

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

**Wednesday, April 17, 2019 – Thursday, April 18, 2019  
Ft. Lauderdale, FL**

On Wednesday, April 17, 2019, Chairman **Lisa Gonzalez** called the meeting to order at 8:00 a.m. The meeting began with introductions of the members and guests. The following were in attendance:

**Members & Proxies**

Kristina Alexander, MS/AL Sea Grant, Oxford, MS  
James Ballard, GSMFC, Ocean Springs, MS  
Paul Carangelo, Port of Corpus Christi Authority, Corpus Christi, TX  
Corrin Flora, NC DEQ, Raleigh, NC  
Lisa Gonzalez, HARC, The Woodlands, TX  
Leslie Hartman, TPWD, Palacios, TX  
Tom Jackson, NOAA, Miami, FL  
Chuck Jacoby, St. John's River Water Mgt. District, Palatka, FL  
Peter Kingsley-Smith, SC DNR, Charleston, SC  
David Knott, At-Large Member, Charleston, SC  
Jon Lane, USACE, Jacksonville, FL  
Robert McMahan, UT Arlington, Arlington, TX  
Jim Page, GA DNR, Waycross, GA  
Michael Pursley, MS DMR, Biloxi, MS  
Matt Phillips, FWC, Tallahassee, FL  
Cindy Williams, USFWS, Atlanta, GA (GoToMeeting)

**Staff**

Joe Ferrer, GSMFC, Ocean Springs, MS

**Others**

Alex Dew, FWC, Tallahassee, FL  
Bryan Falk, Everglades National Park, Homestead, FL  
Sarah Funck, FL FWCC, West Palm Beach, FL  
Kelly Gestring, FWCC, Boynton Beach, FL  
Dennis Giardina, FFWCC (GoToMeeting)  
Tyler Green, USACE, Clewiston, FL  
Jeff Hill, University of FL, Ruskin, FL  
Steve Johnson, University of FL, Gainesville, FL  
Susan Pasko, USFWS, Falls Church, VA  
Ian Pfingsten, USGS, Gainesville, FL  
Austin Prechtel, FWC, Davie, FL  
Justin Procopio, USGS, Gainesville, FL  
Christina Romagosa (GoToMeeting)  
Bill Sharp, FWC, Marathon, FL  
Ed Rudberg, CD<sup>3</sup>, General Benefit Corp., St. Paul, MN

### **Public Comment**

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

### **Adoption of Agenda**

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

### **Approval of Minutes**

The minutes of the October 30-31, 2018 GSARP meeting in San Antonio, TX were presented for approval.

**A motion was made to approve the minutes, with minor changes. The motion was seconded, and the motion passed.**

### **Local Talk – Overview of the Florida Invasive Species Program**

Sarah Funck gave a PowerPoint presentation entitled “Nonnative Fish and Wildlife in Florida”. There have been over 60,000 observations of nonnative fish and wildlife, which represents over 500 species. There have been over 530,000 lionfish removed from Florida waters.

The focal areas for the nonnative program are: Risk assessment/screening; prevention; early detection/rapid response; control and management; education and outreach; research support. Not all nonnative species are invasive. The ranking may change based on location. Feasibility of effective management is also considered. Impacts are not only environmental.

The risk assessment and screening tool action recommendation is based on the invasion assessment score and feasibility of control score.

Maxent is a software program based on the maximum-entropy approach for modeling species niches and distributions. From a set of environmental grids and geo-referenced occurrence localities, the model expresses a probability distribution where each grid cell has a predicted suitability of conditions for the species. MaxEnt was used in a risk screen case study for yellow anaconda to establish a habitat suitability model. The Invasion Assessment score and Feasibility of Control Scores were both high. The Recommended Action was to coordinate a rapid response.

There are 68 conditional species in Florida. A permit is required for importation, research, commerce, and exhibition. Personal possession is not allowed. There are over 800 prohibited species in Florida. A permit is required for importation, research, and exhibition. Commercial sales and personal possession are not allowed. FWC Commissioners approved recent rule changes for prevention of new prohibited species. Key terms were defined, high-risk species were added to the prohibited list, and grandfathering language was added for people with these species in personal possession.

The Exotic Pet Amnesty Program was created in 2006. There have been 47 events, and over 5,000 animals have been surrendered. There are 743 active adopters.

FWC has an iPhone app called “IveGot1” for identifying and reporting invasive animals and plants in Florida. Reported sightings can also be reported by calling 888-Ive-Got1, or online at

IveGot1.org. An Asian water monitor was reported in Miami-Dade County. There were no known breeding populations. The risk screening was very high. The monitor was removed within three days.

Electrofishing in south Florida was done. Bay snook and African clawed frogs were removed after pond renovations. An interagency live trapping effort in Miami-Dade County was done, and over 6,800 animals were removed. FWC has a trap loan program in Florida City and Homestead. Shooting surveys were done, and 398 black spiny-tailed iguanas have been removed since 2017. Canal surveys for Nile monitors were done by boat. Since 2011, 129 have been removed. Contractors were hired for removal of pythons. They were compensated for their survey time and number of pythons. Since 2017, 420 pythons have been removed. The Keys Green Iguana Removal focuses efforts in state parks. Over 2,300 have been removed. Python removal programs have contributed to over 8,000 Burmese pythons killed and reported to the FWC. FWC contractors can access Everglades National Park for lethal take of pythons. Firearm use is allowed.

### **Florida's EDRR Screening Tool**

Christina Romagosa gave a PowerPoint presentation entitled "Greater Everglades Rapid Response Screening Tool". The screening tool is specific to the greater Florida Everglades. It is currently being adjusted by FWC to accommodate the entire state of Florida.

Goal 1 is to prevent the introduction of invasive exotic species. Goal 2 is to eradicate invasive species by implementing Early Detection and Rapid Response (EDRR). Goal 3 is to contain the spread of invasive exotic species. Goal 4 is to reduce the populations of widely established invasive exotic species, and maintain at lowest feasible levels.

Goal 2 has two objectives: Objective 2A – Prepare and monitor to enhance early detection.

Priority Strategy 2A5: Establish rapid assessment and response programs, processes, cooperatives, and tools that allow for quick reactions for eradication.

Objective 2B – Ensure rapid assessment of new non-native species.

Priority 2B: Rapidly assess that status and potential threat of new species, and develop a response or no response plan.

There are four general stages of the EDRR process: Preparedness; Early Detection; Rapid Assessment; Rapid Response. The benefits of an established EDRR protocol are that it is cost-effective, reduces response time, and has post-border protection of natural resources.

EDRR was successful for the eradication of sacred ibis in the Greater Everglades. The sacred ibis, a large wading bird is native to parts of Africa and the Middle East. It is believed that populations in South Florida came from a breeding population that escaped the Miami Metro zoo after Hurricane Andrew in August 1992. State and federal agencies consider the sacred ibis to be a threat to native water bird populations in Florida due to its opportunistic feeding nature and ecological similarity to Florida's native ibises and native wood stork.

The Abbreviated Rapid Response Action Planning Protocol for the Everglades Cooperative Invasive Species Management Area: New Non-native Species Detected are reported to ECISMA EDRR Chairs. A joint decision is made by the EDRR Chairs to act. Action leads are determined. Rapid assessment is done. Is the action practical and likely to succeed? A response is coordinated. The decision-making process currently lacks transparency and standardization.

The Greater Everglades Ecosystem Rapid Response Screening Tool (GEERReST) is a decision support tool to ensure that decisions to act are quick, transparent, standardized, and defensible. It can be used across all agencies and cooperators, and taxonomic groups. There is a user guide, report template, and Excel calculation form. Under two sections, there are a series of questions. Invasiveness: Current distribution; invasion potential; impacts. Feasibility of control: Species/population characteristics; habitat characteristics; methodology and regulatory constraints. Each question assigned estimate of uncertainty. Uncertainty codes from Generic Nonindigenous Aquatic Organisms Risk Analysis Review Process. Meant to categorize the level of epistemic uncertainty. A score is calculated for both sections. Assessor is directed to a matrix that compares scores, and provides context for management action.

The second USGS/CES Technical Meeting will be arranged. There will be an opportunity for potential assessors to evaluate GEERReST.

EDDMapS (Early Detection & Distribution Mapping System) is used to track new invasive species. Beginning on April 17, 2018 to April 17, 2019, there were 5,022 new animal species observed (fish, amphibians, reptiles, birds, and mammals).

The future of EDRR decisions are: Need for actions, and to consider budget constraints; need for continued science, and update as new information is obtained and incorporate with existing risk assessment efforts; need to establish an EDRR protocol. Also, to continue validation, with additional testing on species with known status.

### **Risk Assessments of Lacey Act Species**

Jeff Hill gave a PowerPoint presentation entitled “Managing Injurious Wildlife after USARK vs Zinke 2017: Initial Risk Evaluation for Invasiveness to Florida of Fishes on the Injurious Wildlife List”. States have primary authority over fish and wildlife management. Federal authority includes federal lands/waters, endangered species, migratory birds, some invasive species, and interstate commerce. The Lacey Act is a federal law that was first introduced by Iowa Congressman John Lacey in the House of Representatives in the spring of 1900. It was signed into law by President William McKinley on May 25, 1900. The Act prohibits the importation into the United States and any shipment between the United States, the District of Columbia, Hawaii, the Commonwealth of Puerto Rico, or any possession of the United States.

Title 16 of the Lacey Act covers the wildlife trafficking provision. Title 16 prohibits the import, export, transport, sale, receipt, acquisition, or purchase of any fish or wildlife that was taken, possessed, transported, or sold in violation of any law or regulation of any state, tribal, or foreign law, and includes plants.

Title 18 of the Lacey Act covers the injurious wildlife provision. Under Title 18, the importation into the United States and any shipment between the United States, the District of Columbia, Hawaii, the Commonwealth of Puerto Rico, or any possession of the United States of animal species determined to be injurious by the Secretary of the Interior is prohibited except by permit. Injurious wildlife are described as “injurious to human beings, to the interests of agriculture, horticulture, forestry, or to wildlife or wildlife resources of the United States”. This includes wild mammals, wild birds, reptiles and amphibians, fish, and mollusks and crustaceans.

In 2013, the United States Association of Reptile Keepers (USARK) filed a lawsuit – (United States Association of Reptile Keepers, Inc. vs the Honorable Sally Jewell and the United States Fish and Wildlife Service) that challenged the final rule *Injurious Wildlife Species; Listing Three Python Species and One Anaconda Species as Injurious*, which was promulgated by Defendants the Honorable Secretary Sally Jewell and the United States Fish and Wildlife Service on January 23, 2012. They argued that the Service lacks authority under the Lacey Act to prohibit transportation of the listed species between the 49 continental States. On March 10, 2015, the Fish and Wildlife Service issued a rule designating four additional species of snakes as injurious. An application for a temporary restraining order was filed by USARK seeking to prohibit the 2015 rule from going into effect. The district court converted USARK’s application for a temporary restraining order into a motion for a preliminary injunction. On the merits, the court concluded that the shipment clause does not reach shipments between the 49 continental States, such that the Service lacks authority to bar transport of the designated snakes between those States. The district court therefore granted a preliminary injunction, and the USFWS appealed. An appeal was filed in the United States Court of Appeals - United States Association of Reptile Keepers, Inc., vs Honorable Ryan Zinke, and United States Fish and Wildlife Service. The injunction was upheld. The district court’s judgment was affirmed and held “as a matter of law that the government lacks the authority under the shipment clause to prohibit shipments of injurious species between the continental states”.

Recommendations for states: Adopt risk assessment tools to aid decision making and risk management; Assess risks of current injurious species if not already prohibited; assess risks of future injurious species rather than automatically harmonize; foster current and new partnerships, especially for cross-boundary issues.

Hill spoke on the Fish Invasiveness Scoring Kit (FISK). It was developed in the United Kingdom as a screening tool to assess potential invasiveness of non-native freshwater fishes. Upgrades (FISK v2) were completed to ensure the incorporation of broader climatic zones for its application to the sub-tropical climate of peninsular Florida. The FISK is a spreadsheet-based, semi-quantitative model that scores fish species based on the responses to 49 questions. Categories include biogeography, biology, ecology, and presence/absence of “undesirable” traits. The total score (ranging from -11 to 54) for the assessed species is placed into a risk category of low, medium, or high, which are determined by scoring thresholds for each risk category. The accuracy of the current FISK questions and scoring thresholds are being tested in identifying introduced fishes in peninsular Florida as "invasive" or "non-invasive." If incorporated into the initial phase of a risk assessment, it will provide fisheries managers with necessary information to allocate resources for prevention and management of invasive fishes.

### **Overview of the Orange Cup Coral Invasion in Florida**

Bill Sharp gave a PowerPoint presentation entitled “Invasive Cup Corals: What is the Risk to Florida’s Coral Reef Ecosystem?” Cup corals are native to the tropical Indo-Pacific. They are aggressive spatial competitors, and are resilient to environmental stress. They primarily inhabit darkened recesses in reefs. They were introduced into the Caribbean in the 1940s, and are now almost circumtropical in the Gulf of Mexico, Caribbean Sea, and Brazilian coast. They are prized by marine aquarists. Florida marine life collectors have asked Florida Fish and Wildlife Conservation Commission fisheries managers to consider allowing collection. Managers asked if collecting would cause the spread of orange cup coral at existing locations and to new locations. Studies were done at the Long Key Artificial Reef to assess the effects of the removal of orange cup coral from the artificial reefs within the Florida Keys National Marine Sanctuary, and if enhanced recruitment can be detected.

The ecological risk is the potential for orange cup coral (*Tubastrea coccinea*) to outcompete native species in the shallow water natural coral reef environment. It was discovered that there are morphologically distinct polyps at the Long Key Artificial Reef. Other cup coral species have been discovered in the Atlantic – *Tubastraea taguensis* and *Tubastraea micranthus*.

Genetic evidence suggests that there are multiple species invading Florida waters. Two of the species invading Florida waters are also invading Brazilian waters. Genetically, they are either the same or very similar. They pose a risk to the coral reef ecosystem. Are *Tubastraea* largely confined to darkened crevices on artificial reefs? Has it successfully colonized the darkened recesses of natural reefs? Much of the hard surface area of reefs lies within crevices, caves, and other cavities. There is a new manipulative study in the works to see what the risk is of collecting.

### **Aquatic Nuisance Species Task Force Update**

Susan Pasko reported on the status of state ANS management plans. There are 44 approved plans - 41 state, and 3 interstate.

An ANS Task Force Meeting was held on December 12-13, 2018 at the U.S. Fish and Wildlife Service Headquarters in Falls Church, VA. Topics discussed included Injurious Wildlife Listing; Accelerated Shipping, and Arctic Invasions; Cultural Release Study; Aquatic Invasive Species Management Decision-Making. Break-out sessions were held to refine and prioritize outputs under the new Strategic Plan. Action items included comments on the ANS Task Force Report to Congress for 2016-2017 due by January 31, 2019. Goal Teams (Prevention; Early Detection/Rapid Response (EDRR); Control/Restoration; Outreach and Education; Research and Coordination) will develop a concise description of how the ANSTF will implement each of the Objectives, and identify key outputs; suggest who might be best equipped to accomplish the work; make recommendations for refinements to strategies (as required for implementation).

The next ANS Task Force Meeting will be held on May 7-9, 2019 in Lake Tahoe, CA. Topics will include: Preventing Spread of Invasive Mussels in the West; Ballast water and Biofouling Management; Updates on Asian carp, DOI, Arctic. Breakout sessions will be done to begin implementation of the Strategic Plan outputs.

The Strategic Plan for 2019-2024 has six strategic goals: Coordination; Prevention; Early Detection/Rapid Response; Control/Restoration; Research; Outreach and Education. Under each Goal, there are three Objectives that provide detail about how each goal will be accomplished. Each Objective has a list of Strategies, or specific activities that will be completed.

The Goal for Coordination is to coordinate a national ANS program for U.S. waters. The Goal for Prevention is to develop strategies to identify, assess, and manage the risk of ANS and their pathways to prevent new introductions. The Goal for EDRR is to develop strategies to inform a nationally coordinated EDRR approach. The Goal for Control and Restoration is to facilitate capabilities to control established ANS populations and restore impacted habitats. The Goal for Research is to facilitate research on ANS threats, impacts, and controls. The Goal for Outreach and Education is to conduct outreach and education to increase awareness concerning the threats of ANS.

### **Everglades Cisma Accomplishments**

Dennis Giardina gave a PowerPoint presentation entitled “15<sup>th</sup> Annual Everglades Invasive Species Summit - Cisma”. Cisma (Cooperative Invasive Species Management Area) functions with a Steering Committee, FOE, Inc. (Friends of Everglades), Operations Committee, Outreach Committee, Rapid Response Subcommittee, Plant Team, Animal Team, and Strike Team.

Cisma publishes a yearly newsletter, which they coordinate publishing of the newsletter with their Everglades Invasive Species Summit, usually in July. This year’s summit will be July 17-18, 2019 at Long Key Natural Area & Nature Center in Davie, Florida.

In April, an outreach event was created at a Florida Panthers National Hockey League game. A table was set up by Cisma to reach out to the hockey fans during intermissions. Information was provided on how to get involved, and how to get in touch with Cisma. A video was also shown. Over \$300.00 was donated by fans. The event will be held again in the future.

An outreach campaign was created to reach out to the South Florida Veterinary Medical Association. Posters with the heading, “Don’t Let it Loose” were created to hang in veterinary offices to educate clientele.

An outreach event was held at Pine Jog Elementary School during Invasive Species Awareness Week. A presentation was given to the students to educate them on the importance of controlling invasive plant species. The students also participated in a work day to remove invasive plants.

During Invasive Species Awareness Week, a work day was done at Simpson Park in Miami-Dade County to remove *licaria* saplings that were threatening native hardwood trees.

An exotic southeast Asia mangrove, *Lumnitzera*, was planted at Fairchild Tropical Botanic Gardens in Coral Gables, Florida in the early 1970s. It looks similar to native white mangroves. This Asian mangrove escaped from cultivation at Fairchild Tropical Botanic Garden into neighboring Matheson Hammock County Park. The trees had spread extensively throughout approximately 20 acres. A volunteer work day is held yearly to help remove the mangroves. In 2018, 400 seedlings and saplings were removed. Unfortunately, it will be at least a decade before

the plants can be eradicated. CISMA is doing everything possible to initiate prohibitions on the importation of mangrove species from the eastern hemisphere because it is not known which mangroves will be the next invasive plant.

The Florida Fish and Wildlife Commission began the Python Challenge to involve the public in the eradication efforts. It was somewhat successful, but there are too many pythons to totally eradicate them all. To help with the effort, FWC created a python contractor program. A large number of pythons have been removed thanks to this program. The National Parks Service and USGS have teamed up in Big Cypress to place transmitters on male pythons so that the snakes can “lead” them to other male and female pythons. USDA Wildlife Services have also placed python traps in the Everglades.

Biological control tests for invasive plants were done using parasitic mites and moths. Biological control tests are also being done on downy rosemyrtle and Brazilian pepper.

Conehead termites have been documented in Broward County, south Florida.

Due to the introduction of New Guinea and other giant hammerhead flatworms, native tree snail populations have been decimated.

FWC and the National Park Service participate in an annual/bi-annual “Fish Chat” with representatives of the Everglades CISMA, to discuss research and management activities to control aquatic invasive species within the Everglades. Activities include electro-shocking and fishing for invasive fish.

At Pinecrest Gardens in Pinecrest, Florida, staff worked with fish biologists from USGS and Florida FWCC to remove bay snook, a cichlid fish native to Central America. Bay snook were living and breeding in the lower pond system at Pinecrest Gardens, and were a potential threat to nearby Snapper Creek. After eradication of the bay snook, the pond system was re-stocked with all native fish species.

On May 26, 2019, the Friends of Everglades CISMA (FOE) held a fundraiser at the Invasive Species Brewery & Taproom in Ft. Lauderdale, Florida to support the efforts of Everglades CISMA. The funds raised went directly to invasive species management and research efforts.

### **Overview of Florida’s Invasive Plant Monitoring Program**

Alex Dew gave a PowerPoint presentation entitled “Plant Monitoring in Florida”. An aquatic invasive plant survey has been ongoing on 463 lakes and rivers and 1.26 million acres from 1982 – present. There are approximately 140 species on the survey. Spatial data for vegetation monitoring include hydro-acoustic sonar data for submerged vegetation, point-intercept species sampling, and satellite imagery models for emergent vegetation. These monitoring techniques were incorporated by FL Fish & Wildlife Research Institute in 2015 into their Long-Term Management Program. Invasive Plant Mgmt. Invasive Plant Management Section (IPM) began gathering data in the early 2000s to monitor changes in vegetation. An automated system to upload and process hydro-acoustic data was created by Biobase, a geo-spatial web platform.



In Lake Jackson, BioVolume + Point-intercept gives a good overview of submerged vegetation volume and information of species present. Information of dominant species and emergent vegetation cover is lacking, though. GPS points are collected. Dominant vegetation species classes are identified.

Uplands Invasive Plant Treatment Compliance Monitoring makes waypoints of areas to check, and inspects the contractor's tracks. There are smartphone GPS apps: Trails; Avenza; Gaia. Compliance inspection tracks and waypoints can be brought in. The contractor can see what area was checked, and where misses were found. A polygon can be drawn with instructions to return to an area. A report is filled out with details and generated. Data sets are compiled and combined. There is an interactive display. Monitoring data is made accessible. Plant monitoring data is combined with fish transect electrofishing data.

### **Invasive Lizards in Florida, With a Focus on Tegus in South Florida**

Bryan Falk gave a PowerPoint presentation entitled "Invasive Lizards in Florida" (i.e., Black & White Tegus in South Florida"). There are 180 non-native reptiles and amphibians reported in Florida. There are 63 reproducing populations. Florida has more non-native reptiles than anywhere else in the world. There are over two times as many established non-native as native lizards. The numbers of introductions and established populations are increasing.

Black and white tegus are large-bodied lizards native to South America. Tegus can live 10+ years. Their ecological impact is potentially broad. They can habitat in wild areas, or in/near human habitation. Their diet consists of animals, vegetation, fruit, and eggs. There is unregulated harvest in their native range for their skin for purses, belts, etc. The population has been monitored since the 1990s, and there is no evidence of a population decline. They were first observed in 2008 near Homestead, FL. This put Everglades National Park wildlife at risk, such as sea turtles, Cape Sable seaside sparrows, and American crocs. Also at risk are American crocs in Turkey Point and Key Largo woodrats in Key Largo. There have been interagency trapping efforts from 2012-present, using commercial traps and eggs for bait.

There are many knowledge deficits for improved control and containment, such as fecundity, juvenile survival, juvenile dispersal, and bait attraction/trap success. Telemetry was used on juvenile tegus to study containment for fecundity, dispersal, survival, and bait attraction/trap success. An external transmitter was attached with glue to the juvenile tegus. Radio tracks were done for 3-6 weeks. When the tegu sheds, the transmitter is dropped, and skin is attached. There was also glue failure, with no skin attached. Shedding rates in juvenile tegus were studied from 24 captive, PIT-tagged juveniles in an outdoor enclosure. The glue mesh and ID labels were checked daily, and re-applied two times per week. The shedding rates were studied in juvenile tegus held captive for 96 days. Growth rates were 0.23%/day (SVL) and 2.0%/day (Mass). Shedding events on average were 8.2 days (not good), with a range of 4-13 days (also not good). Shedding correlated with mass growth, but not correlated with SVL growth.

Trapping success for small tegus was studied. The smallest capture prior to 2017 = 16 cm SVL. A hatchling SVL is 8-9 cm. Traps for small tegus are needed for better management and to recapture telemetered animals. Potential issues were trip plate insensitivity, and escapement through the side mesh and gaps in the door. The traps were modified by adjusting trip-plate

sensitivity to 10g, wrapping the trap in hardware cloth, and installing dowels around the door gap. The modified traps were installed adjacent to regular traps. They were baited with chicken eggs, cat food, or visual lures. The traps were checked daily from July – October 2016. The modified traps caught small tegus, and were better at catching tegus in general. However, they did not catch the largest size classes.

Tegu baits were tested. Raw chicken eggs worked well, they are inexpensive, and suitable. Other potential baits tested were canned cat food and visual lures (feathers/sequins/plastic monofilament/alligator clamp). These were all deployed July – October. Chicken eggs were somewhat better than the cat food. Chicken eggs also catch fewer non-targets. Visual lures did not work. Fermented egg oil was also tested. It did not improve capture rates.

In Everglades National Park and Homestead/Florida City, 90 live traps, and 20 camera traps were deployed. In Everglades National Park, 11 tegus were captured in L-31W traps in 2019. In Homestead/Florida City, 11 tegus were captured in Aerojet traps in 2019, and 17 tegus were captured in C-111N traps.

A report was published in July 2018 Scientific Reports, a nature research journal, entitled “Modeling the Distributions of Tegu Lizards in Native and Potential Invasive Ranges”. The goal of the study was to identify what areas in North America might be at risk. Species distribution models were built using 5 approaches (logistic regression, multivariate adaptive regression splines, boosted regression trees, random forest, and maximum entropy) based on data from the native ranges. Environmental non-correlated variables important to tegu biology were identified. The models were then projected to North America to develop hypotheses for potential tegu distributions. Results suggested that much of the southern United States probably contains suitable habitat for tegus.

### **Apple Snail Impacts in Florida**

**Matt Phillips** gave a PowerPoint presentation entitled “Exotic Island Apple Snails and Kissimmee Grass”. Over the past several years, beds of native Kissimmee grass (*Paspalidium geminatum*) on the Kissimmee Chain of Lakes have undergone significant decline, and sometimes have disappeared. This trend is in coincidence of observations of large numbers of egg masses of island apple snails on emergent vegetation.

Experiments were conducted on aquatic plant consumption by island apple snails. In Experiment 1, four tanks were divided in half with a screen, and filled with water. Two pans of Kissimmee grass were placed at each end of the tanks. Ten island apple snails were placed in one end of each tank, separated by the screen. The experiment ran for 19 days. The grass was almost entirely consumed by the snails. They particularly liked new grass growth. Large grass stems were generally not consumed. On average, they reduced 65% of the biomass in the tanks.

In Experiment 2, the tank was not divided. Hydrilla was placed on one end, and Kissimmee grass on the other to see if the snails preferred one plant over the other. Ten snails were given free access to either of the vegetation for eight days. The Kissimmee grass was decimated by the snails.

In Experiment 3, the weight gain of the snails was studied between August and November 2017. The tank was divided with 10 snails with Kissimmee grass, and 10 snails with hydrilla. Additional plants were added as needed. The snails consumed all of the Kissimmee grass in 21 days. The weight gain was significant and comparable between the hydrilla and Kissimmee grass. The average daily weight gain for Experiment 1 was .22 grams; Experiment 2 was .16 grams; Experiment 3 was .24 grams for Kissimmee grass and .31 grams for hydrilla. It would take a native snail 110 days to gain as much weight as an island apple snail did in 28 days. No significant damage to plants by native snails has been seen, compared to the island apple snails.

Results found that the island apple snails consumed more Kissimmee grass than expected. Stems were eaten off and consumed at the surface. The snails ate the new growth. This is likely the cause of Kissimmee grass decline.

There are limited molluscicides, and they are toxic to native snails. Effects on Kissimmee grass sprouts will be studied. Tests will be done with experimental units using block nets surrounding hydrilla and Kissimmee grass.

### **The Science of Compliance: Changing Boaters' Behaviors to Reduce the Spread of AIS**

Ed Rudberg gave a PowerPoint presentation entitled “The Science of Compliance – Empowering Boaters with “The Tools”. A pilot project was done in 2017 to install Clean-Drain-Dry-Dispose (CD<sup>3</sup>) user-operated free waterless cleaning stations at five locations – Lake Minnetonka at Spring Park Bay and North Arm Bay, Pike Lake in Canosia Township, Bryant Lake in Three Rivers Park District, and Lake Riley in Eden Prairie. The stations include a wet/dry vacuum, blower, and tethered hand tools. The goal was to empower day boaters to take action to prevent the spread of aquatic invasive species. The stations were accessible 24/7.

After 310 days in the field, the five equipment stations performed without major issue. The stations were able to log use, maintenance, and functionality via the internet. The total uses for the 2017-2018 pilot were over 28,487. The software logged over 6,500 volunteer AIS prevention actions taken by boaters (approximately 2,200 watercraft). A survey of boaters was done, and the responses were very positive. People felt that it was easier to use than their hands, they like to keep their boat clean, they didn't want to spread AIS, and they would use the station again in the future. Key points from 2019 was that there was a decrease in AIS boat violations by 70%. There was no vandalism of the stations, and there was high approval from the public.

Future research will include 3<sup>rd</sup> party efficacy research; custom programs with digital kiosks, geofencing, check-in/out; installations across North America in 2019. Several new station model designs will also be created.

### **Update on New Introductions**

Ian Pflingsten gave a PowerPoint presentation entitled “Update on New Introductions”. The Nonindigenous Aquatic Species Program (NAS) is the central repository for spatially referenced accounts of introduced aquatic species. The program provides scientific reports, online/real-time queries, spatial data sets, distribution maps, and general information. The data are made available for use by biologists, interagency groups, and the general public. It is part of a national Early

Detection Rapid Response (EDRR) system. The database tracks >1,290 aquatic taxa across U.S., Alaska, Hawaii, and U.S. territories for potential introduction pathways and population status.

The Alert Risk Mapper (AMR) attempts to identify the risk of spread associated with new introductions, and provides maps as images, along with emailed alerts. The maps include current native and non-native range, waterbodies and reaches at risk of non-human-mediated introduction, barriers, and species potential mobility.

The Screen and Evaluate Invasive and Non-native Data (SEINeD) is a publicly available tool that users can upload collection data, such as species, coordinates, counties, and states. Coordinates are checked against native and non-native ranges from the NAS database. Users are returned a file with the native status for each datum, if available.

The Impacts database has documented ecological, economic, and human health impacts for over 100 priority species in the southeast region, with a quick display of the impacts by species.

NAS Alerts are generated when a species is new to one or more geographic levels in a state, country, drainage (HUC8), or county. Also, when observed within the last year.

Since November 2018, there have been two new species to state, 12 new to drainage, and four new to country. These species include seven plants, two mollusks, five fish, one herp, two crustaceans, and one cnidarian.

In the Atchafalaya Basin in Iberia County, Louisiana, a black carp was collected in March 2019.

In Tunica Lake in Tunica County, Mississippi, a black carp was collected in January 2019.

In 2018 in Miami-Dade County, Florida, a *Zanclus cornutus* (Moorish Idol) was collected on the vertical wall that forms the boundary between Biscayne National Park and the Florida Keys National Marine Sanctuary. It was first spotted in 2009, then again in 2014 and 2017. This was potentially an aquarium release.

In the Belcher Canal in Vero Beach, FL, a red-rim melania was collected in March 2019.

In a pond near Lake Cecil in Montgomery County, Texas, crested floating heart was collected in 2018. It was also collected from Lake Athens in Henderson County.

Giant salvinia was collected in February 2019 from Lake Okhissa in Franklin County, Mississippi.

In the Buddy Holly Recreation Area in Lubbock County, Texas, a red swamp crayfish was collected in August 2018.

A Northern crayfish was collected in December 2018 from the Catawba River at Catawba Indian Nation Reservation Boat Landing in York County, South Carolina.

A Cuban treefrog was collected in January 2019 in Muscogee County in Midland, Georgia on a plant in someone's yard.

### **USGS FaST System Updates**

Ian Pflingsten gave a PowerPoint presentation entitled "USGS FaST System Updates". Nonindigenous Aquatic Species Flood and Storm Tracker (NAS FaST) Maps were created to help assess transportation of nonindigenous aquatic species between drainages due to storm surge and inland flooding. As part of the EDRR system, the NAS program alerts managers of these possible new introductions. Once a species is introduced, the best chance of eradication or containment is as an incipient population.

NAS FaST Essentials are: Location of current established populations; defined area where flooding may have occurred and units within that area delineated by hydrology; measurements of flood heights; topography around drainage divides; post-storm surveys.

NAS FaST Maps have different stages for response. Stage 1 (2-4 days post-storm): Initial rapid response and the creation of a map of potential flooded HUCs. Maps will include information about NAS that could spread. Stage 2 (4-6 weeks post-storm): Follow-up assessment of drainages that had flooding conditions that could breach drainage divides from coastal storm surge or inland flooding. Stage 3 (12-18 months post-storm): Final review of which drainages were connected from flooding and any records of potential NAS transport due to coastal storm surge or inland flooding. NAS FaST Maps were created for Hurricane Lane, Hurricane Florence, Hurricane Michael, Hurricane Harvey, Hurricane Irma, Hurricane Maria, and Hurricane Nate. At Stage 1, the area of interest was defined using USGS WaterWatch data on flood and high flow conditions. The areas with streamgages or storm tide sensors at flood stage were selected. The map was created by using known locations of established or possibly established species. All surrounding hydrologic units were selected as potential areas of infestation. Storm surges of hurricanes were based on data from NOAA – storm category, direction, forward speed, initial tide level. Coastal drainages that have the potential to flood were identified. At stage 2, digital elevation model contours are utilized to find heights at drainage divides. USGS WaterWatch data of streamgages or storm tide sensors is made use of. Drainages that had flooding conditions that would also breach drainage divides are identified. At Stage 3, Post-hurricane NAS surveys or sightings to identify any species that could have been transported by flooding are reviewed. Final USGS WaterWatch data to determine which drainages were connected are utilized.

Upcoming enhancements include the addition of life history traits. The species ability to be transported in flood conditions will be assessed – salinity tolerance; ability to float (apple snails); movement of nonindigenous plants by vegetative fragmentation.

### **Region 4 USFWS/Small Grants Program**

**Cindy Williams** reported on their meeting in March 2019 with the regional invasive species coordinators. They discussed one of the seven goals in the Fish and Aquatic Conservation Program's Strategic Plan. Goal number 3 is Invasive Species. One of the objectives under the goal is the implementation of a national EDRR program. Each region coordinator was asked to give a SWOT (Strengths, Weaknesses, Opportunities, Threats) Analysis.

Arkansas established a Rapid Response & Recovery Committee, and a list is being compiled of state experts on species ID and needs for management and control. The ARG&FC participates on the MS River Basin Panel Prevention & Control Committee. ARGFC presented at an Asian Carp meeting, which was attended by Arkansas Congressional leaders. A snakehead paper presented will be published in AFS proceedings.

Georgia's State Wildlife Action Plan rates non-native invasive animals and plants a significant threat to native wildlife. The plan is a comprehensive strategy for conserving wildlife and natural habitats statewide.

The Southern Governors' Association founded in 1934 to repeal discriminatory rates for transporting goods by rails was dissolved in June 2016. Public and politicians have little interest in the aquatic biodiversity of the region. There is limited staff in field offices and staff work on aquatic invasive species, and other parts of the program. There are Fisheries Information System reporting limitations for NFHs working on aquatic invasive species. HACCP (Hazard Analysis Critical Control Point) plans need revisions and updates. **Williams** will be coordinating a HACCP training seminar in Atlanta this fall. Some states have internal budget limitations and limited ability to make a federal match.

Florida is leading other states to 'list' injurious species at the state level and prohibiting their import, export, sales, etc. Asian carp funding is being expanded to AL, KY, MS, and TN for commercial harvest of Asian carp in Tennessee, Ohio, and Cumberland rivers. Universities, aquariums, and other entities are being partnered with to improve public perception of aquatic biodiversity and aquatic invasive species threats, which leads to economic costs, loss of recreational fisheries, and ecological function. Multi-District litigation put emphasis on At-Risk Species, which increase concerns on impacts from aquatic invasive species.

USFWS is working on guidelines for reporting and documenting unknown or un-documented species. The document will be shared with biologists and others after it is finalized and approved.

Agency external affairs staff have requested that **Williams** write an article about what is going on with the invasive species program, and to include economic loss data that the agency does not have. She will use some presentations from the GSARP meeting to help gather data on other states, partners, etc.

The state invasive species grants process has not yet been approved by headquarters. There are "ball-park" numbers, but there is no budget as of yet. They are anticipating that states that have requested funds to implement their state plans will soon receive their authorization letter. **Williams** will then begin grant preparation.

The Small Grants Program will continue to receive funding from USFWS. But, with the uncertainty of the budget, etc., the exact amount of funding is not known at this time, but **Williams** believes \$100,000 – 150,000 is likely.

### **Discussion about the Panel's Website Redesign**

Joe Ferrer (GSMFC) gave a presentation of the second draft version of the GSARP website to the panel. **Ballard** asked for feedback from the panel for any changes or additions. **Gonzalez** asked what the deadline was for providing feedback. **Ballard** stated that he would like feedback by the end of April.

**Ballard** will check with the panel members annually to see if the Top 10 Problem Species have changed, so that the website can be updated.

**Gonzalez** asked if info regarding where visitors to the website are from could be tracked. Ferrer stated the new design will help with that.

**Kingsley-Smith** asked who the target audience was for the website.

**Kingsley-Smith** asked about how people initially find the GSARP website. What outside sites could post a link to the GSARP website? What the panel does should also be highlighted. **Gonzalez** suggested social media. **Ballard** stated that news alerts could be posted on the Commission's Facebook page.

**Kingsley-Smith** asked about having a small section about what "actions" people can take to help. **Ballard** stated that the recreational guidelines from the national "Stop Aquatic Hitchhikers" campaign could be placed on the website, since it covers recreational activities and what people can do to help stop the spread of invasive species.

It was suggested that the Habitattitude link could be posted in the logo section on the website, and ask Habitattitude to cross-link with GSARP.

The following action items were decided on: Review text of pages, and provide any edits, such as photos, logos, etc.; Suggestions for new pages with content, and where to place on site; Provide state's URL and logo for home page map, and link to state site/page; Review related links to ensure existing links are still relevant, group names and members are correct, provide any new links and groups as necessary; Provide documents for the library, and suggest new library sections or subfolders of existing sections and provide documents; Provide FAQ questions and answers; Provide news items (ongoing); provide events (ongoing); suggestions for site description/tagline; Provide content for award page; Review the three footer sections, and provide suggestions for replacement of existing items or delete altogether.

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

### **Thursday, April 18, 2019**

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

## **Discussion of ANSTF Recommendations**

**Ballard** asked the panel members for any recommendations to present to the Task Force. There were none. **Ballard** and **Kingsley-Smith** will be attending the upcoming Task Force meeting in Lake Tahoe. **Ballard** stated that the Task Force Strategic Plan should be finalized at the meeting, and then it will be distributed to the panels.

## **State Reports/ Members Forum**

### **Alabama**

**Rider** provided a written report for the meeting folders. Several species and/or taxa have been proposed to be added to the Alabama restricted species regulation: Any species of snakehead fish from the family *Channidae*; Zander; European Perch; Eurasian minnow; Wels catfish; Prussian catfish; Crucian carp; Any species of eel from the family *Anguillidae* not native to Alabama; Amur sleeper.

Several regulations have also been proposed. Public comment will be sought before approval. Wild Baitfish Regulation: Within the jurisdiction of the Alabama Division of Wildlife and Freshwater Fisheries, it shall be unlawful to transport any live baitfish, having been caught or harvested from streams, rivers, lakes, or public reservoirs in Alabama, away from the waters in which they are caught. Restrictions on Certain Species of Asian Carp: No person, firm, corporation, partnerships, or association shall possess, sell, offer for sale, release, or cause to be distributed within the state of Alabama any live fish of the genus *Hypophthalmichthys spp.* except for holders of valid commercial fishing licenses engaged in harvesting individuals of these species from the public waters of Alabama for sale to licensed fish dealers and/or processors and aquaculture producers holding a valid written permit issued by the Commissioner of Conservation and Natural Resources.

For the FY2019 USFWS budget for Asian carp control and management efforts in the Tennessee Cumberland River Basins, a total of \$600,000 was added. Distribution of the funding is currently being developed.

In February 2019, a crappie angler caught a 25-pound silver carp in Indian Creek, near JP Coleman State Park. During November and December 2018, MS DWFP and TN Tech University have captured and tagged 30 more silver carp from Indian Creek and Panther Creek in Pickwick Reservoir. Forty silver carp from Pickwick Reservoir have now been implanted with sonic tags.

AL DCNR fisheries biologists continue to monitor the acoustic array at Guntersville Lock and Dam for silver carp movement and passage. No tagged silver carp have been detected below or above the Guntersville Lock and Dam.

In the Tombigbee and Alabama Rivers, bighead carp continue to be collected in low numbers during targeted sampling for other species.



## **Florida**

**Funck** reported that the FWC Lionfish Control Plan was completed in March 2018, and includes background information regarding the lionfish invasion, past and current involvement of the FWC, and identified action items for the future of lionfish control in Florida.

The FWC hosted the second Lionfish Summit in Cocoa Beach, FL in October 2018. The summit was attended by 121 people, and participants were primarily affiliated with commercial industry, government, non-government organizations, research, or stakeholders.

The FWC and Fishbrain, one of the largest fish reporting apps available to anglers around the world, have partnered to use the reports as a tool to help determine the distribution of selected non-native fish species. Approximately 3,000 usable non-native fish reports have been reviewed by FWC. The most reported freshwater fish species included butterfly peacock bass, Mayan cichlid, bullseye snakehead, and Nile tilapia. The FWC received reports from 58 Florida counties, with most reports coming from Palm Beach, Broward, and Miami-Dade counties.

In November 2018, a two-day Fish Slam event was held in which 35 fishery biologists from 12 agencies used a variety of sampling methods to collect non-native fishes. The objectives of Fish Slams are to sample water bodies not normally sampled by biologists, and to determine if non-native fish populations are established or spreading. In Broward and Miami-Dade counties, 23 non-native fish species were collected from 22 sites. One team re-sampled sites that tested positive for bullseye snakehead eDNA, but none were collected or observed. No new non-native species were collected, but FWC and partners collected some unusual species, including common carp, spotfin spiny eel, and Eastern happy. Asian swamp eel were collected for the first time from the Griffin Road Canal. This canal is directly connected to Snake Creek Canal where Asian swamp eels were first discovered in Florida in 1997.

The goal of the FWC's standardized electrofishing program is to monitor native and non-native fish populations in southeast Florida urban canals. The FWC's Wildlife Impact Management Section coordinated with FWC Freshwater Fish Management staff to develop a modified sampling protocol based on their long-term monitoring program. The new protocol keeps three fixed-starting point transects that the FWC's Nonnative Fish and Wildlife Program (NFWP) has used since 1997. Additionally, three to five randomly chosen day-time transects were added to this protocol. In October and November 2018, FWC's NFWP sampled six canals using these modified protocols. Two of the canals had not been sampled in a standardized manner, so these results will serve as baseline data for future sampling efforts. The addition of new transects increased the mean number of non-native fish species collected in the four historically sampled canals by 14%, and the number of native species collected increased by 32%. In 541 daytime electrofishing pedal minutes from six study canals, 2,623 fish were collected. Spotted tilapia, Mayan cichlid, African jewelfish, and bullseye snakehead were the principal non-native fish species collected.

**Ballard** asked if FL FWC is using eDNA. Funck stated that they are using it with the bullseye snakehead - eDNA development and refinement, as well as Burmese pythons. They got a positive "hit" outside of the known breeding range for bullseye snakehead in south Florida. Shocking was done, but no physical signs of bullseye snakehead were found. They do not know

what the positive hit means. The area was only sampled once. eDNA for Burmese pythons is still in development. Water patterns are being looked at related to eDNA.

In Hillsborough County, there has been an emerging population of African clawed frogs since 2016. In September 2018, the FWC executed research contracts with the University of Florida (UF) and the University of Central Florida (UCF) to study this population. The UF's research aims to determine spatial extent of the population in Hillsborough County, determine population size in ponds, evaluate effects of trapping on population size, identify dispersal patterns, and identify thermal limits. The UCF research aims to determine how the invasion started, what genetic factors are conducive to invasion, what pathogens the African clawed frogs may harbor, and how eDNA can be used to determine occupancy. These contracts are ongoing, and scheduled for completion in June 2019.

The Florida native Dark Falseness, primarily found in estuarine areas, has recently moved inland via waterways connected to the coast, causing impacts similar to zebra mussels, which are in the same family. They have clogged numerous irrigation pipes along the west and east coast, and a fountain in Palmetto. They have been found in Lake Okeechobee on locks, and in the Suwannee River. They are difficult to eradicate. The implementation of filters that are fine enough to screen out veligers, and prevent reproduction in irrigation pipes may help control their spread.

Populations of several anguillid eel species, including the American eel, have been infected by *Anguillocoloides crassus*, a nematode that is native to Taiwan. They were first observed in wild eels in Florida in 2006 in the St. John's River, and documented in Gulf of Mexico eels in 2014. A heavy infestation can affect buoyancy, and impact swimming ability, crucial to the reproductive success of the eel. Infected populations of American eels have been documented in the panhandle region and in peninsular Florida north of Port St. Lucie. Potential management options include angler education, treatment options, and spot checks of tackle shops selling imported bait eels.

From August 2018 – February 2019, the number of Python Removal Permits (PRP) dramatically decreased as compared to the number issued in previous report periods. The FWC has discontinued a large portion of this permit program due to a negligible number of reports of Burmese pythons removed by permit holders. The FWC issued 40 Conditional/Prohibited/Nonnative Species Permits during this period.

The UF's Tropical Aquaculture Laboratory will complete risk screenings on 10 fish species that are on the federal Injurious list, but not listed in Florida as Conditional or Prohibited by June 2019. UF will evaluate risk using the Fish Invasiveness Screening Kit (FISK) v2. Also, UF will complete risk screens for a species of salmonid that will be produced in a large-scale aquaculture operation in southeast Florida. The risks of alligator gar being present in peninsular Florida are being addressed.

A risk screening study of five conditional fish species is being done. The objective is to evaluate the five FWC Conditional fish also on the federal Injurious list, using the FISK v2. The project will be completed by UF by June 2019.

A study to screen for the invasiveness risk to Florida of 11 marine ornamental fishes of the family *Pomacentridae* using AS-ISK Phase 1 is being done. The objective is to produce biological profiles of the top nine species of pomacentrid imported into the U.S., plus two known or suspected invaders from the family. Phase 1 of this project will be completed by UF by June 2019.

The next FWC/USGS Nonnative Fish Slam will be held March 26-27, 2019, and will focus on waterbodies in the Vero Beach area, which contains a network of canals, ditches, and rivers not frequently sampled by FWC.

The 8<sup>th</sup> Annual Everglades Cooperative Invasive Species Management Area Fish Round-Up will be held April 26-27, 2019. The tournament increases awareness of non-native fish issues in Florida, and encourages consumptive use of non-native fish.

The Southwest Cooperative Invasive Species Management Area will host their first Nonnative Fish Round-Up on April 26-28, 2019. The event is held to educate members of the public on non-native freshwater fish issues in Florida, and to provide incentive to anglers to catch and remove non-native fish species as part of a competition.

The FWC and USGS co-host a “Fish Chat” approximately every two years in southeast Florida. Fisheries professionals from a variety of universities, state, and federal agencies provide updates on ongoing or completed projects. The next Fish Chat will be in November 2019.

The first Snakehead Round-Up of the 2019 season will be held in May, and will continue through October. The FWC will act as the weigh-master, and provide outreach materials to participants and spectators.

The 2019 Lionfish Removal and Awareness Day will be held May 18-19, 2019 in Destin. The first day focuses on a lionfish tournament where teams win prizes for the most, largest, and smallest lionfish caught. The second day consists of a family-oriented festival with lionfish cook-offs, exhibitors, and vendors.

**Phillips** provided copies of the Annual Report of Activities Conducted under the Cooperative Aquatic Plant Control Program in Florida’s Public Waters for FY 2017-2018. Invasive non-native plants were reported in 94% of Florida’s 453 surveyed public lakes and rivers that comprise 1.266 million acres of fresh water. Floating water hyacinth and water lettuce covered approximately 125,000 acres of Florida public waters, and are the FWC’s highest management priorities. Floating plants were present in 258 public lakes and rivers in 2018, covering approximately 5,563 acres. They are under maintenance control in all of Florida’s public waters. Managers spent approximately \$4.04 million controlling 28,677 acres of floating invasive plants in Florida’s public lakes and rivers during FY17-18. Sufficient, recurring funding and improved technology, aided by FWC-funded research, enabled managers to reduce hydrilla to approximately 31,329 acres in 2018, as opposed to infestation of approximately 100,000 acres in the 1990s. Hydrilla was reported in 181 public waters in 2018. Hydrilla tubers infest approximately 49,538 acres. In 2018, 84.5% of the hydrilla population reported covered 10 acres or less. Forty-eight percent of the hydrilla occurred in the four lakes of the Kissimmee Chain of

Lakes. Managers spent \$10.04 million applying herbicides to 20,618 acres of hydrilla in Florida public lakes and rivers during FY17-18. During FY17-18, \$2.77 million was spent managing approximately 12,238 acres of aquatic plants other than hydrilla and floating plants.

### **Georgia**

**Page** reported on the Satilla River Flathead Catfish Removal Project. During the 2018 sampling season (May-October) 4,752 flathead catfish were removed. Since 2007, over 72,000 flathead catfish have been removed. The size structure of the populations has declined, with the average size fish removed progressively dropping from 5.8 pounds in 2007 to 0.8 pounds in 2018. Biomass per effort has also declined from a high of 77.5 kg/hr in 2005, to 11.3 kg/hr in 2018. However, higher recruitment and earlier maturation are being seen. Ongoing intensive harvest will be required to control the flathead population.

A brown haplo was caught by an angler in the St. Mary's River in Charlton County in September 2018. A photo of the fish was sent to a DNR/CRD associate. Unfortunately, the 9-11" fish was released back into the river.

Seven blue catfish were collected during 2011 flathead removal. In 2017, 397 blue catfish were collected. Only 58 were collected in 2018 due to high water. Increased numbers of blue catfish concerns resource managers, so continued monitoring and removal of this species will occur in connection with flathead removal efforts.

The "Clean, Drain, Dry" educational signs continue to be posted at several boat ramps.

The Traveling Trunk continues to be a very informative tool for teaching children and adults. The trunk was displayed at Blackshear Elementary 4H Day in November 2018. The trunk reached about 290 fifth graders and 20 adults from three Pierce County schools.

### **Mississippi**

Freshwater report:

**Riecke** reported that giant salvinia was found in Aliceville Lake and Lake Okhissa.

Continued treatment of aquatic plants is continuing on state fishing lakes, state park lakes, and at Ross Barnett Reservoir. In the Pelahatchie Bay area of Ross Barnett Reservoir, considerable effort was spent treating giant salvinia. The area was closed to boating in October 2018, and it remains closed.

**Riecke** attended Mississippi Aquatic Invasive Species Council meetings to guide implementation of the activities specified in the *Mississippi State Management Plan for Aquatic Invasive Species*.

The Mississippi Aquatic Invasive Species Council informational display was set up at the 2019 Mississippi Water Resources Conference, and the 2019 MS Chapter AFS meeting.

The "Stop Aquatic Hitchhikers in Mississippi" informational brochure was revised, printed, and distributed.

A public awareness campaign (flyers, boat ramp signs, news releases) was coordinated with the Pearl River Valley Water Supply District regarding the spread of giant salvinia at Ross Barnett Reservoir.

The Asian Carp Telemetry Project continues on Pickwick and Tenn-Tom Waterway. Sampling for Asian carp will continue in the Divide Cut and Bay Springs.

The “Stop Aquatic Hitchhikers” cards continue to be distributed, along with all initial boat registrations and boat renewal registration cards that are mailed out.

The “Stop Aquatic Hitchhikers” logo and bullet list continue to be printed in the *Mississippi Outdoor Digest* and the *Digest of Mississippi Freshwater Commercial Fishing Laws and Regulations*.

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

Future activities will include: Continued chemical treatments of giant salvinia at Ross Barnett Reservoir, and surveying of the reservoir for new occurrences; surveying state lakes for aquatic invasive plants; develop management and control fact sheets on invasive aquatic plants; purchase of aquatic herbicides and hiring contractors to treat public and private waters infested by invasive plants; monitoring giant salvinia in Pickwick and the TTW; compose freshwater fishing bait regulations to specify what bait can be legally sold, possessed, transported, and used in Mississippi; seek approval of legislation required to initiate licensing of retail bait outlets selling live freshwater fishing bait; adopt a list of approved, restricted, and prohibited species under the authority specified in MS Code 49-7-80, and as specified in the *Mississippi State Management Plan for Aquatic Invasive Species*. Amend list of approved, restricted, and prohibited species as specified in the public notice that regulates aquaculture activities in Mississippi; establish an EDRR monitoring program comprised of state and federal personnel who sample aquatic species in Mississippi public waterways on a routine basis; submit backlog of reported nonnative species occurrences to ANS database; work on revisions to the *Mississippi State Management Plan for Aquatic Invasive Species*.

Saltwater report:

**Pursley** reported that a program of integrated pest management and spot herbicide application was used to control populations of common salvinia, giant salvinia, alligator weed, and water hyacinth. Salvinia weevils that have consistently helped reduce population levels of giant salvinia since 2009 have not yet reappeared after the cold winter of 2017.

During weekly control missions, 951 giant applesnail egg masses were destroyed, and 33 live snails were removed from the Pascagoula River. Since the snails were first observed in 2014, a total of 21,335 egg masses have been destroyed, and 808 live snails have been captured.

Two aerial surveys totaling 358 miles, and 36 waterway surveys totaling 253 miles, were conducted for early detection of AIS and monitoring of existing infestations.

No Cuban treefrogs have been found so far at the monitoring stations established in 2018.

A small infestation of beach vitex was eliminated after two foliar herbicide treatments. The area is being monitored for recurrence.

Mississippi Department of Marine Resources, Gulf States Marine Fisheries Commission, and the US Fish and Wildlife Service continued the Jimmy Sanders Memorial Lionfish Challenge.

In observance of National Invasive Species Awareness Week, a social media outreach campaign was conducted. The daily featured species included lionfish, giant applesnail, Asian tiger shrimp, aquatic invasive plants, and feral hogs.

### **North Carolina**

**Flora** reported that 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 resident in the general vicinity of the infestation to alert them, and to request signed permission letters for access to their land. An herbicide treatment was made in November 2018 to the largest section of beach vitex. Monitoring and eradication efforts will be ongoing in 2019. There are also several other patchy infestations in areas along the NC beach, which will all be checked out.

In 2018, there were at least five new infestations of yellow floating heart. Several infestations were already being managed across the state. Plans are being made to treat the infestations with ProcettaCOR, a new herbicide with good efficacy on floating heart. All sites will be monitored in 2019 to document control efforts.

The 2019 work plan for the Aquatic Weed Control program includes approximately 60 projects across the state.

Lake Waccamaw, a 9,000-acre natural lake in NC, received a large-scale fluridone treatment in 2018 for the 6<sup>th</sup> consecutive year. Hydrilla growth has been completely suppressed by the treatments, and there is no evidence that new tuber production has occurred since treatment began.

A large section of the Eno River was treated with fluridone in 2015 and 2016 to control hydrilla. The treatment was expanded to over 22 miles in 2017, with a repeat in 2018. Four consecutive years of treatment has resulted in 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 (ERHMTF), a partnership of local, state, and federal government agencies, academia, and non-profit organizations.

Lake Norman is experiencing its second round with hydrilla. The first time was in 2002. An aggressive grass carp release quickly reversed hydrilla, and there was complete suppression by 2004. There were no reports from 2004-2016. In 2017, hydrilla showed up in a different part of the lake as a new introduction. A survey revealed that there was approximately 500 acres of hydrilla, isolated to one area of the lake. In spring 2018, 10,200 grass carp were released. This

outbreak epicenter is a high-volume boat access area. As of September 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. In 2018, 1,828 fish from 71 sites were collected for evaluation.

Efforts continue with SCFPDL to explore spatial distribution and life history characteristics of gill lice. In 2018, copepod collections occurred at nine sites.

Tennessee Tech University initiated a regional-scale assessment in 2018 to define the current distribution of *Didymo* in western NC. *Didymo* cells were identified in the Tuckaseegee River in 2015, but little information has been obtained on the diatom in the state.

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

There were four reports of tiger shrimp in 2018. One fisherman brought four shrimp to DMF staff and said he caught at least 10 tiger shrimp so far this year. In 2012, tiger shrimp was added as a code to the state trip ticket program. Annual landings have ranged between 5-25 pounds.

The blue catfish range in NC has been expanding over the years, and commercial landings have been increasing. They are expanding into the Pamlico Sound region. The NC Wildlife Federation is concerned with expansion, especially in the lower Pamlico and Neuse rivers. The NC Division of Marine Fisheries 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. They are likely the cause for the decline of the Carolina madtom. Intensive surveys and management actions, including flathead catfish removal, may be needed 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 Cape Fear. The study will look at habitat and prey selection of flathead catfish.

The NC Aquatic Nuisance Species Management Plan is being reviewed and edited by the steering committee that authored the plan. No major changes are anticipated. It will then be submitted to the ANSTF.

### **South Carolina**

**Kingsley-Smith** reported on the assessment of the current distribution of the island apple snail, *Pomacea maculata*, in West Ashley and its potential to invade the estuarine habitats of the Ashley River in South Carolina. Recent research conducted at the South Carolina Department of Natural Resources to investigate the salinity tolerance of newly hatched snails produced by adults collected from wild South Carolina populations indicates an ability to tolerate salinities as

high as 8 psu which are representative of upstream estuarine habitats in South Carolina. There is a well-established population of apple snails in a suburban neighborhood in West Ashley, specifically within storm-water retention ponds at the Village Green residential development, which is located less than 2 miles from the Ashley River. In order to determine the distribution and potential spread of apple snails in the neighborhood, SC DNR biologists surveyed 28 ponds, and one seasonally-flooded forested wetland in October and November 2018 in West Ashley, SC. *Pomacea maculata* were present in 21 of the ponds – 882 adults, and 4,985 egg clutches. There was no evidence of an established population in the forested wetland area. Four of the ponds that were previously surveyed in 2015 and showed no evidence of establishment, contained between 58 and 156 adult apple snails, and 119 to 1,386 egg clutches in the 2018 surveys. These results demonstrate that over the course of three years, *P. maculata* has demonstrated short-distance dispersal capabilities across waterways that contain no surface water connection at mean water levels.

Researchers working to better understand the threats posed by *P. maculata* have been active in disseminating their research in peer review journals. Several manuscripts will be appearing in the next issue (April 2019) of the *Journal of Shellfish Research*.

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. It is native to the southern Mississippi River drainage to Illinois, and the Gulf coastal plain from the Florida panhandle to Mexico. When *P. clarkii* is 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 it invades. Several populations of *P. clarkii* were previously identified in the Pee Dee and Waccamaw river drainages in South Carolina by SC DNR staff. This species had not been previously reported, which indicates that they 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, *Procambarus braswelli*, a Priority I species that has only been documented in a few locations in the state. The SC DNR Crustacean Research and Monitoring Section is currently working on several projects to better understand the recent spread of *P. clarkii* in SC, its mechanisms of dispersal in the Waccamaw and Pee Dee River drainages, and its potential impacts on native crayfish in the state.

In November 2018, SC DNR biologists surveyed for *P. clarkii* in the Pee Dee watershed, and the Waccamaw watershed in January 2018. A total of 16 locations were sampled, and five different species of crayfish were collected. At 15 of the sites, *P. clarkii* were recorded, and 299 *P. clarkii* were collected. Other species collected included the conservation-priority species Carolina sandhills crayfish, and the Waccamaw crayfish. Also, 64 locations in and around the Francis Marion National Forest and locations in Charleston County, SC were surveyed by a SC DNR employee from November 2018 – April 2019. During the surveys, six species were documented, and included: the conservation-priority species Santee crayfish; coastal plain crayfish; cedar creek crayfish. The invasive red swamp crayfish was documented at six locations – four locations on James Island, and two locations near Bulow Plantation in Charleston County. To assess the mechanisms of *P. clarkii* in the Pee Dee and Waccamaw River drainages, species-specific microsatellite markers are being developed and optimized by SC DNR biologists



through funding from the USFWS State Wildlife Grants Program. The microsatellite markers will be used to determine population genetic structure among populations of *P. clarkii* in the Pee Dee and Waccamaw River drainages.

Also of concern in the state of South Carolina are two non-native species of crayfish, the rusty crayfish, *Faxonius rusticus*, and the virile crayfish, *Faxonius virilus*. They are currently established in North Carolina, only a few miles from the North Carolina-South Carolina border in the Broad and Catawba River watersheds. In July 2018, SC DNR biologists, in collaboration with the Catawba Indian Nation, collected specimens of *F. virilus* in a region of the Catawba River located on the Catawba Indian Nation Reservation in South Carolina. With recently acquired funding from the USFWS State and Interstate Aquatic Nuisance Species Management Plan Program Funding, SC DNR biologists are surveying more locations in the Broad and Catawba Rivers in South Carolina for both *F. virilus* and *F. rusticus*. In October 2018, main stem and tributary systems of these rivers were sampled. Neither invasive species in the genus *Faxonius* were found from the sampling locations. Native *Cambarus* species were documented from five sampled locations in both river systems.

The redeye bass (also known as Bartram's bass) in the Savannah River Basin, 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). The listing is mainly due to the 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. South Carolina DNR researchers have captured Alabama bass and hybrid individuals in recent years in riverine habitats upstream of the reservoirs, while pure Bartram's bass are increasingly confined to smaller rivers. While previous work by the SC DNR has documented that Bartram's bass populations are diminishing due to introgression with Alabama bass, key questions remain regarding the extent of this process in tributary streams.

Preliminary assessments of Bartram's bass individuals and egg samples have been conducted using probe-based quantitative PCR (qPCR) 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. This approach using probes specific to Bartram's bass, or "all other" (currently largemouth, smallmouth, and Alabama bass), 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 this project, SC DNR researchers proposed to develop a microsatellite-based genetic tool to investigate hybridization in black bass populations (specifically Bartram's bass) in the Savannah River basin. Microsatellites are short sequences of DNA that contain variable repeating units of base pairs that can be thought of as "genetic fingerprints" of individuals. This variability, combined with a high mutation rate, make microsatellites an effective tool to investigate genetic structure and hybridization among populations. In addition to 10 polymorphic microsatellites developed for redeye bass, microsatellites originally developed for largemouth bass have been used for other black bass species to assess hybridization impacting endemic shoal bass in the Chipola River. Hierarchical STRUCTURE analysis suggests that black bass genotyped at 17 loci with sets of reference

samples of congeneric species that occur in that part of the country (shoal bass, northern spotted bass, largemouth bass, Choctaw bass, Alabama bass, Suwanee bass, and smallmouth bass) can be assigned to clusters with high confidence. To date, researchers in the SC DNR Marine Resources Research Institute (MRRI)'s Population Genetics Research Section have completed the optimization of the marker suite, and have made substantial progress on the sample genotyping. Progress was substantially hampered by the extended Federal government shutdown in December 2018, however, as this section's primary genetics laboratory is housed within the federal Hollings Marine Laboratory. Researchers were able to make some progress on project activities following relocation of the entire lab to a state facility. The research team has completed the reference sample genotyping, refined the binning analyses for the new marker set, and is in the process of evaluating the data to develop an analysis protocol using STRUCTURE analyses to identify genetic ancestry and hybridization in unknown samples.

Researchers at the SC DNR Marine Resources Research Institute completed 'step one' of the funding request for 2019-2010 SIANSMP funding. If supported, this funding will support these projects: The potential hybridization of the invasive red swamp crayfish, with its sister species the Eastern red swamp crayfish; is the red swamp crayfish a vector for the white spot syndrome virus?; assessment of current distribution and potential of the island apple snail, *Pomacea maculata*, to invade estuarine habitats in West Ashley, SC; hybridization, gene flow, and introgression between native redeye bass and introduced Alabama bass.

Resulting in part from previous funding through USFWS ANS Small Grants Program, a paper, Development of a qPCR tool for the environmental detection of *Anguillicoloides crassus*, an invasive pathogenic parasite in the American eel, *Anguilla rostrata*, was submitted in October 2018, and remains in review.

At the triennial meeting of the World Aquaculture Society, National Shellfisheries Association, National Aquaculture Association, and the American Fisheries Society Fish Culture Section held in New Orleans, LA on March 7-11, 2019, Dr. Michael Kendrick chaired a special session entitled "Decapod Crustaceans". The session included two presentations by SC DNR researchers, featuring some of the invasive crayfish research being done. The presentations were: Effects of the non-native *Procambarus clarkii* on native crayfish populations in North Carolina and South Carolina, USA; Investigation of the salinity tolerance of invasive and native coastal crayfish in South Carolina, USA.

### USACE

**Lane** reported that they are doing an alligator weed flea beetle collection. The beetles are available free of charge. **Jon** told the panel members to contact him if anyone wants some.

Funding was received this year for their aquatic programs. Their budgets have not been impacted, and they received additional funding this year.

USACE has been partnering with the USDA and RCS through their easements program as their contractor on their easement lands. USACE received \$18 million from a farm bill for the next four years to do invasive work on their lands.

As part of the Comprehensive Everglades Restoration Plan (CERP), the Central Everglades Planning Project (CEPP) will identify and plan for projects on land already in public ownership to allow more water to be directed south to the central Everglades, Everglades National Park, and Florida Bay. The CEPP will incorporate invasive and nuisance species assessments and management of those species into pertinent planning documents and phases of the project. Funding is expected in FY2020.

## **Texas**

**Hartman** reported that a letter from TPWD dated November 13, 2018 was sent to Texas bait dealers in which it stated that “it has come to the attention of TPWD that some bait dealers have been selling frozen non-native imported shrimp as bait for recreational fishing in coastal waters of the state. The imported shrimp is not native to Texas or the western Gulf of Mexico, and therefore, are classified as “harmful or potentially harmful exotic shellfish” under Texas Administrative Code, Subchapter A (Harmful or Potentially Harmful Fish, Shellfish, and Aquatic Plants)”. The letter further stated that the licensed bait shrimp dealers were “not allowed to purchase, possess, or sell exotic shrimp, and any exotic shrimp they may be possessing must be removed from the sales shelf”. A white spot syndrome virus has been detected in frozen shrimp. The Texas shrimp industry has been valued at about \$130 million. The recreational industry has been valued at about \$1.1 billion. There is concern that the white spot syndrome virus will be transmitted to native shrimp, crabs, crustaceans, etc. There are also other viruses that the freezing process does not kill. Over the last few years, TPWD has received approximately \$3.2 million annually for invasive species work. This year, the focus has been on bait dealers. Also, a communications plan has been created to change perceptions of the public that it is okay to use the non-native shrimp as bait. Online ads have been designed, the TPWD website has information on the non-native shrimp bait, the TPWD face book page also has information, and printed brochures have been created. Signs will be posted at bait stands, boat ramps, and jetties. Email blasts are also being done. Print ads in magazines are being used. Radio shows and digital billboards are other ways that information is being provided to the public. TPWD is also partnering with other agencies.

The “Don’t Dump your Tank” campaign is receiving more funding. The TPWD website has information on the campaign.

There has been a lot of focus on the “Clean, Drain and Dry your Boat” campaign. A total of 564,000 registered boat owners received information on the campaign. A total of 179 impressions have been made through radio, online, print, and outdoor advertisement as part of the “Protect your Lakes you Love” campaign.

Sixty-four high-risk lakes were monitored to add to early detection of zebra mussels.

Sixty rivers and lakes were managed to control infestations of aquatic plants.

Over 9,000 acres of aquatic invasives were treated in Caddo Lake.

Along 178 miles of the upper Brazos River, 10,400 acres of saltcedar were treated.

### **University/Research**

**McMahon** reported that since 2011, they have been looking at zebra mussel ecology population dynamics in three Texas lakes. A university PhD graduate student is writing her dissertation on the results. This has been the most extensive population dynamics work ever done on zebra mussels. In Texas, the zebra mussels have been in the warmest environments that they have ever been in in their life cycles.

**McMahon** has been looking at zebra mussel settlement, and has been working with a junior college professor on the project. Settlement only occurs when there are petty veligers in the water.

During plankton sampling for zebra mussel veligers at 23 different lakes throughout Texas, a bycatch of the sampling was *Daphnia lumholtzi*, a species of small, invasive water flea that originates in Africa. They were first found in a lake near Austin in 1983. Of the 23 lakes investigated, 18 were infested with *Daphnia lumholtzi*. They do not, however, appear to be out-competing regular daphnia or other planktonic crustaceans. It appears that they have infested most eastern lakes in Texas.

### **Port Authority**

**Carangelo** reported that in December 2018, the President signed into law the Vessel Incidental Discharge Act (VIDA). VIDA requires EPA to develop new national standards of performance for commercial vessel incidental discharges and the U.S. Coast Guard to develop corresponding implementing regulations.

Instead of having vessels come into port, then boarding them for inspection, and discovering there is a paperwork violation because the ballast water treatment systems are not operating, it must now be reported to the USCG ahead of time that they have had problems.

Scientists at Duke University are working with eDNA to identify the source of ballast water in ships, based solely on the community of microbes in the tanks. The scientists claim a scan of the eDNA in ballast water can show whether ships are following rules meant to prevent the transport of invasive species. Several of the panel members expressed concerns with that research, since there is a possibility of a false positive finding.

### **USGS**

Ian Pflingsten reported that Pam Fuller retired from USGS in January. Wes Daniel will most likely be the USGS representative on the GSARP panel, with Matt Nielson as the alternate.

### **Other Business**

**Tom Jackson** stated that the March 2020 GSARP meeting will probably be his last meeting.

**A Motion was made to nominate Pam Fuller for the Panel Award. It was seconded, and the Motion passed.** The award will be presented to **Fuller** at the fall meeting.

**Kingsley-Smith** suggested that the Traveling Trunk be re-named to “The Herb Kumpf Traveling Trunk” in memory of his passing. **A Motion was made to re-name the Traveling Trunk to “The Herb Kumpf Traveling Trunk”. It was seconded, and the Motion passed.**

**Ballard** stated that on the next panel conference call, he would like to discuss panel membership. He requested that prior to the call, members should make recommendations for membership. There are several vacant seats that can be filled if necessary.

**A Motion was made to elect Pam Fuller as an At-Large Member of the panel. It was seconded, and the Motion passed.**

### **Next Meeting Time and Place**

The location of the next meeting will be in Charleston, South Carolina.  
The date will be in September or October.

### **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 1:00 p.m. A field trip for electrofishing in canals at Markham Park followed, and reptiles and amphibians were on display.**