville. They are the most common treefrog in suburban areas from Orlando, south. They are found in human-modified and natural areas. Records are accumulating in the Florida panhandle, and there likely will be/are breeding populations there.

There is an established population in Georgia. There is a breeding population on Jekyll Island. The likely invasion pathway was likely via imported palms. Other counties with records are Chatham, Spalding, Walton, Wilkinson, and Dougherty.

There are established populations in Louisiana. The first breeding population was discovered in New Orleans, near Audubon Zoo. The likely invasion pathway was via imported palms from Florida. Removals are ongoing, and the population size is fluctuating. There is a second population in St. Rose. The invasion pathway is unknown. Parishes with records are: Jefferson, St. Tammany, East Baton Rouge, and Lafayette. Cuban treefrogs from other GSARP states include: Texas (Harris, Montgomery, and Midland Counties); Mississippi (Jackson and Lamar Counties); Alabama (Dauphin Island, Lee, and Mobile Counties); South Carolina (Beaufort, Jasper, and Charleston Counties); North Carolina (Alamance and Orange Counties).

In summary, it is recommended to be vigilant for Cuban tree frogs in local states and regions; learn to identify Cuban tree frogs; confirm sightings via digital images emailed to experts; report to EDDMapS, USGS-NAS, state agencies; take action to eradicate incipient populations; educate others.

Overview of the Miccosukee tribe’s ANS issues and activities

Craig van der Heiden gave a Power Point Presentation entitled “Miccosukee Tribe of Indians Invasive Species Program”. The program has management plans for plants, reptiles, fishes, insects (in development), exotic fishing competition.

Objectives for a project for canal restoration include habitat restoration to remove aquatic vegetation and exotic vegetation along the canal bank; implement the Miccosukee Fisheries Management Plan to capture native fish, remove exotic fish, and reintroduce native fish; provide community outreach and public awareness. Previous canal restoration was completed in 2009. The canal had reverted back to the previous condition.

Numerous exotic fish species were removed, including pike killifish, black acara, Mayan cichlid, African jewelfish, sailfin catfish, and spotted tilapia. Rotenone treatments were also done. Native fish species restocked (USFWS) included Florida gars, bowfin, largemouth bass, bluegill, red-ear sunfish, and shiners. The Miccosukee community and youth participated in invasive vegetation removal, invasive fish removal, amphibian surveys, insect surveys, and birds and other animal surveys.

The Miccosukee Python Removal Program started as a result of several incidental captures. Research and management began in 2017. The levees are being monitored, but there have not been good results. Detection dogs are being used to increase the Burmese python capture rate. In 2019, python canine hunts were implemented. A successful detection dog program has been developed. Despite their large size, pythons are very cryptic, and detectability can be as low as 1%. In thick vegetation or tall grass, finding pythons is unfeasible by the human eye or a human search team. Detection dogs have been used in wildlife management. Python dogs were tested in 2011, and showed a considerable increase in success rate over human search teams. An area can be searched faster by a dog. In 2018, the levees were being monitored once or twice a week, or monthly. In 2019, the detection dogs are being walked two or three times a week in January, February, and at the end of May and June. Python captures have increased by 21%, compared to 2018. In only three months of 2019, more pythons were captured than in 2018. The majority of python captures in 2019 were done with the help of the detection dogs.

Overview of North Carolina's hydrilla control efforts

Rob Emens gave a Power Point presentation entitled "Overview of North Carolina's Hydrilla Control Efforts". The Lake Waccamaw Hydrilla Project is a good example of the power of partnerships. It is the project that catapulted the Aquatic Weeds Program into the legislative spotlight. Partnerships are important to the projects. It provides technical expertise from NGOs, academia, government agencies, and industry; funding from local governments and state agencies; monitoring services by state agencies and academia.

A Point Intercept Survey was done in 2012 on plant biovolume across the 9,000-acre lake, derived from SONAR data. The survey estimated 608 acres of hydrilla. From 2013 – 2019, research, herbicide, contract oversight, monitoring, and vegetation surveys have all been done. The tuber bank should be exhausted. The project is considered a success, but monitoring will continue.

The Eno River *Hydrilla* Project is another good example of the power of partnerships. It is the first time that NC's Aquatic Weeds Program managed hydrilla in a lotic system. Historically, projects were solely conducted within lakes and ponds. In partnership with the Eno River *Hydrilla* Management Task Force, meetings were held approximately four times per year. Eno River *Hydrilla* Management Task Force is a partnership between government agencies, non-profit organizations, and academia. It is composed of environmental managers and stewards, stakeholders, and aquatic vegetation management experts. The objective is to bring the hydrilla to below nuisance level, and make recommendations for management, etc. Many partners

participate directly or indirectly with the website, open houses, press releases, focused mailings to property owners adjacent to the river, signage for the river, and injection system.

The Eno River Association and Eno River State Park organized a volunteer day to hand-pull hydrilla at specific sites. Plants were collected in bags. NC Wildlife Resources Commission staff conducted a grass carp tagging study. NCSU Toxicology Department did a pebble snail study on reproduction, etc. NCSU Crop Science did herbicide trials to determine sensitivity of riffle weed to fluridone and endothall. NC DHHS Division of Public Health did public health evaluations for potential exposures to fluridone or endothall is used in the Eno River.

The Eno River Hydrilla Management Task Force, in cooperation with the North Carolina Division of Water Resources Aquatic Weed Program and the North Carolina Division of Parks and Recreation, hired SePRO Corp. to apply the herbicide Sonar Genesis in a 16-mile area of the river. Herbicide treatments from 2015 – 2019 have resulted in hydrilla growth being fully suppressed. No vegetative growth was observed in the treated area. The Task Force has not yet recommended activities for 2020.

The purpose of the NCDENR's Aquatic Weed Control Program is to provide local government and citizens of North Carolina with technical and financial assistance that will promote the prevention and management of noxious aquatic weed infestations. The program was established in the early 1980s as a state response to hydrilla found in several lakes in the Raleigh area.

The Chairman again provided the opportunity for public comment. No comments were received.

Wednesday, November 20, 2019

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

Region 4 USFWS/Small Grants Program

Cindy Williams reported that the Department of the Interior is reorganizing, and boundaries are being re-drawn. Kentucky will be lost, but supervision will be retained for Louisiana and Arkansas. Part of Texas, Oklahoma, and Missouri are being acquired. With this reorganization, they are changing how the budgeting and administration process is going. DOI has the Joint Administrative Operations, which is all of the budget, all of the human resources, all of the diversity and civil rights, and IT. All of those people now work for DC headquarters, not in Cindy's region. When it comes to funding the state grants and the small grants program, Cindy is not sure right now what the new process will be. This reorganization will go into effect on January 1, 2020.

Senator Mitch McConnell decided that funding to combat Asian carp in the lower Mississippi, Tennessee and Cumberland Rivers needed to be expanded. Typically, that funding has gone only to Kentucky and Tennessee. Two years ago, funding was also given to Mississippi for commercial fishing in Pic Wick Reservoir. In 2019, Alabama received funding to combat Asian carp. In FY2020, the budget for Asian carp will grow dramatically. It will expand from Kentucky, Tennessee, Mississippi and Alabama, to potentially include Arkansas and Louisiana. If passed, Cindy will have to do a separate grant for Arkansas and Louisiana, specifically for Asian carp. Senator McConnell has ordered the FWS, with support from USGS, to do a massive

Asian carp removal from Lake Barkley in Kentucky in February 2020. Crews will work seven days a week, daylight to dusk, performing electrofishing for the entire month of February. Cindy is not sure what will happen to the fish once removed.

James Ballard asked if the forthcoming Asian carp funding will require a state match. Cindy stated that right now, it has the same state match as the rest of the FWS funding. There has been some discussion that some of the states are finding it difficult to match when there are hundreds of thousands of dollars involved, so adjusting the match percentage could be a solution.

James reported that over the last five years, 33 projects totaling \$710K have been funded. The program has resulted in increased collaboration and communication between FWS, GSARP, and the academic community. For FY 2019, the projects selected for funding are: Development of Invasive Species Environmental DNA Data Standards and Database for the Southeast U.S. (US Geological Survey); Model Bait Regulations to Reduce Aquatic Invasive Species (Univ. of Mississippi); Risk of Injurious Fish Species to the Aquatic Nuisance Species Task Force Gulf and South Atlantic Regional Panel States (Univ. of Florida); Feeding Ecology and Species Composition of the Invasive Lionfish Population, *Pterois* sp., off the Louisiana Coast (Louisiana Dept. of Wildlife & Fisheries); Determining the Risk of Consuming Fish and Waterfowl Harvested in Reservoirs Infested by Hydrilla/*Aetokthonos hydrillicola* Producing a Novel Cyanotoxin, Aetokthonotoxin (Univ. of Georgia); The Use of Genetics, Shell Shape, and Habitat Conditions to Identify Hotspots for Native and Invasive Apple Snails that Harbor Parasitic Worms in Lake Okeechobee, Florida (Jacksonville State Univ.).

James asked the Panel if they felt that the Research Priorities in the RFP needed updating, since it has been several years. If so, James can send them to the review committee, and then go over the drafts at the panel mid-meeting conference call. The panel members decided that it needed to be done.

Dennis Riecke asked the panel if there was a list on the GSARP website of projects that were funded under the small grants program. James stated that currently there is not, but a page could be developed that lists them. It has also been discussed that all of the final reports be put on the website, so James will look into accomplishing that.

Overview of Forest Service ANS activities in the region

James Whalen gave a Power Point presentation entitled “US Forest Service - Southern Region”. In the past, the Aquatic Nuisance Species Strategy was for aquatic animals, and did not include aquatic plants. The elements of the program are for prevention, detection, control and management, and rehabilitation and restoration.

The National Forest of Florida is in partnership with the FL Fish and Wildlife Conservation Commission, US Army Corp of Engineers, and FL Department of Environmental Protection Division of Recreation and Parks for treatments of hyacinth, hydrilla, and water lettuce.

An infestation of giant *Salvinia* on Okhissa Lake in the Homochitto National Forest is being sprayed. Triploid grass carp are being stocked for hydrilla infestation in Kisatchie NF in Louisiana. Giant *Salvinia* in the Kisatchie National forest in Louisiana is receiving an herbicide treatment. In the National Forest in Alabama, alligator weed and torpedo grass management is being done in ponds. Environmental analysis is being done on Sumter NF in South Carolina.

Restoration is being done for brook trout. In Alabama, crayfish research is being done in the Lewis Smith Reservoir Area where Kentucky River crayfish have been discovered, and in the Cahaba River Drainage where Virile crayfish have been found. Impacts of dams on native crayfish genetic structure vs. non-native will be studied.

Mussel research is being done in the Rockcastle River system on the freshwater Asian clam, *Corbicula fluminea* and Cumberland Bean mussels. In summary, juvenile mussel growth was predicted well by water temperature and *Corbicula* abundance. *Corbicula* could be an explanation for low growth in streams that have lost their mussel fauna, and could explain faunal losses. *Corbicula* has been largely ignored as a factor in mussel declines, and a fresh look should be done in other contexts. No evidence of serious coal mine pollution or other water quality issues in the Rockcastle River system. There is little relationship between growth and water chemistry factors.

Aquatic Nuisance Species Task Force Update

Susan Pasko provided a Power Point presentation on the Aquatic Nuisance Species Task Force Update. Currently, there are 43 approved management plans – 40 state, and 3 interstate. Susan said that each year, they give small amounts of money to the states for the implementation of the ANS plans. For the last two years, FWS has received \$2M for the grant program. That money is divided evenly between all states to apply for that funding. For 2019, each plan received approximately \$45,000 for its implementation. It is up to the states to decide how the funds are used.

Susan stated that one of their recent tribal liaisons has decided not to renew their membership to the task force, so a seat is currently available. She asked that if anyone knew of someone interested in fulfilling the role as tribal liaison to the task force, to please put them in contact with her.

The last ANS Task Force meeting was held November 6-7, 2019 in Beltsville, Maryland. Action items were: to develop a concise synopsis of key invasive species interagency organizations; Co-Chairman will establish an ad-hoc subcommittee to review the Draft ANS Task Force Bylaws and operating procedures. Members interested in serving on the subcommittee should let the co-chairmen know by December 1st; EPA and USCG will report at the next ANS Task Force meeting on “Intergovernmental Response Framework for Vessel Discharge Risks” and how the ANA Task Force can engage; ABYC will be invited to provide an update on the status of the Technical Information Report marketing at the next ANS Task Force meeting; members and regional panels are invited to provide suggestions to the co-chairs on format, content, and layout of the next Report to Congress; subcommittees will refine their work plans and resubmit them to the ANS Task Force by December 16th. Members and panels will provide comments on the work plans by January 13th.

The ANS Task Force Strategic Plan for 2020 – 2025 includes six goals. The Coordination goal is to maximize the organizational effectiveness of the ANS Task Force by establishing effective processes that create opportunities for members and participants to work collaboratively across agency and organizational lines. Draft FY 2020 Work Plan outputs include: developing bylaws and membership expectations for members and regional panels; establishing a process for members to respond to recommendations brought forward by the regional panels; annually assessing Aquatic Nuisance Species Task Force (ANSTF) accomplishments and report on the progress and gaps to the Strategic Plan and report results to Congress.

The Prevention goal is to develop strategies to identify, assess, and manage the risk of ANS and their pathways to prevent new introductions in the waters of the US. Draft FY 2020 Work Plan outputs include: evaluating and refining the NISC/ANS Task Force pathway risk assessment process and completing guidelines for the use and interpretation of these tools; working with Federal agencies to make importation data electronically available and searchable for species imported into the US; assessing new ANS introductions to determine where prevention measures may have been lacking, been ineffective, or resulted from gaps in authority; entering into national prevention practices with responsible industry sectors that consider invasion risks.

The Early Detection and Rapid Response (EDRR) goal is to develop strategies to inform a nationally coordinated EDRR approach. Draft FY 2020 Work Plan outputs include: developing a framework for the use of horizon-scanning tools to determine US hotspots to be targeted for monitoring; developing a report describing available tools for interpretation of eDNA detection patterns, including conclusions and recommendations regarding current best practices and future research needs; developing guidance on threshold and decision-making criteria to determine appropriate management actions to new species detections; developing a report describing where emergency response funds are currently in use and provide a model to establish and administer an emergency rapid response fund.

The Control and Restoration goal is to facilitate capabilities to control established ANS populations and restore impacted habitats. Draft FY 2020 Work Plan outputs include: assessing the state of each ANS Management and Control Plan, including current activity and management needs; drafting guidance for ANS Management and Control Plan development; surveying members and panels for gaps in control and restoration, and informing the ANSTF of the gaps for consideration as a future research priority; identifying federal and non-federal entities that have the ability to develop and test new control and restoration measures, and partner with these entities to address gaps identified in control and restoration measures.

The Research goal is to facilitate research in support of implementing an ANS program for waters of the US. Draft FY 2020 Work Plan outputs include: developing an annual priority research list that shows both regional and national priorities; surveying members and regional panels for a list of research entities that have the ability to address ANS research needs; developing a model for the ANSTF research grant program, including exploration of options for obtaining funds to administer the program.

The Education and Outreach goal is to develop strategies to increase awareness and change behaviors responsible for introducing and spreading ANS in waters of the US. Draft FY 2020 Work Plan outputs include: conducting an assessment of ANS national campaigns and ANSTF guidelines to evaluate the progress of outreach goals and effectiveness in changing behavior; finishing the Stop Aquatic Hitchhikers portal to serve as a clearinghouse for campaign materials; defining and identifying leaders for an ANS Community of Practice to provide a forum for dialogue to share ideas, evaluate data, and improve outreach consistency; developing templates for ANS Task Force messaging and briefings to ensure consistency.

The Stop Aquatic Hitchhikers website Phase II: Partner Portal will be coming soon. There will be three different components to the portal – 1.) a “graphics library” that will give partners the ability to go into the grand standards and print a high-resolution graphic so they can customize with different logos or slogans. 2.) a “marketing showroom” where submitted photos can be put

into a usable format or resolution so they can be customized; and 3.) an “image library” that contains good images of invasive species that are very clear, with high resolution that can be used for a campaign. They hope it will be available on the website early in 2020.

Discussion of ANSTF recommendations

James Ballard asked the panel members if anyone had any recommendations to present to the Task Force. **Dennis Riecke** stated that he is not aware of any screening being done for animals and aquatic plants before coming into the U.S. His recommendation is to create a mechanism to screen animals and aquatic plants before they get imported. James stated that one of the goals is to attempt to digitize all of the imports, down to species level, of which species are being imported, and how many. Right now, species are “lumped” on import documents. Other paperwork/invoices actually have species levels and the number of those species being imported, but those are not digitally available. The documents are all scanned to a computer, which is difficult and time-consuming. If the data on imports were digitized, information on the species and total numbers could be available at any time, and “red flag” species could be identified. If there was one computer program that importers could use to develop their imports by selecting species from a database, it could generate an invoice and a barcode that would be placed on the box containing the species. Importers would then scan the box, and on their tablet or iPhone, they would have a list of species that included an image. There would also be a database of what species were being imported. James stated that along with that system, a risk assessment could be added in a computer format that would match existing species data with a closely-related species that is a high invasion risk, and could flag the species as an alert so a rapid risk assessment can be done, before it is imported.

James felt that working it up through the Prevention work group of the Task Force would be a good way to proceed. Several panel members stated that one of the issues is that it is being assumed that there is more information to do risk assessments than there actually is, and there are species coming in that have no information. Also, a large number of species being imported are mischaracterized.

Dennis made a recommendation that the Task Force ask the USFWS to explore the current process USDA uses for importing produce, etc. into the U.S., for possible applications for the aquatic animal trade, pet trade, and all aquatics. **A Motion was made to approve the recommendation. It was seconded, and the Motion was approved.**

Overview of Smith-Root’s eDNA Sampling System and Demonstration

Austen Thomas gave a Power Point presentation entitled “The Smith-Root eDNA Sampler System”. There are current tool limitations for eDNA sampling. Pore sizes are not designed for eDNA, there is minimal control over the filtration process, and sampling gear is somewhat cumbersome and not purpose-built. The Smith-Root engineering team designed and created the eDNA Sampler Backpack, a fully integrated eDNA sampling system. The compact unit was designed for portability and aquaculture applications. It can also be used in salt water. The cost of the sampler is \$5,495.

The backpack has a “smart” pump with sensor feedback, consumable storage, remote control for pump, and single-use inline filter housing. Single-use filter packs are better because bleach sterilization can introduce a contamination risk, and sterilization procedures are time consuming and costly. The filter housings take any 47mm membrane filter, and minimizes sediment accumulation (high pressure, low velocity). On-site filtration advantages are that there is

immediate eDNA preservation, which prevents loss during transport; a large volume of water can be concentrated, which improves detectability; water transport can be prohibitive, which limits the sample size. A self-preserving eDNA filter reduces the chance of contamination, no filter membrane transfer step, no chemical or cold storage, and reduces per sample field time. The pressure threshold was designed for the backpack because delicate particles might break when the pressure is too high. A pressure of 300-400 mmHg is recommended. The flow meter sets a target flow rate, has a filter clogging alert, and the meter volume is filtered.

A six-month preservation trial of 42 replicate NZMS eDNA samples, half ethanol-preserved, and half self-preserved was done. There was no significant difference in eDNA quantity over six months – slightly higher eDNA recovery from self-preserved. A field trial was also done. Self-preserving filters contained approximately 2 times the eDNA of ethanol-preserved samples on average.

Beta testing for brook trout was done by the US Forest Service National Genomics Center. GFF and PES 5.0µm self-preserving were similar to the standard method, and 1.2µm self-preserving filters took longer to filter. GFF self-preserving were inhibited and degraded, and 1.2µm and 5.0µm PES self-preserving had comparable yields to standard. The 5.0µm self-preserving had comparable eDNA yield and filtration time to the standard NGC method. No significant difference was found in perch eDNA between self-preserved filters and ethanol preservation. There was slightly more eDNA on 5µm. In conclusion, in eDNA preservation of >6 months, the self-preserve filters are comparable or better than ethanol in field trials. The 5µm filters performed similarly to GFF for flow rate and eDNA yield. GFF filters do not preserve well in housing. Field trials with larger sample sizes are in the works.

A paper was published by the British Ecological Society in 2018 entitled *ANDe™: A fully integrated environmental DNA sampling system*. Conclusions of the paper were that the system is fast – 2L sample was collected in three minutes; there was a peak in filtration efficiency at a flow rate of 1.0L/m; when volume filtered is maximized, 5µm filters captured significantly more eDNA than 1µm filters; high filtration pressures may reduce eDNA retention; pressure should likely be standardized to avoid bias.

In the future, a low-cost (approximately \$1,000) rental eDNA sampler for citizen science projects will be created.

Austen displayed the eDNA Sampler Backpack, and gave a demonstration on how it works.

State Reports/ Members Forum

Alabama

Craig Newton reported that the Asian tiger shrimp has been a species of concern since 2006, when it was first observed in Alabama's inshore waters. After the first individual was documented, captures of Asian tiger shrimp have increased. A confirmed report of a single specimen occurred in 2008 near Mobile Bay Light. In 2009, there were five confirmed reports. From 2006-2009, the distribution of Asian tiger shrimp was primarily restricted to Alabama's southern inshore waters. Its distribution extended to northern Mobile Bay and into Perdido and Wolf Bay in 2011. The 43 confirmed reports during 2011 indicate the Asian tiger shrimp occurs within all of Alabama's primary estuary basins; however, concern surrounding Asian tiger shrimp has decreased within the commercial shrimping community, which has resulted in fewer

validated reports. Communications between AL MRD personnel and commercial shrimpers indicate that a significant abundance of Asian tiger shrimp occur within Alabama waters, despite the reduction in validated reports. Evidence suggests that Asian tiger shrimp have become established in Alabama's waters.

Several invasive species have been documented in Alabama coastal waters – tessellated blenny, Bocourt swimming crab, Australian spotted jellyfish, Asian green mussel, Asian tiger shrimp, and red lionfish. Unfortunately, the ecological effects of these invasive species are poorly understood in Alabama's estuaries and Gulf of Mexico waters. Prey of Australian spotted jellyfish include early life history stages of many commercially and recreationally important finfish, and the temporal/spatial distribution of Australian spotted jellyfish could drastically increase finfish larvae/egg mortality rates if spawning events coincide with swarm activities. The Bocourt swimming crab could compete for resources with the native blue crab. The current status of the Australian spotted jellyfish and the Bocourt swimming crab, however, does not indicate that these two invasive species pose an imminent concern. Tessellated blenny and Asian green mussel do not appear to pose an immediate threat, but their distribution and abundance should be monitored to ensure early detection of proliferation. The Asian tiger shrimp and red lionfish continue to be invasive species of heightened concern, and their broadened distribution, increased abundance, and/or documented negative effects on native species warrants concern.

The latest invasive species observed in Alabama's marine waters was an Amazon red tail catfish in July 2016. It was collected in a recreational crab trap at a private dock on the Bon Secour River. A Bocourt swimming crab was collected in a commercial trap during an AL DCNR/MRD onboard fisheries observation trip in November 2016. The location of the capture is south of Lillian Bridge and north of Ross Point in Perdido Bay. No other observations of the Bocourt swimming crab have been made since the 2016 observation.

Red lionfish have successfully colonized the Gulf of Mexico waters offshore of Alabama. The first confirmed report was documented in June 2011 by a spear fisherman who collected an individual from an oil/gas platform approximately 43 miles south of Dauphin Island. During the 2012 diving season, a recreational diver reported observing approximately 60 lionfish during a dive at Trysler Grounds. In June 2012, a diver reported observing up to 100 lionfish at an artificial pyramid reef. The diver would not disclose the exact location. After a lionfish rodeo in June and July 2012, 26 lionfish were donated to AMRD. No collection information was obtained by the rodeo coordinator.

In December 2012, AL MRD received a grant from 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 of the lionfish invasion, and streamline the general coordination between state agencies, federal agencies, and the public. Eighteen dive surveys were completed by AMRD personnel during 2013. T-shirts were distributed to members of the SCUBA community who were active in submitting reports, samples, and increasing public awareness. Additional funding was received from Gulf States Marine Fisheries Commission in 2014 to continue the monitoring and continue increasing public awareness. In 2014, AMRD personnel conducted SCUBA surveys at 18 reef sites, and created an Adopt-a-Reef program that emphasizes the reporting and capturing of lionfish. The Adopt-a-Reef program features a web-based application that allows for the submission and viewing of reports collected by Adopt-a-Reef participants. To date, 50 members of the public are enrolled in the Adopt-a-Reef program, and 57 reports have been submitted by the program's members.

Fishery-independent monitoring of reefs offshore of Alabama report a similar pattern in the lionfish invasion. Remotely Operated Vehicles (ROV) surveys within the Alabama Offshore General Permit Reef Zone from 2011 through 2015 indicate a widespread distribution of lionfish between 10 nautical miles and 50 nautical miles offshore of Alabama. No red lionfish were observed during 2011 ROV surveys, but frequency of occurrences was 100% during 2015 ROV surveys. In 2016, spearfishing tournaments began to specifically target red lionfish. A weekend-long “Lions on the Line” tournament was held at FloraBama during 2016, and 1,662 lionfish were harvested. The Alabama Lionfish Challenge tournament was held from May 26, 2018 through September 3, 2018. The recreational division harvested 540 lionfish, and the commercial division harvested 278 lbs. of lionfish. Tournaments were also held in April 2019, when 2,140 lbs. of lionfish were harvested, and September 2019, when 1,296 lbs. of lionfish was harvested during the tournaments.

The spatial distribution of red lionfish has not changed after becoming established; however, the rate of population growth has changed over time. During the first several years of invasion, population growth increased substantially from year to year. However, the rate of population growth during the previous few years has reduced such that it seems the population has plateaued to a stable state.

Florida

Kelly Gestring reported that the 5th Annual Lionfish Removal and Awareness Day was held May 18-19, 2019 in Destin, FL. The main event was attended by approximately 4,000 people. Attendees got to taste chef-inspired lionfish recipes, watch fillet demonstrations, participate in family-friendly games, and listen to live music. The tournament removed 19,167 lionfish from Florida waters. Nonnative Fish and Wildlife Program (NFWP) staff provided information on other non-native species programs and projects conducted by the FL FWCC at the Sebastian Lionfish Festival in Sebastian, FL. To date, participating divers in 19 derbies held around the state have removed approximately 19,000 lionfish from Florida waters. The Lionfish Challenge began on May 18, 2019, and ran through September 2, 2019. Recreational and commercial divers compete for prizes for removing the most lionfish. Participants qualify for the prizes based on the number or weight of lionfish removed. Both winners received a trophy, a feature article in FWC’s Recreational Saltwater Regulations, air refills, and a customized cooler. A total of 23,451 lionfish were removed by 134 recreational divers, and 14 commercial divers. The Lionfish King (recreational) submitted 1,194 lionfish, and the Commercial Champion submitted 3,193 pounds of lionfish. A new contest this year provided cash prizes for the smallest and largest lionfish. The top three submissions for each category received prizes. Twenty divers submitted 30 entries. The smallest lionfish was 37mm, and the largest lionfish was 433mm.

The FWC partnered with Fishbrain AB, the world’s largest free-to-use app for anglers, to collect information on non-native freshwater fish. FWC has received over 4,000 non-native fish reports, but no reports of new non-native freshwater fish species have been submitted. Butterfly peacock, Mayan cichlid, and bullseye snakehead were the most reported species.

FWC staff use natural waters surveys to proactively determine the distribution and abundance of established species. If a new species is detected, management strategies are implemented to eradicate or minimize potential negative impacts. There is concern that associations between native and non-native fish species in natural areas may be different than in urban canals. By surveying natural waters, NFWP staff can compare their findings to those from urban canals to

better address these concerns, and study freshwater fish in natural areas. These surveys are complimentary to the Standardized Electrofishing Surveys for Nonnative Freshwater Fish. Staff sampled two natural areas: the Loxahatchee Slough and the North Fork of the St. Lucie River. These areas were sampled by electrofishing. Non-native and native fish were counted, and non-native fish were collected, measured, and weighed when possible.

On April 26 - 27, 2019, FWC and ECISMA partners held the 10th Annual Everglades Non-Native Fish Round Up. Twenty-five anglers brought in 1,195 fish weighing 679 pounds. A total of 18 different non-native fish species were brought in to two weigh-in sites in Miami-Dade and Broward Counties by anglers. No new species were collected, but some uncommon species included green severum, yellowbelly cichlid, pike killifish, and clown knifefish. Anglers are encouraged to keep and eat their fish each year. The remaining fish are donated to feed a variety of captive animals.

NFWP staff served as weigh-master for two Catch, Keep and Kill Bullseye Snakehead tournaments in May and September 2019. Sixty anglers participated in the tournaments, and 252 bullseye snakehead were caught.

FISK v2 risk screenings were completed for five injurious fish species included on the Florida Conditional List: Bighead carp, black carp, silver carp, Nile perch, and walking catfish. These species have been on this list for decades, but there was interest in reassessing risk of these species using new data and methodologies. All five species had mean FISK scores exceeding 10.25, the calibrated medium-high threshold for Florida. The three carps are well-known global invaders, and wide-spread in the Mississippi River drainage. Based on the FISK assessments, these five species appear to be of elevated risk to Florida; however, their elevated risk has already been recognized, with restrictions on possession and containment requirements. The management and research recommendations presented in the study will be considered for potential changes in regulatory status of these species.

FISKv2 was also used to assess the risk of 11 species of fish on the USFWS Injurious Species List that are not specifically listed by FWC as Prohibited or Conditional. These species include Crucian carp, Largescale carp, Prussian carp, Wels catfish, Eurasian minnow, Stone moroko, European perch, Roach, Amur sleeper, Zander, and Atlantic salmon. Alligator gar, which require a permit to possess, were also assessed, due to concerns over certified aquaculture facilities to possess, culture, and sell them if they originated from outside Florida. Based on the FISK assessments, five species appear to present an elevated risk to Florida: Crucian carp, Wels catfish, European perch, Prussian carp, and Stone moroko. There are concerns about potential impacts on native species in peninsular Florida in the event of introductions from commercial facilities or home aquarists. The management and research recommendations presented in the study will be considered for potential changes in regulatory status of these species.

Damselfishes are one of the most important marine ornamental fish groups. Collectively, over four million individuals are imported into the U.S. Evaluating high volume fish is important, because trade volume in aquarium species is thought to correspond to frequency of introductions. It is likely that some of these fish are released, increasing propagule pressure and the probability of establishment. In July 2019, NFWP executed a one-year contract with the University of Florida to apply the AS-ISK risk screening tool to the 11 species of pomacentrids selected for bio-profiles, including spiny chromis that is being monitored at a marina in Miami Beach, and the regal demoiselle that is established in the western Gulf of Mexico, and is spreading east

towards waters off the Florida panhandle. The regal demoiselle represents the only other established marine fish in the tropical western Atlantic besides lionfish. The FWC will use results from these risk screens to determine the most appropriate responses to mitigate potential impacts from and manage this group of fish.

African clawed frogs (ACF) were first discovered in the Riverview area east of Tampa in 2013-2014. Several attempts have been made to eradicate ACF from ponds in this area, but all were unsuccessful, as ACF returned to the ponds. FWC discontinued surveying ponds for ACF, and contracted with two universities to conduct additional studies. Finalized reports have been received by FWC for the first of two years of contracted African clawed frog research being conducted separately by the University of Florida and the University of Central Florida. The University of Florida is attempting to identify the spatial extent of SCF in the Riverview area using comprehensive surveys, identifying dispersal patterns, and performing thermal tolerance trials to set bounds on the potential distribution of ACF in Florida. Preliminary results from UF were the discovery of five additional ACF occupied sites; that ACF are negatively influenced by fish presence, but positively influenced by other anuran presence; that some ACF individuals traveled between occupied ponds; that although other environmental variables may help control ACF spread, they are able to survive both the warmest and coldest months of the year throughout much of Florida. The University of Central Florida set out to use disease ecology, population genetics, and environmental detection to understand and mitigate the ACF population in the Tampa Bay area. Preliminary results from UCF were: DNA thresholds for ACF were determined; genetic analysis began from Riverview and from a California ACF invasion for genetic comparison of populations to determine how genetics influence invasion; ACF presence is correlated with amplification of ranavirus intensity, but decreased prevalence and intensity of *Perkinsea*.

The number of issued Python Removal Permits (PRP) dramatically decreased during April 2019 – September 2019, as compared to the number issued in previous reported periods. This decline was due to the discontinuation of a large portion of this permit program. An internal records review found that despite the large number of permits issued, an insignificant number of pythons were reported or turned in to FWC staff from permittees. Therefore, permits issued to the general public have been discontinued. Permits requested by government agencies or Cooperative Invasive Species Management Area cooperators are still being issued on a case-by-case basis. The FWC is still looking for more effective ways to remove barriers, and engage the public in python management. In March 2017, an Executive Order was issued allowing the public to take non-native reptiles on 22 FWC-managed areas of south Florida. During that period, 107 Conditional Species Permits (CSP) were issued. The 11 research permits issued covered a range of species, mainly non-native reptiles like pythons, Nile monitors, and red-eared sliders. For importation and possession for personal use, 22 permits were issued, and 31 permits were issued for commercial use. For importation and possession for public exhibition, 17 CSPs were issued, particularly at zoological facilities and publicly-owned educational facilities. Four CSPs were issued for the importation of African tortoises, specifically for African spurred, leopard, and Bell's hinge-back tortoises. For the importation of Conditional reptiles, 16 CSPs were issued, mainly re-eared sliders and pythons. For red-eared sliders possessed as personal pets, six CSPs were issued.

Six core canals in Miami-Dade, Broward, and Palm Beach Counties will be electro-fished in October 2019 following the modified sampling protocol implemented in October 2016.

The next non-native fish chat and non-native fish slam are scheduled for November 2019. The non-native fish chat is an informal gathering of biologists for a one-day meeting of presentations and discussions on non-native fish topics. Following the Fish Chat, there will be a two-day fish slam that will focus on the L-67A/L-29 canals to sample for Bullseye snakehead. based on a positive eDNA finding and on infrequently sampled areas in urban canal systems in Miami-Dade and Broward Counties.

Matt Phillips reported that there was a new infestation of *Salvinia molesta* at a new site, in Central Florida near the Rainbow River, in private wetlands. Surveys are being done to see how large the infestation is. Treatment will begin shortly. Monitoring continues around the state, with eradication wherever it is found.

Georgia

Jim Page reported that during the 2019 sampling season, 5,931 flathead catfish were removed from the Satilla River. Flathead catfish were likely introduced through unauthorized stocking, and first observed in the Satilla River in 1996. During the mid-2000s, standardized sampling and creel surveys revealed declines in abundances of redbreast sunfish and bullhead catfishes coincided with significant increases in the abundance of flathead catfish. In 1996, the Wildlife Resources Division – Fisheries Management Section began removing flathead catfish from the Satilla River. In 2006, the Flathead Catfish Removal Project was instituted to control the population. Since 2007, over 85,000 flathead catfish have been removed. The size structure of the populations has declined. The average size fish removed progressively dropped from 5.8 pounds in 2007, to 2.0 pounds in 2019. Biomass per effort has also declined from 77.5 kg/hr in 2005, to 35.6 kg/hr in 2019. 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 intensive harvest will be required to control the flathead population.

GA DNR staff continue to remove blue catfish from the Satilla River. This non-native species was first recorded when two individuals were observed during a creel survey. In 2016, significantly increased numbers of blue catfish were observed and removed from the river. In 2017, 397 blue catfish were removed. Thus far, over 600 have been removed. Increased numbers of blue catfish concerns resource managers, and continued monitoring and removal will occur.

An oscar was captured in Lake Kedronin in Fayette Count by an angler, who reported it to GA DNR. The fish was euthanized. A tilapia was captured in Lake Seminole in Seminole County by an angler, who reported it to GON editor via a photo. The editor reported it to GA DNR. The disposition of the fish is unknown, since GA DNR could not contact the angler. A pacu was captured in Valley Lakes Pond in Fulton County by an angler, who reported it to GA DNR. The fish was euthanized. A northern snakehead was captured in a private pond in Gwinnett County by an angler who reported it to GA DNR. The angler released the fish prior to contacting GA DNR. GA DNR staff visited the pond and conducted multi-day efforts to confirm occurrence of northern snakeheads in the area and perform removal efforts. Thus far, five individuals, including the fish captured by the angler, have been removed from the area. This is the first known occurrence of snakeheads in Georgia. Ongoing monitoring and removals will occur if fish are found.

Commercial fishermen continue to periodically report catches of Asian tiger shrimp in Georgia waters, though they remain low. No reports were recorded during this reporting period.

Managers will continue to monitor the occurrence of this non-native species. GA DNR staff may potentially intercept tiger shrimp during fishery-independent standardized sampling conducted monthly at over 36 sites coast-wide. Results of the surveys suggest abundance of tiger shrimp in Georgia's sampled waters are low.

GA DNR continue to post Clean, Drain and Dry educational signs at boat ramps.

The Traveling Trunk was used at Third Grade Field Days at GA DNR/Coastal Resources Division in May, 2019. Approximately 450 third graders viewed the trunk. Talks were given about various invasive species.

Louisiana

In June 2019, LA DWF received a report from a local university professor that they had caught Asian swamp eels in Bayou St. John, outside of New Orleans. The eels were identified as *Monopterus albus*. Sampling has shown that the swamp eels occur in a two-mile stretch of the bayou. LDWF has developed a management plan to attempt to contain the swamp eels to this local area. This plan includes periodic electro-fishing, juvenile eel trapping, habitat reduction through spraying invasive vegetation and stocking of known eel predators. The biggest concern is that the eels will escape the area and impact the state's crawfish and rice farms. Over 65 eels have been caught.

Nile tilapia were reported in a private pond near Shreveport. The land owner caught the fish in Texas, and stocked his own pond. LDWF sampled the downstream lake. No tilapia were detected in any areas outside of the initial reported pond. The pond was treated with rotenone, and 99 tilapia were killed. LDWF will do a follow-up sampling in the spring to ensure the population was eradicated.

Blue tilapia have been captured in the University Lakes of Baton Rouge. During a routine sampling event, LA DWF Inland Fisheries electrofished one tilapia. Within a week, another tilapia was reported via a Facebook group. The second fish was below the weir of the University Lake in an outfall canal. Investigations are ongoing into how the fish got into the lakes. Surveys are being planned for November and in the spring. This drainage ultimately flows into Lake Maurepas and Lake Pontchartrain.

A report of a pacu in the Covington area was received. It was caught by a fisherman using bread for bait. The fish was released back into the pond, and visits did not yield any sightings of the fish. The pond is in a recreational park, so it is assumed that it was an aquarium release. Staff will check back in the spring to see if the fish can be sighted or caught.

There is an existing population of tilapia in the drainage canals and ditches around Port Sulphur, following massive eradication efforts in 2008-2009. Following extensive rotenone applications, native predators were heavily stocked in the area in hopes of depleting any remaining tilapia. During the summer of 2017, approximately 30 tilapia were captured via electrofishing samples. The area was not surveyed in 2018. If manpower and conditions allow, sampling should occur before the end of the year.

During 2019, the LA DWF received approximately 750 reports of apple snail infestations. A crawfish farmer reported that they were catching five-gallon buckets full of apple snails in his daily trap hauls. He will report back to DWF if his crawfish catch is reduced by the infestations.

Apple snails have been reported in the rice growing region of LA. So far, there have been no reports of any impacts to the rice fields.

Populations of bighead, black, grass, and silver carps are now successfully reproducing in the Atchafalaya, Mississippi, Ouachita, and Red Rivers. They continue to slowly spread into smaller coastal river drainages. LDWF inland Fisheries Districts collected ichthyoplankton samples during May and June that will be used to determine the amount of Asian carp larval fish present in locations around the state. This study will be compared to previous samples to determine if the distributions have changed. Some black carp were collected during sturgeon recovery operations in ponds in the Bonnet Carre spillway following the flooding from the Mississippi River.

Zebra mussels were found in Blackhawk Scar lakes, approximately three feet above the water. All mussels were dead.

In 2019, LA DWF received five reports of tiger shrimp from commercial and recreational angler catches along the LA coastline from the TX state line to the Mississippi River. The sightings were in nearshore/bay areas.

During the summer months of 2019, LA DWF's dive team performed roving diver surveys in offshore areas. Lionfish presence/absence was determined at each dive sight, along with species abundance. LDWF is working on a grant to analyze stomach contents via conventional visual methods, as well as using genetic barcoding. The project will allow DWF to see what the lionfish are preying on, and to compare methods.

The Aquatic Plant Control Program is housed within the LA LDW's Inland Fisheries Section. Aquatic plant control plans were developed for 73 different waterbodies during 2019. Giant salvinia continues to be the most problematic aquatic invasive species plant in LA. Since 2010, DWF has treated approximately 22,461 acres of giant salvinia with herbicides per year. Control methods of aquatic plants consists of chemical, physical, and biological. The annual Aquatic Plant Control Program budget is \$5,500,000, of which over 50% of that is spent on giant Salvinia alone for monitoring, treatment, and research.

To help the public contact LA DWF with ANS reports, an email contact was added: aquaticinvasives@wlf.la.gov. The email, along with the ANS Hotline, has increased ANS reports from the public to over 750 reports since the beginning of 2019.

Bobby Reed, the ANS coordinator, retired in April 2019. **Robert Bourgeois** assumed the duties for that position.

Mississippi

Freshwater report:

Dennis Riecke reported that MS DWFP staff chemically treated water hyacinth, alligatorweed, Cuban bulrush, hydrilla, and giant Salvinia at Ross Barnett Reservoir.

In September and October 2019, 200 acres of water hyacinth in Horseshoe Lake was chemically treated via aerial application, at a cost of \$16,000. A floating boom was also purchased to contain the water hyacinth.

DWFP staff attended meetings of the Mississippi Aquatic Invasive Species Council to guide implementation of the activities specified in the *Mississippi State Management Plan for Aquatic Invasive Species*. Federal ANS funding and project document were updated.

A radio show presentation was given on northern snakeheads and silver carp. An article on the life history of silver carp was written for the November-December 2019 issue of the *Mississippi Outdoors* magazine.

A document on Asian carp status in Mississippi was composed in response to a request for information from a venture capital firm.

A meeting was held with Moon River Foods personnel on harvesting Asian carp and commercial fishing regulations.

A Species Matrix was completed for a Lacey Act request from the Mississippi River Basin Panel on Aquatic Nuisance Species.

Six special permits were issued for the harvest of Asian carp at Moon Lake.

Draft aquatic plant control sheets were developed by MSU for hydrilla, giant salvinia, water hyacinth, alligatorweed, and torpedo grass.

Northern snakeheads were collected from Lake Beulah, Desoto Lake, and Horseshoe Lake. These occurrences were reported to the USGS NAS database.

Saltwater report:

Mike Pursley reported that an unusual and prolonged period of extremely low salinity in the Mississippi Sound and the lower Pascagoula River has allowed giant salvinia to establish and quickly cover bayous that have historically been too saline to support freshwater vegetation. The event was reported by the local television news. Normal salinity levels have since returned, and the formerly infested areas are rapidly recovering.

Two aerial surveys totaling 395 miles, and 65 waterway surveys totaling 504 miles were conducted for early detection of aquatic invasive species and monitoring of existing infestations.

A program of integrated pest management and spot herbicide application was used to control populations of common Salvinia, alligator weed, and water hyacinth.

Possible visual evidence of Salvinia weevil population recovery was noted during a recent aerial survey. Salvinia weevil presence has not yet been physically confirmed, but brown patches of dying giant salvinia seen in areas of remote freshwater marsh are consistent with previously observed weevil activity. This observation is the first indication of possible weevil survival since their apparent demise from cold temperatures during the winter of 2017.

During weekly control missions, 8,456 giant applesnail egg masses were destroyed, and 293 live snails were removed from the Pascagoula River. Since the snails were first observed in 2014, a total of 29,791 egg masses have been destroyed, and 1,101 live snails have been captured. Three river flooding events in 2019 have greatly increased the likelihood for expansion of this species.

North Carolina

Corrin Flora reported that they have been managing several infestations of yellow floating heart across the state. In 2018, there were five new infestations. One infestation at a koi pond was treated, and another infestation in a farm pond was treated in the Fall of 2018. Plans are being made to treat the remaining known infestations using ProcellaCOR, a new herbicide with good efficacy on floating heart. All sites will be monitored to document control efforts in 2019.

The Beach Vitex Eradication Taskforce worked to eradicate and control beach vitex from 2006 – 2009. They made a lot of progress on getting landowners, towns, and cities to allow for the removal of the plant from dunes and shorelines in North and South Carolina. The NCDA was notified in the summer of 2018 that there was a large infestation of beach vitex in Morehead City. A site visit was made, and letters were sent from the NCDA to each home owner in the general vicinity of the infestation to alert them to the infestation, and to request signed permission letters for access to their land. An herbicide treatment was done to the largest section of beach vitex in November 2018. Monitoring and eradication efforts will be ongoing in 2019. NCDA has been notified of several other patchy infestations in areas along the NC beach. One infestation will likely be treated by NC State Parks. The other infestations will be checked out, and control efforts discussed.

The 2019 work plan for the Aquatic Weed Control Program includes over 60 projects across the state. Total funding is approximately \$850,000.

For the sixth consecutive year, Lake Waccamaw received a large-scale herbicide treatment of fluridone. Hydrilla growth has been completely suppressed by the treatments, and there is no evidence that new tuber production has occurred since treatment began. An intensive soil sampling effort was performed in the spring of 2017 to determine the presence and density of tubers. A total of 2,755 sediment cores were processed. Two cores each contained a single tuber. That survey led to a decreased target area in 2018, so less fluridone was applied relative to the previous annual treatments from 2013-2017.

A large section of the Eno River was treated with fluridone in 2015 and 2016 to control hydrilla. The treatment was expanded to approximately 22 miles in 2017, and a repeat of the treatment was done in 2018. The 2018 treatment spanned from June 30 - August 15th. Four consecutive years of treatment has resulted with significant control of hydrilla growth, with minimal to no impact to non-target plant and animal species. The project is managed by the Eno River Hydrilla Management Task Force, a partnership of local state and federal government agencies, academia and, non-profit organizations.

Lake Norman is experiencing a second round of hydrilla. The first infestation of the lake was in 2002. An aggressive grass carp release quickly reversed the hydrilla, and by 2004, complete suppression was achieved. In 2017, hydrilla showed up in a different part of the lake. A quick survey by Duke Energy in the fall of 2017 was conducted, and estimated approximately 500 acres of hydrilla, isolated to one area of the lake. The epicenter of the new outbreak is a high-volume public boat access area. A release of 10,200 grass carp was done in spring 2018. Hydrilla is impacting multiple marinas.

Efforts continue with the Southeastern Cooperative Fish Parasite and Disease Laboratory at Auburn University on a multi-year effort to increase understanding of *Myxobolus cerebralis* (the

causative agent of whirling disease) distribution and ecology in NC. In 2018, 1,828 fish from 71 sites were collected for evaluation.

Efforts continue with SC FPD to explore spatial distribution and life history characteristics of gill lice. Copepod collections occurred at nine sites in 2018. Additional research will continue through 2020.

In 2018, Tennessee Tech University initiated a regional-scale assessment to define the current distribution of didymo in western North Carolina. TTU identified didymo cells within Tuckaseegee River in 2015. Since that initial collection, little information has been obtained on the diatom in the state. This multi-year effort will establish a baseline for didymo distribution.

A Catfish Management Plan has been developed, and finished public comment on April 3, 2019. The Plan updates the Commission's 2007 Catfish Management Plan. The Plan discusses the challenges and ecological impacts of non-native catfish introductions, and identifies measures for conserving native catfish populations.

In 2018, DMF received four reports of Asian tiger shrimp. It appears that tiger shrimp were abundant in NC in 2018. All reports were confirmed by photo or specimen. One fisherman brought four tiger shrimp to DMF staff, and stated he caught 10 tiger shrimp so far this year. In 2012, tiger shrimp was added as a code in the DMF state trip ticket program. Since then, annual landings have ranged between 5 and 25 pounds. There is limited commercial fishermen participation in landings.

The range of blue catfish in North Carolina has been expanding over the years, and commercial landings have increased. They have been caught across all of Albemarle Sound and its tributaries, and are expanding into the Pamlico Sound region. The North Carolina Wildlife Federation is concerned with expansion in North Carolina, especially into the lower Pamlico and Neuse Rivers. The Wildlife Federation is looking at ways to expand commercial fishing for the catfish in that region. The NC DMF has partnered with SeaGrant and NC Wildlife Resource Commission in monitoring blue catfish in the state.

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 the Carolina madtom. Recent analysis shows that the Carolina madtom is below detectability levels in areas with known flathead catfish populations. Intensive surveys and management actions, including removal, may be needed in the near future to prevent Carolina madtoms from going extinct. The US Fish and Wildlife Service Sport Fish Restoration Grant has funded a non-native catfish project in the Cape Fear that began in 2017. The study will look at habitat and prey selection of flathead catfish.

The North Carolina Aquatic Nuisance Species Management Plan was drafted in 2014-2015. At the time, there was no plan for submission to the national ANS Task Force for review/approval. The steering committee that authored the plan reconvened in July 2018. The document is being reviewed/edited. The group intends to gain support from state agencies, and ultimately have the Governor submit it to the ANSTF.

South Carolina

Peter Kingsley-Smith reported that the red swamp crayfish, *Procambarus clarkii*, is now well established in many areas worldwide, including South Carolina, due to numerous aquaculture

ponds and culinary activities. They are native to the southern Mississippi River drainage, to Illinois and the Gulf coastal plain, from the Florida panhandle to Mexico. When introduced to an area, they can alter structural and functional components of freshwater ecosystems, and in some cases, fundamentally alter the nature of the ecosystem they invade. SCDNR staff have identified several populations in the Pee Dee River and Waccamaw River drainages in South Carolina that had not been previously reported, which indicates that this species may be spreading into new areas of the state. Some of these populations overlap with known populations of South Carolina State Wildlife Action Plan (SWAP) Priority crayfish species, including the Waccamaw crayfish, a Priority I species that has only been documented in a few locations in the state. The SC DNR Crustacean Research and Monitoring Section (CRMS) is currently working on several projects to better understand the recent spread of *P. clarkii* in SC, its mechanisms of dispersal in the Pee Dee River and Waccamaw River drainages, and its potential impacts on native crayfish. The projects are funded by the USFWS State and Interstate Aquatic Nuisance Species Management Plan Program and the USFWS State Wildlife Grant Program.

In July, September, and October 2019, SC DNR biologists surveyed for *P. clarkii* in the Pee Dee River watershed. In April, May, June, and October 2019, they surveyed in the Waccamaw River watershed. A total of 30 locations were sampled, and at least six different species of crayfish were collected. The invasive red swamp crayfish was recorded at 19 of these sites. A total of 198 individuals were collected. Other species collected included two conservation priority species - Carolina sandhills crayfish and Waccamaw crayfish. Species-specific microsatellite markers are currently being developed and optimized by SC DNR researchers to assess the mechanisms of dispersal of *P. clarkii* in the Pee Dee River and Waccamaw River drainages. Funding was provided by the USFWS State Wildlife Grant Program. These microsatellite markers will be used to determine population genetic structure among populations of *P. clarkii* within these drainages.

Between April and November 2019, sites in Charleston County were surveyed by SC DNR researchers. The invasive red swamp crayfish was documented at 26 locations in the greater Charleston area. During these surveys, at least six species were documented, including the conservation priority species Santee crayfish, coastal plain crayfish, and cedar creek crayfish. Additionally, numerous *Procambarus troglodytes*, the native sister species to *P. clarkii*, was documented from many of these sites.

Opportunistic sampling outside of Charleston County has also yielded additional locations for *P. clarkii*. Additional specimens were collected at various points along the Edisto River. Specimens were also found upriver in the Ashley River, the Santee River, and the Pocotaligo River, which suggests that *P. clarkii* inhabits each of these watersheds. Between April and November 2019, 1,424 *P. clarkii* specimens were collected.

The rusty crayfish and the virile crayfish are also invasive species of concern in South Carolina. The rusty crayfish is currently established in North Carolina in the Broad River watershed. The virile crayfish was documented in the Catawba River by SC DNR biologists last year. With funding from the USFWS State and Interstate Aquatic Nuisance Species Management Plan Program, SC DNR researchers surveyed locations in the Broad River and Catawba River in SC for rusty crayfish and virile crayfish. In August, September, and October 2019, mainstream and tributary systems were sampled. No rusty crayfish were collected. In July 2018, virile crayfish were collected from the Catawba River at the Catawba Indian Reservation by SC DNR researchers. In August 2019, virile crayfish were collected from Lansford Canal State Park by

SC DNR researchers. This site is 17 km downstream from the previous known location for virile crayfish in the Catawba Indian Reservation. Native *Cambarus* species were documented from seven locations in the Catawba River system, and nine locations in the Broad River system.

Hybridization is common among some genera of crayfish, but there is currently little data available for wild hybridization within the *Procambarus* genus. To assess the potential hybridization of two closely related crayfish, *P. troglodytes* and *P. clarkii*, microsatellite markers that are currently being developed by the SCDNR Population Genetics Research Section for *P. clarkii* will be used to genotype both species and any potential hybrids collected. The resulting genotypes will be estimated and visualized for potential shared ancestry that would be expected if hybridization is occurring between the two species. So far, nine microsatellite markers have been optimized for amplification in *P. clarkii*. SC DNR researchers are continuing to screen additional primer pairs for reliable amplification. After reaching the goal of 16-18 markers for *P. clarkii*, the research team will screen samples from *P. troglodytes* for reliable amplification. Markers that amplify in both species will be used for the final hybridization analyses.

The white spot syndrome virus (WSSV) infects many crustacean species, and is highly pathogenic. It was recently associated with wild and farmed *P. clarkii* in Louisiana. Louisiana exports a considerable number of live *P. clarkii* to South Carolina, so the potential presence of WSSV in the specimens raises concerns that this virus could infect native crustacean species. This includes white shrimp and blue crab that inhabit nearby brackish waters. They are known to be susceptible to the impacts of the disease. To determine if *P. clarkii* is a vector for the WSSV, SC DNR Population Genetics Research Section researchers are modifying and optimizing methods from Blaylock *et al.* (2019) for qPCR detection of the WSSV by the SC DNR Genetics Research Section. The research team has ordered, and are receiving the primers and hydrolysis probe for the WSSV assay. Molecular optimization on known samples with WSSV will proceed after all primers and probes are received. The results for the study will be in presence/absence form for all individuals that are screened. Crayfish collections are ongoing. Sampling locations will focus on areas near brackish water habitats, where shrimp and blue crabs would have a higher likelihood of being exposed if the virus is present.

The invasive island apple snail is currently established in several states, including South Carolina. Recent research conducted at the SC DNR to investigate the salinity tolerance of newly hatched *P. maculata* produced by adults collected from wild SC populations indicates an ability to tolerate salinities as high as 8psu which are representative of upstream estuarine habitats in SC. There is a well-established population in a suburban neighborhood in West Ashley within the stormwater retention ponds at the Village Green residential development, located less than 3km from the Ashley River. In order to determine the distribution and potential spread within this suburban neighborhood, SC DNR biologists surveyed 28 ponds and one seasonally-flooded forested wetland in West Ashley in October and November 2018, and the 28 ponds again in July 2019. During the summer 2019 survey, *P. maculata* were present in 25 of the ponds, and 1,452 adults and 2,721 egg clutches were counted across the ponds. Four of the ponds that showed no evidence of establishment in 2018 contained between one and six egg clutches in the July 2019 survey; however, no live island apple snails were observed in the four ponds. These results suggest that *P. maculata* has short-distance dispersal capabilities across waterways that contain no surface water connection at mean water levels. Additional surveys were conducted in October 2019 and will continue into November 2019 to assess the same West Ashley population, as well as potential spread to surrounding neighborhoods and wetland areas. During the fall 2019 surveys conducted in nearby neighborhoods, an additional population of *P. maculata* was

observed in one of six ponds surveyed. Several wetland areas between the West Ashley neighborhood and the Ashley River were also surveyed, and no additional *P. maculata* populations were observed. Researchers have been active in disseminating their research in peer review journals.

In the Savannah River Basin, the redeye bass, also known as Bartram's bass, is one of three priority species included in the National Fish and Wildlife Foundation's Native Black Bass Initiative, and a species of highest concern in SC DNR's State Wildlife Action Plan (SWAP). This listing is primarily due to effects of hybridization with the Alabama bass, which was introduced into the reservoir systems in the Savannah River Basin in the 1980s. Since then, hybridization between the two species in the reservoirs has been documented in the field, and confirmed by genetic analysis. SC DNR researchers have captured Alabama bass and hybrid individuals in riverine habitats upstream of the reservoirs, while pure Bartram's bass individuals are increasingly confined to smaller rivers. Previous work by the SC DNR has documented that Bartram's bass populations are diminishing due to introgression with Alabama bass, but the extent of the progression in tributary streams is uncertain. Preliminary assessments of Bartram's bass individuals and egg samples have been conducted to confirm species identity and the extent of hybridization of Bartram's bass with closely related shoal bass species throughout the range in the upper Savannah River Basin using probe-based quantitative PCR. This approach suggests that while it is feasible to distinguish pure Bartram's bass from hybrids with a high degree of confidence, researchers may not be able to distinguish among other possible closely related introduced black bass species hybridizing with Bartram's bass. For the project, SC DNR researchers have developed a microsatellite-based genetic tool to investigate hybridization in black bass populations (specifically Bartram's bass) in the Savannah River basin. Researchers in the SC DNR Marine Resources Research Institute (MRRI's) Population Genetics Research Section have completed the optimization of the microsatellite marker suite, and have made substantial progress on the sample genotyping. All tissue samples of suspected Bartram's bass collected to date have been genotyped with this optimized microsatellite marker suite. Samples with 10 or more loci scored were included for analysis and compared to a reference set of known closely related and potentially co-occurring species in the Savannah River basin. The Bayesian clustering program STRUCTURE was deployed for species identification and to estimate the amount of mixed ancestry in each individual field sample. Genetic results indicated that approximately three quarters of the fish collected were predominantly Bartram's bass, and nearly 90% of these could be considered "pure" Bartram's bass. Future work will integrate the results of individual fish ancestry with location and local conditions to identify possible refugia for Bartram's bass and the spatial range and temporal frequency of hybridization events.

Researchers at the SC DNR Marine Resources Research Institute (MRRI) remain interested in understanding the invasion of the South Atlantic Bight and Gulf of Mexico by the Asian tiger shrimp. The total number reported in SC is currently 468, with a size range of 58 to 330 mm TL. Although reports have declined in recent years, it is likely that a portion of the shrimp collected may be kept for consumption instead.

The Cuban treefrog, native to Cuba, the Bahamas, and the Cayman Islands, has been reported from 17 U.S. states, as well as from Puerto Rico and the Virgin Islands. There are established populations throughout Florida, the east coast to Savannah, GA, and along the Florida panhandle to New Orleans, LA. There are additional populations in Hawaii, St. John, and Puerto Rico. Cuban treefrogs are likely introduced by hitchhiking on plants or other materials being transported, as well as attaching directly to vehicles. They are considered to be invasive because

of its adaptable diet and high fecundity. They will consume native treefrogs. The first confirmed report of a Cuban treefrog in SC was received in May 2019 via the USGS's Non-Indigenous Species Database. Three specimens were reported from Bluffton, SC in May 2019 by a citizen scientist. Researchers at the SC DNR Marine Resources Research Institute received a report of a Cuban treefrog in Mount Pleasant, SC, observed in September 2019, which represents a significant northward expansion of this species in the region. This most recent report appears to be associated with landscaping activities, as the person who reported the frog has a neighbor who recently had palm trees planted. While well established in Florida, reports of this species north of Florida on the East coast were scarce until recently. A number of new USGS alerts for this species were released in October 2019 for locations in Georgia. This northward potential expansion into Georgia and SC is of concern, due to the ability of these frogs to displace native treefrog species via direct consumption. Addressing the vectors and pathways resulting in these new introductions will be critical as part of efforts to control the spread of Cuban treefrogs in the southeastern U.S.

The SC DNR released an official statement in October 2019 warning anglers that if the invasive northern snakehead is caught in SC, anglers should kill it immediately and not release it back into the water. This notification came in response to the first report of this species in the state of Georgia during October. Northern snakehead have not been reported from SC, but there are now reports of the species in North Carolina and Georgia, further raising concerns that the first report of northern snakehead from SC may be a matter of when and not if.

A report of a collection of an Indo-Pacific swimming crab in Capers Creek, SC in October 2019 was received through iNaturalist. Indo-Pacific swimming crab was introduced to the eastern Mediterranean Sea beginning in Israel in the 1920s. In the Western Atlantic, it was first reported in Folly Creek, near Charleston, SC in 1986. This specimen, collected in association with a SC DNR clam farm, is in the possession of SC DNR's Southeast Regional Taxonomic Center (SERTC). This species now ranges from south of Cape Hatteras, NC to Florianopolis, Brazil.

Chris Page reported that a *Salvinia* infestation was found in Santee Cooper Lake in summer 2018. It was treated, and some progress was made, but a new surge appeared.

Maintenance stocking of carp are keeping hydrilla under control. The ratio is one triploid carp per five surface acres of water for maintenance control in ponds. It has been determined that technically, it is important to have different age classes so that maximum consumption of hydrilla is achieved.

Texas

Monica McGarrity reported that a significant prevention accomplishment was the development and implementation of a boater survey designed to assess knowledge of aquatic invasive species, reported clean, drain, dry (CDD) behaviors, motivations for CDD efforts, and exposure/response to the Texas Parks & Wildlife Department (TPWD) AIS prevention campaign. The survey was emailed to 18,108 randomly-selected registered boaters. The survey had a final "served to completion" rate of 5.3%: 25% took the survey, but only 5.3% (966) qualified to complete the survey in full by using a motorized watercraft on at least one of 43 listed lakes with AIS, and more than one water body in the past 18 months. Most boaters (86-87%) reported always cleaning, draining, and drying their boats for more than a week before visiting another lake to stop the spread of aquatic invasive species; however, 62% of boaters using lakes with zebra mussels reported not knowing or being unsure whether the lake had zebra mussels, and those

who rarely to never clean, drain, and dry their boats were less likely to know. Over half of surveyed boaters (57%) felt they had little or no personal control over the spread of AIS, with most of these individuals (91%) attributing this to a lack of control over the actions of others. The survey and results are available upon request.

Zebra mussel early detection, population monitoring, and prevention continue to be among TPWD's top priorities. A coalition of partner agencies monitors approximately 50 water bodies for zebra mussel early detection or population monitoring. Texas' prevention efforts focus on a targeted "Protect the Lakes You Love" public awareness campaign that aims to reach boaters at highest risk for transporting aquatic invasive species. The campaign focuses on motivating boaters to clean, drain, and dry their boat, trailer, and gear before traveling from lake to lake. Approximately \$420,000 was spent on paid media between Memorial Day and Labor Day in 2019, when most boaters are on the water. The paid media included 58 billboards, gas pump topper advertising at 170 gas stations, gas station TV advertising at 90 stations, geo-targeted and contextually-targeted digital banner ads and pre-roll video ads, paid social media ads on Facebook and Instagram, and digital radio ads on Pandora. The campaign also employed tactics such as email blasts and renewal mailing inserts to reach registered boaters, boat ramp signage, print ads and editorials in relevant publications, outreach materials, and organic social media.

TPWD has focused on rapid response and eradication of newly detected giant *Salvinia* introductions. In the past year, there has been successful eradication of giant *Salvinia* from Lake Athens and Lake Fork, using installation of floating booms for containment, and herbicide treatments. Booms and herbicide treatments were also used at Brandy Branch Reservoir, Timpson Reservoir, and Martin Creek Reservoir, and giant *Salvinia* has not been detected in several months. Weevils and floating boom deployment for containment and herbicide application continues to play a key role in TPWD's integrated pest management strategy. The weevils have been successful in numerous water bodies in the Carthage area, south along the LA border, to the coast; however, highly-infested Caddo Lake and northernmost areas of this range and farther north are below the lower temperature tolerance of the weevils, which results in limited success.

Watershed-scale efforts to manage riparian invasive plants continue to focus on saltcedar and arundo (river cane, carrizo cane) in key Native Fish Conservation Areas. The Healthy Creeks Initiative, a TPWD-led partnership with river authorities, local governments, NGOs, and landowners, implemented treatment of arundo on 170 properties across four watersheds in the Hill Country of Central Texas. In the Upper Brazos River watershed in the Rolling Plains and Cross Timbers and Prairies ecoregions of North-Central Texas, saltcedar management efforts continued to expand, with an additional 3,350 acres treated across 40 new properties.

Four AIS research projects were selected for funding by TPWD for fiscal years 2020-2021 through an open request for proposals.

Management of giant *Salvinia* and other aquatic invasive plants remains a top priority. Extensive management of giant *Salvinia* using herbicides and biological weevils will focus on Caddo Lake and Toledo Bend Reservoir. Investigations of herbicide efficacy will also continue.

The outreach campaign will continue to focus on zebra mussels and giant *Salvinia*. Increased focus on, and investment in, giant *Salvinia* messaging is under consideration. Additional analysis of survey results is planned to aid in guiding campaign directions and messaging.

Riparian invasive plant management efforts will continue to primarily address saltcedar and Arundo. Efforts will be expanded to include more TPWD River Access and Conservation Area, Landowner Incentive Program, and Texas Paddling Trail access locations.

Leslie Hartman reported that a new program being developed is using 10% of their personnel, so invasive species are on hold. Funding has been received from the legislature, which has been used for a “Don’t Let Your Pets Become Pests” social media presence.

University/Research

Robert McMahon reported that he is working with a colleague in Belton, TX on a zebra mussel infestation in Belton Lake. In spring 2016-2017, Belton Lake had the third highest water level in its history. New mussels from the spring spawning settled above the conservation pool, which was rapidly drawn back down later. This allowed staff to go onto the shore and collect dead mussels exposed to air. Their densities and sizes were examined. Some of the mussels reached maximum sizes over 7mm in 52 days. They start to mature at 5mm. Belton Lake is the most southern lake that mussel ecology has ever been studied in. There is a cessation of breeding/settlement when it gets very warm in the summer, but picks back up in the fall. There are two reproductive periods – spring reproductive period, when mussels are participating in the fall reproduction, and the fall reproductive period, when mussels are participating in the spring reproduction. This results in an explosive invasion of lakes. This creates a problem for water users, who cannot get things in place to control mussels fouling their plant. Plans must be put into place on how mussels will be controlled, before an invasion occurs. The paper is almost complete for submission.

There has been a long-term study on zebra mussels in Lake Ray Roberts, Lake Texoma, and Belton Lake that started in 2011 (Lake Texoma) and 2013 (Lake Ray Roberts and Belton Lake). A graduate student that **Robert** is working with is finishing a paper on the study, and it will be finalized by next semester. When the paper is submitted and accepted by their library, it can be downloaded from the library. **Robert** will provide the URL.

Region 4 USFWS/Small Grants Program

Cindy Williams reported that the USFWS National Wildlife Refuge System is concerned about Cuban tree frogs, but the USFWS does not think they are “aquatic” enough to spend fish and aquatic conservation funds to do anything with Cuban tree frogs; however, Cindy told the Panel members not to be dissuaded from implementing their own state invasive species management plans however they wish.

Cindy has been contacted for several years by the Steve and Marjorie Harvey Foundation to do an education outreach program with their boys mentoring camp in Georgia. Over 200 inner-city at-risk youth between the ages of 13 and 18 attend the camp. One of the activities is teaching the boys how to catch and clean fish. USFWS participated in the camp, stocked a pond with fish, and staff did the teaching. There were also three other stations: aquatic invasive species, careers, and aquatic ecology. USFWS has now been asked to do a girls mentoring camp. The camp is held in June.

James Ballard stated that the Traveling Trunk, which began in 2012, is still being used heavily.

GSMFC is supporting efforts to get lionfish removed from Mississippi waters, and **James** works with sponsors to provide prizes to divers for capturing lionfish, which are turned into DMR so data can be obtained. Numbers are very low in Mississippi, but efforts are being expanded into Louisiana and Texas.

MS/AL Sea Grant

Kristina Alexander reported that they received a grant to do research to develop model bait fish regulations. She has been reviewing state law and regulations pertaining to invasive species, and also is looking at plant pests and nuisance species. She has hired an intern to help in spring 2020, and ideas will be presented at the next meeting.

USACE

Jon Lane reported that the USACE published a paper on the difference between name brand and generic brands of herbicides used for floating plant control. Glyphosate, Diquat, Triclopyr, and 2,4-D were all tested. Results showed that there was no difference between name brands and generic brands.

USACE's dredging equipment, mowers, and maintenance equipment used on DMMA's by contractors have been found to spread invasive plants. In Florida, they found that old world climbing fern was being spread via mowing equipment. Since then, all maintenance equipment must be cleaned after use. The dredgers must also be cleaned after use. The USACE aquatic plant control kochia program is receiving funding for wash stations. The USACE is building the wash stations, and doing a 50/50 cost share with the western states for operations and maintenance on them. The funding amount is currently \$10M. Congress recently authorized the program funding to be increased to \$110M.

NOAA

Tom Jackson reported that NOAA has been cooperating with the removal of mangrove *Lumnitzera* in the southeast and a number of other invasive plants in the area. After Hurricane Irma, they removed over 350 Brazilian peppers and Australian pine trees, and then replanted natives along the living shoreline. Since then, however, the shoreline is rapidly eroding.

Presentation of the GSARP Distinguished Achievement Award

The GSARP Distinguished Achievement Award was presented to **Pam Fuller** in appreciation for her outstanding contributions to the field of aquatic invasive species in the Gulf and South Atlantic Region, and her efforts in creating the National Aquatic Species Database.

Election of Officers

Peter Kingsley Smith was elected as Chairman.

Dennis Riecke was elected as Vice President.

Other Business

James Ballard reported on panel membership status. He asked the panel members if there were any other federal agency seats on the panel that need to be filled. He can bring the matter up at the next Task Force meeting, and then get letters sent out. USDA, Naval, FDA, and Coast Guard seats are vacant. EPA might also be added. James stated that all 13 federal agencies that sit on the Task Force could be represented on the regional panels. **Cindy Williams** suggested APHIS. James will look into the USDA and Coast Guard seats. **Tom Jackson** is retiring in 2021, so the NOAA seat will be available. He will give James NOAA contact information to look into

someone to fill the seat. The Ports and Harbor seat is available, if needed. James said that the membership status can further be discussed on the panel conference call on February 27th.

A Motion was made to have Craig van der Heiden, Miccosukee Tribe of Indians, fill the Tribal seat on the GSARP. The Motion was seconded, and the Motion passed.

Peter made a Motion that Michael Kendrick, SC DNR, be added as a second Research seat on the GSARP. The Motion was seconded, and the Motion passed; however, **Leslie Hartman** pointed out that historically, when researchers were on the panel, their resumes were first submitted for review, and an official decision was made after that. **Peter** will send Michael's resume to **James**. The panel members will also submit resumes for other potential nominees for the Research seat to **James** by December 15th. He will distribute them to the panel members for review. If there are no other nominees for the seat, the vote for Michael will proceed as stands. **Kristina Alexander made a Motion to amend the original Motion, to reflect Leslie's points. The panel members will submit resumes for other potential nominees for the Research seat to James by December 15th. The Motion was seconded, and the Motion passed.** This nomination will be discussed on the next GSARP conference call. **James** asked the panel members to also send him resumes for nominees for other vacant seats on the panel. This will also be discussed on the conference call.

Peter Kingsley-Smith suggested that state reports no longer be printed out for the GSARP meetings, in the interest of reducing paper waste associated with Panel meetings, since the reports are emailed to the panel members prior to the meeting, and several Panel members bring reports with them to the meetings digitally on their laptops.

Next Meeting Time and Place

Suggestion for the locations of the next meeting in Alabama were Gulf Shores State Park or Mobile.

The dates will be April 21-22, 2020.

Public Comment

The Chairman 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.

Action Items

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James Ballard will send the GSARP Research Priorities list to the review committee, and then go over the drafts at the panel mid-meeting conference call.

James Ballard will look into developing a new page on the GSARP website to display a list of the funded projects under the small grants program, and their final reports.

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Robert McMahon will provide the URL for a published paper that was done on a study of zebra mussels in Lake Ray Roberts, Lake Texoma, and Belton Lake.

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Peter Kingsley Smith was elected Chairman of the GSARP.

Dennis Riecke was elected Vice Chairman of the GSARP.

James Ballard will explore filling the USDA and Coast Guard seats for the panel.

Tom Jackson will give James NOAA contact information to look into someone to fill the NOAA seat when he retires in 2021.

James stated that panel membership status will be discussed on the GSARP panel conference call on February 27, 2020.

Peter Kingsley Smith will send Michael Kendrick's resume, and panel members will send other nominee resumes to James for the vacant Research seat by December 15, 2019. He will distribute the resumes to the panel members for review. The nominations will be discussed on the panel conference call on February 27, 2020.

James asked the panel members to send him resumes for other nominees for other vacant seats on the panel. This will be discussed on the panel conference call on February 27, 2020.

It was suggested that state reports no longer be printed out for the GSARP meetings, since the reports are emailed to the panel members prior to the meeting.

Motions

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A Motion was made to approve a recommendation made by **Dennis Riecke** that the Task Force ask the USFWS to explore the current process the USDA uses for importing produce, etc. into the U.S., for possible applications for aquatic animal trade, pet trade, and all aquatics. The Motion was seconded, and the Motion passed.

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A Motion was made to have **Craig van der Heiden** of the Miccosukee Tribe of Indians fill the Tribal seat on the GSARP. The Motion was seconded, and the Motion passed.

Kristina Alexander made a Motion to amend **Peter Kingsley Smith's** original Motion to add Michael Kendrick as a second Research seat on the GSARP. The panel members will first submit resumes to **James Ballard** by December 15, 2019 for other potential nominees for the Research seat. The Motion was seconded, and the Motion passed.