GULF & SOUTH ATLANTIC REGIONAL PANEL
ON AQUATIC INVASIVE SPECIES
MINUTES
Monday, April 2 & Tuesday, April 3, 2012
Mobile, AL

On Tuesday, April 3, Chairman **Leslie Hartman** called the meeting to order at 8:30 a.m. The meeting began with introductions of the members and guests. The following were in attendance:

Members & Proxies
James Ballard, GSMFC, Ocean Springs, MS
Tim Bonvechio, GA DNR, Waycross, GA
David Britton, USFWS, Arlington, TX
Rick Burris, MDMR, Biloxi, MS
Earl Chilton, TPWD, Austin, TX
Rob Emens, NC DENR, Raleigh, NC
Chris Furqueron, National Park Service, Atlanta, GA
Dewayne Hollin, TX Sea Grant, College Station, TX
Leslie Hartman, TPWD, Palacios, TX
Robert Bourgeois, LA Dept. of Wildlife & Fisheries, Baton Rouge, LA
Chuck Jacoby, At-Large Member, Palatka, FL
Tom Jackson, NOAA Fisheries, Miami, FL
Peter Kingsley-Smith, SCDNR, Charleston, SC
Herb Kumpf, At-Large Member, Panama City Beach, FL
Robert McMahon, UT Arlington, Arlington, TX
Doug Nemeth, U.S. Navy, Jacksonville, FL
Craig Newton, AMRD, Dauphin Island, AL
Chris Page, SC Department of Natural Resources, West Columbia, SC
Steven Rider, AL DCNR, Montgomery, AL
Don Schmitz, FWC, Tallahassee, FL
John Teem, FL DOA, Tallahassee, FL

Staff
Alyce Catchot, GSMFC, Ocean Springs, MS

Others
Lad Akins, REEF, Key Largo, FL
Matt Cannister, USGS, Gainesville, FL
Susan McCarthy, FDA, Dauphin Island, AL
Matt Neilson, USGS, Gainesville, FL

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

Adoption of Agenda
For the Tuesday, April 3, 2012 agenda, presentations by L. Akins and T. Jackson were added.

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

Approval of Minutes
The minutes of the meeting of the October 4-5, 2011 meeting in Austin, TX were presented for approval.

After minor changes to the minutes, a motion was made to approve the minutes. Furqueron seconded the motion, and the motion passed.

Apple Snail Control/Sampling in Langan Pond and Three Mile Creek
Dave Armstrong presented a PowerPoint Presentation entitled "Control Methods & Status of Non-native Island Apple Snails in Southwest Alabama". Island Apple Snails (*Pomacea insularum*) were reported and documented in Langan Municipal Lake in June, 2008. They were likely released via the aquarium/pet trade. These exotic, non-native "aquatic nuisance species" are native to South America. They are capable of producing offspring at less than one year of age, and females lay 1000's of eggs annually. Apple snails destroy wetland habitats by consuming native aquatic plants. They destroy agricultural crops primarily in the Southern U.S., the Philippines, and Southeast Asia. Native aquatic life is displaced through competition for food, space, and habitat. Apple snails are a potential carrier of rat ringworm, intestinal fluke, and rat lungworm.

Several approaches have been undertaken to control apple snail population. Copper sulfate, an EPA-approved chemical, is being applied to control the adults. Egg-laying substrates are being reduced by applying EPA-approved herbicides on emergent aquatic plants at wetted banks. Low water levels are being maintained in Langan Lake. Egg masses are being scraped. Population changes are being assessed by trapping.

Two infestation locations in Southwest Alabama include the Threemile Creek watershed from upper pool Langan Municipal Lake downstream through approximately eight step pools to the tidal portion of the creek which empties into the Mobile River, and the Blakely Forest Pond watershed (a residential retention) which drains to Bay Minette Creek, a major creek in the Mobile-Tensaw delta system. From 2009-2011, a total of 714 lbs. of copper sulfate treatments were applied to Blakely Forest Pond; 9,759 lbs. were applied to Langan Municipal Lake; 9,780 lbs. were applied to Threemile Creek. Numerous chemical control agents have also been applied and this has resulted in the control of aquatic vegetation used as egg-laying substrate by the apple snails, including Giant cutgrass which accounts for 80-90% of apple snail egg mass substrate.

From 2010-2011, five emergent weed applications were applied to Langan Municipal Lake, and 12 applications were applied to Threemile Creek. No treatments were applied to Blakely Forest Pond, as residents were instructed on how to mow and remove brush weed growth at the pond's bank edge without the use of chemicals.

From 2009-2011, snail traps were placed in Langan Lake. A total of 762 snails were collected. From August – December, 2010, five traps were placed in Blakely Forest Pond, where trap sample data was collected by local residents.

To date, repeated treatments, emergent plant control, and lower summer-fall water levels (due to below-average rainfall) appear to have substantially reduced snail abundance. Partnerships forged between ADCNR, USFWS, the City of Mobile, and various NGO's have helped to fund work and/or provide manpower in order to continue keeping snail populations at low densities. Current funding by USFWS should allow control work to continue through FY 2012 at an adequate level.

Hartman asked Armstrong if he anticipated any consequences such as erosion problems by removing large quantities of emergent vegetation along the pond banks. Armstrong replied that erosion is an issue; however, it is not being monitored at this time. There has been some erosion, but the exact cause is not clear.

Impacts and Control of Cogongrass in the Southeast

Nancy Loewenstein gave a PowerPoint Presentation entitled "Cogongrass (and tallowtree) Identification and Control". Cogongrass (*Imperata cylindrica*) is a Federal Noxious Weed that displaces native plants, is a poor wildlife habitat, is an extreme fire hazard, reduces forest productivity, and possibly increases pine tree susceptibility to pine decline. It originated from Asia and was first introduced into Grand Bay, AL in 1912. As reported to state authorities by May 2010, all known infestations in South Carolina, Georgia, and Tennessee are under treatment.

Cogongrass has showy white flowers that are 2-8 inches long, and blooms in the spring or after a disturbance. Just-opened cogongrass flowers are often more purple than white. Cogongrass grows 1-5 feet tall, often in circular patches. The rhizomes are dense and matted with very sharp points and are segmented with papery scales. Over 50% of the biomass is underground.

Cogongrass burns very hot. Even fire-adapted plants such as longleaf pine can be killed by cogongrass fires. Within weeks of a fire, cogongrass will re-sprout; however, many other plants are killed.

Several grasses are often mistaken for cogongrass: Johnson grass, Vasey grass, Silver beardgrass, Broomsedge, and Yellow Indiangrass.

Cogongrass seed is dispersed via wind, vehicles, equipment, clothing, and agronomic products.

Cogongrass is also dispersed via rhizomes. Repeated, frequent tillage that breaks up the rhizome mass, followed by glyphosate, has proven to be an effective control method of cogongrass. However, infrequent tillage only spreads cogongrass. Equipment must be cleaned after tillage to prevent rhizome spread. Mowing cogongrass stimulates flowering and should be avoided during flowering. This method is for suppression only. Most grazing animals find cogongrass unpalatable, and grazing is useful for suppression only. Fire also cannot be used for control; however, it can be used to reduce thatch before chemical treatments, but caution should be used.

Herbicide control can be used to eradicate cogongrass on individual sites. One application per year of glyphosate can control cogongrass, but two applications are more effective. Imazapyr is consistently more effective than glyphosate, but soil residual activity and sensitivity of hardwoods and longleaf pine is a potential issue. Combining the two herbicides did not provide better control than either used alone.

Objectives are to study the impacts of cogongrass invasion on insect communities of southeastern pine forests; the influence of cogongrass management strategies on insect diversity and abundance; the influence of cogongrass on pine tree susceptibility to pine decline.

Loblolly Pine decline is an increasingly important issue in the southeast. It is caused by a complex of abiotic and biotic stressors. Stressed trees attract root-feeding bark beetles. Does cogongrass increase tree stress? Does cogongrass impact bark beetle population levels? Does cogongrass increase susceptibility to pine decline?

Preliminary conclusions from the study:

- Ecologically-based integrated treatment
  - Seeding alone had little impact on cogongrass cover
  - Seeding, when combined with burning and glyphosate treatments, may contribute to control

- Response of insect communities to cogongrass and its treatment is as yet unclear

- Several root feeding beetles were found in greater abundance in cogongrass-infested pine stands
  - ~10% were infected with the fungi associated with pine decline
  - More tree roots had fungal infections in infested plots
  - No overt signs of pine decline in the stands

Control recommendations are not to enter infestations when seed heads are present; not to work in cogongrass when soil is muddy; not to grade or push roads or fire lines through cogongrass; not to use contaminated fill dirt. Cogongrass seed heads should be removed by cleaning vehicles, equipment, and clothing before moving to an un-infested site. Planting cogongrass and cultivars such as Japanese blood grass 'Red Baron' in residential lawns should be avoided.

Cogongrass infestation sites should be treated as soon as possible. The smaller an infestation is, the easier it is to control. The entire plant must be destroyed because otherwise the rhizomes will re-sprout. Sites need to be monitored for re-growth or new infestations. Fast-growing native plants should be established and/or released to stabilize and protect the soil, to outcompete and shade out any surviving cogongrass, and to prevent new cogongrass or other invasive plants from getting established. For more information on cogongrass, visit www.cogongrass.org.

Loewenstein next reported on Chinese tallow tree (*Triadica sebifera*). Also known as popcorn tree, this invasive tree was first introduced as an ornamental tree. It now occupies 596,238 forested acres in the southeast. There has been a 2,000+ acre increase in Alabama since 2008.

There has been a 500% increase in tallowtree in Louisiana, and is now the 4th most common tree in southern Louisiana. A large tree can produce over 100,000 seeds. To view a map of the infested areas of the southeast, visit http://www.invasive.org/fiamaps/.

There will be a joint meeting of the Southeast Exotic Pest Plant Council (SE-EPPC) & Alabama Invasive Plant Council (ALIPC) – "Past, Present & Future: Invasive Plants of the Southeast". It will take place in Auburn, Alabama from May 8-10, 2012. For more information on the meeting, visit http://www.se-eppc.org/2012/.

Zebra Mussels in Texas: Implications for Southern States

Robert McMahon gave a PowerPoint Presentation entitled "Zebra Mussels in Texas: Implications for Southern States". Zebra mussels (*Dreissena polymorpha*) and quagga mussels (*Dreissena rostriformis bugensis*) were originally endemic to Europe and were introduced to North America via the Black Sea around 1986. They were found in Lake St. Clair and the eastern basin of Lake Erie in 1989. They rapidly spread throughout major U.S. and Canadian drainage systems east of the Rocky Mountains. There was rapid dispersal through navigable waterways via commercial vessels, and slower dispersal into isolated water bodies via overland transport. They are the most costly macrofouling and ecological pests ever introduced to North American freshwaters. Quagga mussels were recently found in Lake Mead, the lower Colorado River, and lakes in southern California. Zebra mussels were recently found in the San Justo Reservoir in Central California. Large stable rivers and lakes with reduced level fluctuations are most prone to invasion. There has been limited success in rivers prone to extensive flooding and lakes with large annual level fluctuations.

Zebra and quagga mussels both efficiently filter bacterioplankton. Large adults may filter up to 1 L/hour. This results in rapid clarification of infested waters and removes phytoplankton, impacting energy flow through food webs. Quagga mussels are more efficient at filtering bacteria, which leads to the eventual replacement of zebra mussels by quagga mussels.

The maximum adult size of zebra mussels is 2.5 – 4.0 cm, dependent on population. The growth rate declines with increasing adult size. Their maximum age is 3 – 5 years, depending on population. The survival rate is low across year classes. Adult growth rates and population density are dependent on temperature and phytoplankton and bacterioplankton productivity. Fecundity is as high as 1,000,000 eggs per adult female per year. High fecundity and rapid growth rate leads to the development of massive populations within 3-5 years of initial introduction.

Water quality factors affect dreissenid mussel distribution and invasion. They inhabit waters with pH < 7.4 and attain the highest densities at pH > 8.0. They do not spawn or successfully fertilize above salinity of 7 ppt. The larvae do not develop at > 8 ppt, and juveniles and adults do not survive > 5 ppt (14% SW). Turbidity is unlikely to be a factor in limiting distribution, and the mussels thrive in the lower Ohio and lower Mississippi Rivers at > 80 NTU units. Organic enrichment does not generally limit distribution except when associated with hypoxic conditions, and will accelerate growth. The mussels are intolerant of waters with natural potassium concentrations of > 30 mg/L K. In rivers that are prone to extensive flooding, and lakes with large annual level fluctuations, infestation is less likely. Large stable rivers and lakes with

reduced level fluctuations are the most prone to invasion. They are generally as tolerant of industrial and municipal water pollution as are native unionid and Asian clams but will not invade waters made chronically hypoxic by receipt of organic pollutants.

The genetic diversity of 16 zebra mussel and 6 quagga mussel populations was analyzed for comparison of genetic differences using AFLP (Amplified Fragment Length Polymorphism) analysis. Populations of either species could not be distinguished. All showed high levels of genetic diversity, which suggests that there are no genetic bottlenecks or founder effects in recently established populations. A large number of mussels are required to establish a population.

In the invasion of southern water bodies by zebra mussels, it is generally agreed that the long-term incipient upper thermal temperature limit is 28 - 30°C. The generally agreed-upon temperature for initiation of spawning is 16 -18°C. These temperature limits were used to predict potential zebra mussel distribution in North America based on maximum summer surface water temperatures. Recent successful establishment of zebra mussels in Texas requires a re-examination of these assumptions. Experiments done on temperature tolerance in zebra mussels revealed that 25°C acclimated mussels exposed to a lethal temperature of 33°C. The control sample was held at 33°C until 100% mortality ensued. The second sample was held at 33°C which was long enough to induce partial sample mortality, and the surviving individuals were allowed to recover at 25°C. Chronic thermal tolerance at 33°C of the surviving mussels was retested. The experiment was repeated three times.

An adult zebra mussel was discovered in the lower end of Lake Texoma on the Red River on April 3, 2009. Lake Texoma was considered thermally resistant to zebra mussel invasion. Its surface water temperatures reach or exceed 30°C in mid-summer. Mussels have now been recorded at numerous sites in the lower end of the lake. Populations are rapidly expanding and increasing in density. The mussels likely have evolved increased thermal tolerance in nearby southwestern water bodies in Kansas and Oklahoma.

If zebra mussels can thrive in the warm waters of Lake Texoma, can they invade other Texas lakes with similar annual temperature profiles? Through the Quagga-Zebra Mussel Action Plan (Q-ZAP), the USFWS funded an effort to develop and test a zebra mussel monitoring and risk-assessment system for 13 lakes in northeastern Texas receiving recreational boat traffic from Lake Texoma. The system design requirements are that it must be simple, accurate, cost-effective, and easily applied. It must also provide rapid risk assessment and detection and be readily applied by TPWD personnel.

Fourteen lakes were sampled in the spring and fall of 2011 when larvae were present (surface water temperature of 18-28°C). Physical data was recorded for risk assessment and the ambient water temperature was recorded hourly. Plankton net sampling was done for mussel veliger larvae. Scouring pad pediveliger settlement monitors were deployed for 3-4 weeks. Microscopic examination of live and preserved plankton samples revealed the presence of veliger larvae from June – November only at Lake Texoma. No veligers were observed in either spring or fall samples from the 13 other examined lakes. Settled juvenile mussels were recorded only on Lake Texoma monitors that were immersed from 6/2/2011 – 6/30/2011. The mean water

temperature was 25.3°C over 28 days of immersion. Juveniles were relatively densely settled on the monitor. No settled juvenile mussels were recorded on Lake Texoma monitors immersed from 8/10/2011 – 8/24/2011 (mean water temperatures 30.12°C) or 10/21/2011 – 11/19/2011 (mean water temperatures 18.67°C). Viable veligers were present in the water column during both periods.

In conclusion, zebra mussels appear to have evolved increased thermal tolerance in the warm water bodies of Kansas and Oklahoma. This may allow zebra mussels to invade Lake Texoma and other warm southern water bodies. Lake Texoma could become an epicenter for zebra mussel dispersal to other warm water bodies in Texas and the Gulf States. Because of the increased potential to invade warm water bodies, water bodies in the Gulf States should undergo invasion risk assessment for zebra mussels. Risk assessment indicated that 11 of 13 lakes in northeastern Texas could support zebra mussels. Nine of 13 Texas lakes appeared to be at high risk of invasion. Lake Bob Sandlin, Lake O' the Pines, and Caddo Lake are all unlikely to support zebra mussels due to their low calcium concentrations and high water temperatures. Boaters appeared to be the major vectors for mussel movements between water bodies. Zebra mussel monitoring programs for warm southern water bodies should include juvenile settlement monitors, and plankton net sampling for veliger larvae. It is imperative that zebra mussel risk assessment and monitoring programs be developed for southern water bodies in order to identify those most vulnerable to invasion. This allows early detection and rapid response to mussel invasion, and prevention and education programs to be focused on water bodies most at risk.

Teem asked that since zebra mussels appear to have evolved increased thermal tolerance, wouldn't they also develop a tolerance for lower calcium levels and move into water bodies with lower calcium levels? **McMahon** replied that there has been no indication of that.

McMahon stated that in the western basin of Lake Erie in the Great Lakes, Diving Ducks feed on the mussels, and thousands of the ducks re-shifted their migration patterns in order to feed on the mussels. However, this has not caused a major decline in the mussel population.

McMahon reported that in Lake Texoma, the worst cyanobacteria bloom in record occurred and people were warned not to go into the water. **McMahon** stated that it can almost certainly be attributed to zebra mussels.

D. Hollin asked if outreach efforts have worked. **McMahon** stated that many positive changes have taken place since their outreach and awareness efforts began.

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

J. Teem gave a PowerPoint Presentation entitled "Reproductive Sterility as a Tool for Prevention and Control of Invasive Aquatics". The USDA currently allows only *P. brigesii* to be sold and shipped in the U.S. *Pomacea brigesii* will leave aquatic plants intact and are produced in Florida. There are some established populations recorded in the USGS database. *Asolene spixi* eats aquatic plants and is no longer in trade. There are no established populations recorded in the USGS database. Can reproductively sterile *P. brigesii* and *A. spixi* be produced as new ornamental snail products? Sterile *P. brigesii* could be sold without any requirement for USDA

approval. Is there a potential market for sterile *P. brigesii*? Sterile *A. spixi* cannot be sold without USDA approval. Is there a potential market for *A. spixi*?

What dose of radiation (x-rays) will render snails reproductively sterile? The snails are radiated, the radiated snail is mated with a wildtype, the eggs are collected, and a determination is made as to whether or not the eggs hatch into snails that survive. Dave Rawlins of Rawlins Tropical Fish Farm in Lithia, Florida monitors the snail mating chambers for mortality and fertility

The viability of irradiated *P. brigesii* adults decreases at radiation doses above 130 Gy. Fertility in irradiated snails is reduced by a decrease in egg production and a reduction in fertility of eggs. To produce sterile snails, two genetic alternatives to radiation are triploidy and chromosomal translocations. Drug intervention during fertilization is used to produce triploids. However, fertilization is internal in apple snails, complicating the use of drug treatments.

Mating snails provide a source of zygotes for drug intervention to induce triploidy. If triploids are produced following fertilization, they should be detectable in the egg mass. The mating snails were drug treated, the eggs were harvested, and the eggs were analyzed by flow cytometry. No triploids were observed in the egg masses. Can the cells in the gonad be treated with drugs to induce ploidy changes in gametes? Additional work is required to determine whether these changes reflect a change in the ploidy of sperm.

In conclusion, no triploids have been generated yet. However, more work is needed to determine whether gonadal drug treatment could be a potential route to produce triploid apple snails. Fertility and viability are being assessed in irradiated *P. brigesii*. *A. spixi* irradiation dose determination experiments are under way.

Bonvechio asked if the effort and costs put into irradiating the snail would drive the cost up of the snail to the point that they would no longer be marketable. **Teem** stated that it is a possibility.

Update – Trojan Y Chromosome Eradication of Invasive Fish Project

J. Teem gave a PowerPoint Presentation entitled "Trojan Y Chromosome Eradication of Invasive Fish: Sex-specific sex Markers in Tilapia". Females with two Y Chromosomes produce only male progeny, half of which are Myy. Myy males are viable and produce only male offspring. Four different matings are possible, leading to increased male production. The addition of a Trojan Y female (Fyy) to a target population will cause females (Fxx) to become extinct over time. The carrying capacity of the system becomes occupied by Myy fish (males with two Y chromosomes).

A Trojan Y chromosome strategy might be an appropriate technique for controlling invasive species. It is species specific; requires no new technology development; involves standard aquaculture techniques with no recombinant DNA; Trojan Y chromosome fish have already been produced in one species (*Oreochromis niloticus*); it is reversible. TYC requirements are that the target fish must have a XY sex-determination system; the target fish must be amenable to hormone-induced sex reversal; a female fish with two Y chromosomes (Fyy) must be viable and mate at the same efficiency as wildtype; the target fish must be amenable to propagation via

aquaculture. The production of YY fish requires selective breeding and the use of hormone-induced sex reversal techniques. YY genotypes are verified by test crosses and evaluation of the sex distribution in progeny. Sex-specific DNA markers can greatly reduce the time required to generate YY fish by allowing YY genotypes to be detected by DNA analysis (instead of test crosses). For some time, sex-specific DNA markers have been identified by using the RAPD PCR method. The process for this method is to first create a DNA pool from only females, and another from only males. Each pool is then tested with PCR using a collection of short DNA primers that will amplify sequences at different locations in the genome. For each primer, female-specific DNA is compared with male-specific amplified products using gel electrophoresis. A primer is found that gives a band in one DNA pool, but not the other.

Three invasive fish species were screened for sex-specific DNA markers using RAPD PCR: Nile Tilapia, African Jewelfish, and Silver Carp. A male-specific DNA marker for common carp was identified. Could this same DNA marker be used to identify males in silver carp, tilapia, or African jewelfish? A male-specific carp marker can be used to design 10-mer RAPD PCR primers. No sex-specific markers have been isolated as of yet for African jewelfish, silver carp, or tilapia. Larger numbers of fish will be included in pooled male-specific and female-specific DNA pools. Screening will continue for all three invasive fish, with help from USGS on African jewelfish.

Final Report on the AIS Traveling Trunk Project

H. Kumpf gave a PowerPoint Presentation entitled "Traveling Trunk of Invasive Species". **Kumpf** reported that it is because of the alarming numbers and impact of invasive species that information was compiled and the "Traveling Trunk" was produced for the GSARP. The trunk is intended to serve as outreach and an educational resource from the panel. The trunk consists of three sections: (1) "Traveling Trunk of Invasive Species" talking points manual (2) A PowerPoint Presentation on compact disc (CD) of the manual contents (3) Samples of embedded and laminated invasive species specimens for "hands-on" use. The manual suggests that trunk users review the checklist of contents, preview the talking points, test the CD for projection, and familiarize themselves with the included examples. The material is appropriate for secondary school students, gifted programs, and interested lay people. There have already been requests by several educators and organizations that want to utilize the trunk. Because of the large amount of interest expressed, collection of materials for four additional trunks has begun. Suggestions, comments, and ideas are appreciated and can be emailed to the Regional Panel at www.gsarp.org or by contacting the authors at hkumpf3474@aol.com or ecoedgraphics@yahoo.com.

Invasive Species are described as exotic, alien, non-native, introduced, and a nuisance. There are several pathways/sources of invasives. Intentional pathways are by stocking, food importation, aquaria/pet stores, personal release, and property development. Non-intentional pathways are by ballast water, aquaculture, shipping, boat movement, and naturally.

Ecological impacts from invasive species include habitat degradation, food chain alteration, and competition with native species. Economic impacts include increased management costs, economic losses, and reduced natural productivity.

Invasive plants highlighted in the trunk include Kudzu (*Pueraria montana*), Chinese Tallowtree (*Triadica sebifera*), Water Hyacinth (*Eichhornia crassipes*), Hydrilla (*Hydrilla species*), and Salvinia (*Salvinia molesta*). Topics to be discussed are their native range, route of introduction, purpose/use, brief life history, and economic and ecological impacts. Invasive invertebrate animals highlighted in the trunk include Orange Cup Coral (*Tubastraea coccinea*), Green Mussel (*Perna viridis*), and Zebra Mussel (*Dreissena polymorpha*). Topics to be discussed are their native range, route of introduction, purpose/use, brief life history, and economic and ecological impacts. Invasive vertebrate animals highlighted in the trunk include Pacific Lionfish (*Pterois volitans/miles*), Burmese Python (*Python molurus bivittatus*), and Nutria (*Myocastor coypus*). Prevention, education, and observing and reporting are all ways to fight the spread of invasives.

Emens asked about the availability of the trunk and how its whereabouts are tracked. **Kumpf** stated that a Notice of Availability has been created. The trunk will be distributed at no cost and will be available for use for a maximum of 10 days. A reservation calendar with instructions on how to reserve the trunk will be created on the GSARP's website. Shipping of the trunk will be handled by the GSMFC office. **Ballard** stated that before the trunks are made available to the public, the GSARP's Education and Outreach workgroup is going to do a final review of all of the talking points that accompany the PowerPoint Presentation. Once this review is completed, the finished "Traveling Trunk" will be made available through the GSMFC. **Ballard** stated that his initial plan was to see how much interest the trunk generated. If enough interest and need is shown, he will proceed with obtaining items to produce additional trunks. **Jackson** stated that several Dade County teachers have expressed interest to him in getting the trunks for their classrooms.

Update on Penaeus monodon Activities

P. Kingsley-Smith gave a PowerPoint Presentation entitled "An Update on the Asian Tiger Shrimp, (*Penaeus monodon*). The native range of the Asian tiger shrimp is east Africa, Southeast Asia, Japan, China, Korea, Australia, Fiji, and the Philippines. They were first recorded in U.S. coastal waters off of Georgia in 1988 following the accidental release of approximately 3,000 of the shrimp from the SCDNR Waddell Mariculture Center. However, after their release in 1988, they were not seen in U.S. southeastern waters again until 2006. They are found in muddy and sandy bottoms and prefer depths from 0 m to 110 m. As juveniles, they occur in estuaries, and in marine waters as adults. *P. monodon* have several physiological tolerances. They have a salinity tolerance >10ppt, and a temperature tolerance approximately 13-33°C. Estimates of tolerance are preliminary for juveniles/adults, and testing of different life history stages is needed.

There are many concerns surrounding recent reports of *P. monodon*. The re-appearance of them in South Atlantic Bight was sudden and currently not well understood which causes fear. Based on the biology of *P. monodon* in its native habitat, the potential for its interactions with native penaeid shrimp in the southeast U.S. seems high. Interactions may be indirect such as competition for space, food, etc., or direct such as *P. monodon*'s diet in native habitat of shrimp and other crustaceans. *P. monodon* are potential hosts of viral diseases, which could possibly lead to transmission to native species. Reported collections of this species increased dramatically between 2010 and 2011. In 2010 there were a total of 32 collected. In 2011 there were 331 collected, with the majority coming from South Carolina and Louisiana.

Ballast water is one of the potential sources of *P. monodon* transport and delivery. The escapement of *P. monodon* in 2007from a Caribbean aquaculture farm due to Tropical Storm Noel, and the migration from wild Caribbean or African populations are other potential sources. One hypothetical mechanism for transport of *P. monodon* to the U.S. east coast is the entrainment of them from established populations in The Gambia via trans-Atlantic (North Equatorial) currents. This is consistent with reports of *P. monodon* in the southeastern region since 2006. Is there now an established breeding population of *P. monodon* somewhere along the southeastern U.S. coast? The answer will require more specimens and further genetic analyses.

Current efforts and future needs include: recognition flyers distributed to boat docks; more systematic data collection and reporting; size/weight/sex/condition data for specimens; standardized data recording cards to biologists; tissue collection, DNA sequencing, analysis. Microsatellites and single nucleotide polymorphisms provide sufficient markers for assessing phylogeographic and population genetic structuring among *P. monodon* collections from the southeast U.S. When people collect tissue samples, they are being asked to store them in 95% non-denatured ethanol. The samples are then submitted to the genetics lab for testing. When whole samples are collected, the first two pairs of pleopods are desired for testing. **Kingsley-Smith** stated that they have established a key point-person in each state who already works with the USGS database and coordinates the tissue collection and shipping process so that it stays manageable. More tissue samples are also needed.

REEF Lionfish Update

L. Akins gave a PowerPoint Presentation entitled "REEF Lionfish Update". **Akins** reported that lionfish are now invading the Gulf of Mexico and are a cause for concern. In the future, more work will go into assessing what is happening in the Gulf relative to lionfish. They are voracious predators and there is concern about the damage they can do to native ecosystems with that predation.

Recent publications have been released relative to lionfish. Topics include consumption rates, the decline in prey fish, climate changes affecting local control, sting paralysis, site fidelity, and diets.

Collecting/handling workshops were held in west Florida, southeast Florida, the Keys, and at the GCFI Conference. A collecting/handling workshop will be held in the Bahamas in May. REEF derbies will be held in Abaco, Palm Beach, Fort Lauderdale, Miami, and Key Largo, as well as many other international locations. The derbies do not control lionfish populations, but they are a valuable tool that provides a good opportunity to engage the community, teach people about the issue, provide samples for researchers, develop the market by allowing people to taste lionfish, and get people involved in collecting lionfish year round. The derbies are more of an outreach tool than a control tool.

Reports of lionfish sightings are being received daily and are primarily received via the internet reporting system. A phone app for reporting sightings is being developed. The app will also

allow access to recent reports and assist with targeting removal efforts based on those recent reports. **Akins** will report more on the app at the next GSARP meeting.

Akins stated that standardized reporting should be considered. All of the reports received by REEF go directly to the USGS and get incorporated into their NAS system.

The NPS Lionfish Response Plan has gone through extensive development.

A regional Best Practices Manual is being developed. There will be five primary chapters (Management Framework, Education/Outreach, Control, Monitoring, and Research). It is the first in a series of new books published through GCFI. It will be available this summer.

Akins reported that current research is underway that include a lionfish by-catch study in the lobster fishery; removal frequency in order to minimize the populations; microhabitat associations of lionfish and other competitor species; a target density model project that looks at how many lionfish a reef could support and how much effort it takes to maintain the lionfish population at a density; re-colonization and the impacts to the native fish community. Future research include acoustic tagging to look at movement and behavior; derby effectiveness; movement of lionfish; target densities.

There is still a lot of media interest in the lionfish issue. A NOS Podcast on lionfish will be out shortly. The lionfish cookbook has done well and there was recently a second printing of it.

Local control has proved to be effective. Populations of lionfish have been greatly reduced where removal efforts are being done on an active, ongoing basis.

Many local restaurants are offering lionfish on their menus. Local lobster fishermen are getting significant enough lionfish by-catch to supply the restaurants with them. One local lobster fisherman in the Florida Keys has caught over 6,000 lbs. of lionfish by-catch.

In the aquarium trade, there is a strong interest in supplying clients with local Atlantic lionfish instead of importing Pacific lionfish.

International training workshops will soon be held.

Internet-based training tools are being developed.

A regional strategy workshop will be held on regional strategy and development of a web portal as part of the GCFI.

Bonvechio asked **Akins** if he was familiar with studies being done on ciguatera toxin associated with lionfish consumption. **Akins** replied that researcher Bill Davin, an associate biology professor at Berry College in Mount Berry, Georgia, has been examining lionfish samples supplied by the Cayman Islands to see if they contain the naturally occurring toxin. **Akins** is not aware of the research findings, but pointed out that all fish caught for consumption where ciguatera is very prevalent could also contain the toxin.

Schmitz asked how many species there are of lionfish in the aquarium trade and if those species are also an invasion risk. **Akins** replied that there are approximately13. **Jackson** stated that there is an invasion possibility.

Teem asked if lionfish could be cultured in a lab and a full cycle of reproduction done. **Akins** replied that rearing lionfish in captivity has not been successful.

National Invasive Lionfish Prevention and Management Plan Update

Ballard reported that they made a recommendation to the ANSTF in May 2011to form a committee to explore the lionfish threat in the region and the need for a national lionfish control plan. The Task Force accepted the recommendation and formed the Invasive Lionfish Control Adhoc Committee. **Ballard** was elected Chairman. The committee presented a report to the ANSTF in the fall of 2011with a recommendation to move forward with a national control plan on lionfish and to include all other species in the trade instead of limiting it to the two species in the wild, and to address all species of lionfish known to be in the trade in the U.S. The ANSTF accepted the recommendation and the committee is now working on the draft of the National Invasive Lionfish Prevention and Management Plan. Working groups are being formed to draft the goals section of the plan and hopefully by the fall meeting of the Task Force, a completed draft will be presented to them for review and to vote on.

Akins added that, as part of this Plan, he is working on a section entitled "Regulatory Issues and Hurtles". He stated that he will be contacting panel members regarding what issues or regulatory policies currently in effect in their state may prohibit lionfish control and management.

AFS Southern Division Resolution on AIS State Plan and Panel Funding

Riecke was unable to attend the meeting, but copies of the AFS Division Resolution were provided in each member's folder. **Ballard** reported that the Resolution has passed the Southern Division and is moving on to the parent society of AFS, who will do an electronic vote. The Resolution has also been sent to Association of Fish and Wildlife agencies. The three marine commissions are also sending it through. All approved state plans will receive one million dollars yearly, and all six of the regional panels will receive one million dollars yearly.

Ornamental Zooanthids & Palytoxin: Importing Without Oversight and Risk to Consumers and Environment as a Potential Invader

Jackson gave a PowerPoint Presentation entitled "Ornamental Zooanthids & Palytoxin: Importing without Oversight and Risk to Consumers and Environment as a Potential Invader". From the 1950's to the early 1980's, the pet industry influx was a "static" industry made up of importers, wholesalers, and dealers (pet shops). For the most part, it was supply-driven. If someone wanted to purchase a pet, they had to actually go to the pet shop or live near an importer. In the 1990's, overnight shipping and global shipping were available. Next came the internet, and pets could be purchased online and shipped to the purchaser overnight. Hobbyists and the pet industry created blogs. Specialty internet sites were created. The pet industry went from *supply* driven to *demand* driven.

Jackson next reported on Orange Cup Coral (*Tubastraea coccinea*). It is believed that orange cup coral entered Atlantic waters as a fouling organism in shipping. It was first identified in 1943 in Curacao and Puerto Rico and can inhabit both shallow and deep habitats. *T. coccinea* is highly toxic and produces allelopathic chemicals that are toxic to neighboring native corals. Populations of *T. coccinea* have been observed on artificial reef habitats in Florida. It readily settles on newly available artificial substrates, exhibiting high survivorship and growth rates. In the aquarium trade, it is sold as an ornamental. It easily reproduces in captivity.

An ornamental group of Pacific organisms called zooanthids is entering the ornamental trade. Pacific zooanthids are highly marketable because of their bright multi-colors and their ability to easily reproduce. On the other hand, Atlantic zooanthids are not colorful and have not been a target of sale. **Jackson** reported that he learned that zooanthids are potentially dangerous in an article he read in *Coral* magazine in 2010. The article cautioned readers about handling zooanthids because "many Palythoa spp. zooanthids contain a highly toxic, potentially deadly toxin know as palytoxin (PTX). Zooanthus spp. haven't yet been confirmed to contain this toxin, but caution should still be applied". The article advised readers to wear gloves and eye protection and to wash their hands afterwards with warm, soapy water.

Palytoxin is one of the most toxic non-peptide substances known. Just 9ug can kill a 140lb. person. It operates at the sub-cellular level, affecting the transmembrane sodium pump into a non-specific "open only" ion channel, causing an increase in internal calcium and cell death. It is produced by dinoflagellates and can bioaccumulate via the food web. It is significantly toxic to vertebrates and anthropods (crustaceans, etc.). It is unknown how long zooanthids retain palytoxin, but cultured zooanthids have been found to continue to contain it. Is it bioaccumulated from consumption, or is it produced by an intrinsic dinoflagellate? More investigation is needed to examine the length of time the palytoxin is retained. Zooanthids are being sold with no oversight as to their toxicity, and no required handling guidelines. Poisonings, but no deaths, from palytoxin exposure via aquariums have been reported. The solution to this would be to require safe handling guidelines at all points of sale.

Jackson stated that intentional or unintentional release of zooanthids onto reefs could introduce a new organism that harbors toxin. The zooanthids could then be consumed by sea turtles. There could also be a change/increase of bioaccumulation on the food change, thereby being another risk to human health.

Public Comment

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

The meeting recessed at 5:00 p.m.

Wednesday, April 4, 2012

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

Discussion of Coast Guard's Final Rule on Ballast Water

P. Carangelo was unable to attend the meeting, but submitted a written report on the Coast Guard's final rule to establish a numeric standard for living organisms in ships ballast water discharged in U.S. waters that was published in the Federal Register. **Ballard** included the report in each member's folder and discussed the final rule. For informational purposes, **Ballard** asked the Task Force if the GSARP could make comments or recommendations to the Federal Register as an organization, and the Task Force said no. Comments and recommendations regarding the final rule can only be made at GSARP meetings and through state agencies. **Carangelo** wrote that the final Coast Guard rule sets a standard that is consistent with the standard set in the International Maritime Organization (IMO) ballast water treaty. The rule will go into effect "on or about June 20". The standard is consistent with recommendations made by the National Academy of Sciences and the Environmental Protection Agency (EPA) Science Advisory Board in terms of what is technologically achievable right now and for the reasonably foreseeable future.

Carangelo wrote that he has consistently stated to the Regional Panel that he feels the U.S. should adopt the IMO numeric criteria, which is now officially proclaimed in the final rule. The final rule states that "setting the numeric, concentration-based ballast water discharge standards in this final rule is the best approach to reducing the threat of the introduction and spread of NIS into the waters of the United States".

Carangelo wrote that the Coast Guard rule is an important step in unifying regulation of ballast water, which is currently regulated by the Coast Guard, the EPA, and state agencies under various statutes. The EPA is currently revising its Vessel General Permit (VGP), which is how the agency regulates ballast water under the Clean Water Act, and it may choose to set a standard consistent with the Coast Guard standard.

Carangelo's recommendation to the Regional Panel and state panel members has been and continues to be that were they to consider promulgating a state numeric standard for ballast water, that it should mirror the IMO standard that is now the USCG's final numeric discharge standard and implementation schedule.

State Reports

Alabama

Newton reported that several invasive species have been documented in Alabama waters. The Bocourt swimming crab (*Callinectes bocourti*), tessellated blenny (*Hypsoblennius invemar*), Australian spotted jellyfish (*Phyllorhiza punctata*), and Asian green mussel (*Perna viridis*), have recently been spotted. Prey of Australian spotted jellyfish include early life history stages of many commercially and recreationally important finfish. The temporal/spatial distribution of Australian spotted jellyfish could drastically increase finfish larvae/egg mortality rates if spawning events coincide with swarm activities. Similarly, the Bocourt swimming crab could compete for resources of the native blue crab. However, the current status of the Australian spotted jellyfish and the Bocourt swimming crab does not indicate that these two invasive species pose an imminent concern. Two invasive species of heightened concern are the giant

tiger prawn (*Penaeus monodon*) and the lionfish (*Pterois volitans/miles*), and their distribution warrants investigation.

The giant tiger prawn (*Penaeus monodon*) has been a species of concern since 2006 when it was first observed in Alabama's inshore waters of the Mississippi Sound. After the first tiger prawn was documented, captures of *P. monodon* have incrementally increased. From 2006 to 2009, their distribution was primarily restricted to Alabama's southern inshore waters. However, in 2011, distribution extended to northern Mobile Bay and into Perdido and Wolf Bays. The 43 confirmed reports during 2011 indicate the giant tiger prawn has become established in all of Alabama's primary estuary basins. This has caused a shift of the focus of the Marine Resources Division management agency from documenting the occurrence, to characterizing the population structure and processing samples for genetic investigation. Male specimens recovered ranged in length from 154mm to 251 mm, while female lengths ranged from 141mm to 284mm.

The first report (non-validated) of lionfish was in 2009 by a recreational scuba diver 16 miles south-southeast of Orange Beach at an area of natural hard-bottom referred to as the Trysler Grounds. The first confirmed report was documented in June 2011 by a spear fisherman who collected a lionfish from an oil/gas platform approximately 43 miles south of Dauphin Island. Lionfish are now abundant on Trysler Grounds, and inhabiting oil/gas platforms at low densities. They have also been reported in inshore waters and within Alabama's territorial seas.

The DCNR/MRD has increased efforts to enhance public awareness of these two invasives. An invasive species page has been added to their website. A notification that describes the giant tiger prawn and provides information concerning proper reporting has been distributed to the shrimping community. Also, a page in the 2012 Alabama Marine Information Calendar is dedicated to educating the public about the giant tiger prawn and the lionfish. The calendar is distributed to a variety of establishments where it becomes readily available to DCNR/MRD constituents. The DCNR/MRD has contacted the Mobile Jaycees about adding a lionfish category to their deep sea fishing rodeo. The Gulf Coast Divers group has been contacted about shooting lionfish on sight and possibly holding a derby.

Teem asked if there was any evidence of diseases caused from *P. monodon*. **Newton** explained that they have not seen any evidence in Alabama waters.

Rider reported that a third population of Island Apple Snails (*Pomacea insularum*) was discovered by a conservation officer in a private pond in Coffee County in southeastern Alabama. The officer noticed large snail shells that raccoons had been feeding on. The local fisheries biologist was contacted and he verified the species. Also noticed were two locations where pink eggs were attached to stumps protruding from the water. The pond drains into an intermittent unnamed tributary of the Pea River. Two copper sulfate treatments 10 days apart were applied from mid to late November. Local biologists plan on sampling the pond within the next few weeks to assess the treatment.

In February, **Rider** received a phone call from a congressional aide of Senator Sessions regarding Apple Snails and ANS issues that the Senator was interested in. He requested a

meeting and sight visit. After his visit, the aide emailed a request for additional information and literature.

There is no longer an aquatic plant program in Alabama, even though it is their biggest ANS issue. This program will not be reinstated.

The first population of Island Apple Snails found in Alabama continues to spread. Biologists from local districts have been continually spraying vegetation and applying copper sulfate to control their spread; however, pink eggs far downstream less than 0.5 miles from where Three Mile Creek enters the Mobile River were observed on March 7, 2012.

A Banded Leporinus (*Leporinus fasciatus*) was caught by an angler from a city park pond in Montgomery. Blueback Herring (Alosa aestivalis), a prohibited species in Alabama, have been confirmed in Lewis Smith Reservoir. Striper anglers are more than likely to blame for this illegal introduction. Several Bighead Carp have been caught by anglers in the Tombigbee River.

Schmitz asked which aquatic invasive plant species are of concern in Alabama. **Rider** replied that milfoil and hydrilla are a problem, as well as Cuban bulrush, which is moving up the Tombigbee River.

Florida

Schmitz reported on *Phragmites* in Florida. *Phragmites* is a tall, perennial, wetland grass that occurs in both fresh and brackish waters. North American *Phragmites* can be divided into three genetic lineages; native North America types, a Gulf Coast type, and a Eurasian type. The native types are found in the northeast, Midwest, and western USA, but not in the southeast. The Gulf Coast lineage occurs widely from the Atlantic Coast of Florida, along the Gulf Coast from Florida to Texas and south into Mexico and Central and South America. The Eurasian lineage was introduced into Philadelphia with ships ballast in the 1800s, and has become increasingly abundant and widespread in North America. It is now the dominant type along the Atlantic coast from Georgia northwards, and has moved into the Midwest, the Mississippi River Delta, and western states. A 2009-2010 *Phragmites* survey conducted in coastal areas from South Carolina to Louisiana did not find Eurasian plants in Florida. However, populations of Eurasian *Phragmites* were identified in Louisiana, Mississippi, South Carolina, and Georgia. Due to the proximity of the Eurasian type to Florida, it would seem likely that it will eventually invade the state.

There are reports of prolific seed production in some populations of *Phragmites*, but in the Gulf Coast, little or no seed production has been observed. *Phragmites* spread through the growth of rhizomes, and it is thought that the majority of spread within a population is due to clonal growth. How Gulf Coast *Phragmites* became so widespread in the southeastern U.S. with little or no seed production is unknown.

The Eurasian type of *Phragmites* has proven to be a highly aggressive invader, particularly in the northeastern and mid-Atlantic states, where it has largely displaced native *Phragmites*. A study conducted in the Mississippi River Delta in Louisiana demonstrated that the exotic type can out-compete the Gulf Coast type. If the exotic *Phragmites* invades Florida, it may have the potential

to displace Gulf Coast *Phragmites* and other wetland plants. Gulf Coast and Eurasian *Phragmites* are morphologically distinct, and can be separated by stem structure, panicle form, and stem color.

Schmitz discussed **Scott Hardin**'s written summation of his ongoing three-year study on introduced *Pomacea*. **Hardin** recently retired from the FWCC and will no longer serve on the GSARP panel. The final report is forthcoming, but some conclusions are worthy of note.

Plant species typically used in restoration activities such as bulrush, water lily, spikerush, Canna, arrowhead, spatterdock, and eelgrass are readily consumed by exotic *Pomacea*, particularly new growth of emergent macrophytes. Exotic apple snails will move to depths greater than 6.5 m to obtain food. The status of exotic *Pomacea* populations in areas earmarked for restoration should be determined prior to planting, and plants should be tall enough to have stems and/or leaves above the waterline at the time of planting. Exotic *Pomacea* consume roots of many plant species; therefore, leaving roots exposed during restoration planting provides an opportunity for snails to damage/kill plants. To minimize damage to restoration areas where exotic *Pomacea* are present, multi-species plantings are recommended.

Substantial impacts from exotic apple snails in large lake and marsh systems have not been observed. An extensive predator base (alligators, wading birds, fish, turtles, etc.) is probably at least partially responsible for controlling exotic apple snail populations in large freshwater ecosystems. Impacts seem to be limited to small ponds, including storm water retention ponds, in part because of palatial plant species present as well as a lack of apple snail predators. Research to assess potential impacts of *P. insularum* on the native *P. paludosa* in controlled laboratory situations has shown that the exotic apple snail outlives the native Florida apple snail. However, lab and mesocosm studies have not been inconsistent with observations in larger natural systems that suggest so-occurrence without impacts to native or exotic apple snail populations.

Control and possible eradication can be achieved in urban systems, or small systems with easily accessible shorelines, through a hand removal program in which snails and egg masses are removed on a regular basis (e.g., weekly or monthly). Eradication attempts in large, eutrophic Florida lakes will most likely be unsuccessful, and are not recommended because of the prolific nature of the snails, their ability to spread rapidly over large areas, their physiological tolerances, and potential impacts of treatments to non-target organisms. Eradication attempts using copper sulfate are not recommended. Copper sulfate treatments have not been successful in controlling exotic apple snails and can result in substantial impacts to non-target organisms.

Florida FWCC was notified by the Idaho State Department of Agriculture about two boats that had been on Lake Mead and were destined for Florida. Even though the boats had been inspected and treated in Nevada for quagga mussels, the effectiveness of the hot water treatments has not been consistent. One of the boats was to be dry-docked, but the owner was contacted by FWCC's invertebrate specialist and asked if the boat could be inspected. During the initial inspection, no evidence of quagga mussels was found in the bilge pump, bilge pump drain line, hull, water intake ports, or exhaust ports. However, during a second inspection, dead quagga mussels were found in the air conditioning system. The mussels were present in a water filter

through which water from outside the boat passes en route to a heat exchanger that cools the compressor. The unit was located beneath the deck inside the hull of the boat. It was felt that the mussels were likely not killed during the treatment, but from the boat being in transit for several weeks. The second boat arrived in Florida, but the owner was contacted and revealed that the boat was docked in saltwater in the Lower Keys and so posed no threat of infestation. This is an excellent example of a cooperative rapid response approach to head off potential threats.

Teem briefly reported on the rat lung worm. The rat lung worm has not been found in apple snails. A new snail, the giant African land snail, has appeared in Miami. Samples from the giant African land snail have been studied by **Teem** and no evidence of rat lung worm was found in those samples. However, it could be an issue in the future, since snails are a host for the rat lung worm. **Teem** explained that the rat lung worm is a nematode that infects both rats and snails and is a parasite that is normally found in Asia, but now exists in Louisiana. Humans who consume infected raw snails can contract eosinophilic meningitis, an inflammation of the membranes surrounding the brain.

Schmitz commented that he noticed that Florida Department of Agriculture workers who were removing the African land snails wore gloves and asked **Teem** if it was for protection from rat lung worm. **Teem** explained that it was, as the nematode can also be transmitted through the slime of the snails.

Schmitz asked what the status is of the removal effort of the giant African land snail. **Teem** explained that there are 14 core locations in Miami that they are aware of where the snails are present, and they are treating the locations with Molluscicides and monitoring the locations. Approximately 30 thousand snails have been removed. The fear is that the snails will eventually invade the Everglades and numerous Florida cities, and eradication will be virtually impossible.

Schmitz told the panel about a free iPhone app called "I've Got One". It is produced by the University of Georgia's Center for Invasive Plants and lists invasive animal and plant species in Florida.

Schmitz briefly spoke on the Everglades Cooperative Invasive Species Management Area (ECISMA) newsletter that he is Editor of. The newsletter highlights present control efforts and projects for invasive animal and plant species.

Kingsley-Smith asked what the status was of AVM research. **Ballard** stated that he has spoken to Rebecca Haynie, a researcher from UGA who gave a presentation on AVM at the last GSARP meeting, and there are new findings from their research. She will attend the next GSARP meeting and share the findings with the panel members.

<u>Georgia</u>
Bonvechio stated that they plan to submit a funding proposal for their ANS plan to the ANS Task Force.

Bonvechio reported on the Satilla River Flathead Removal Project. The presence of illegally introduced flathead catfish (*Pylodictis olivaris*) was first observed in 1996. During the mid-2000s, declines in the abundance of redbreast sunfish (*Lepomis auritus*) and bullhead catfish (*Ameirus spp.*) coincided with significant increases in the abundance of flathead catfish. The Satilla River has historically been one of the premiere sunfish fisheries in Georgia, with redbreast sunfish being one of the most sought-after species. In an effort to negate the impacts on native fish populations, existing Wildlife Resources Division (WRD) Waycross Fisheries staff began aggressive removals of the flathead catfish via electrofishing in 1996. Despite these removal efforts, the number and size of flathead catfish continued to increase. In 2006, the Georgia legislature appropriated funding for three new personnel (reduced to two in 2009) who were assigned the task of reducing the flathead catfish population levels through direct removal while searching for a long-term population control.

Crews removed 3,469 catfish for the 2011 sampling season (May-October). More than 23,000 fish have been removed since the implementation of the full-time flathead management program in 2007. The size structure of the population has declined, with the average size fish dropping from 5.8 lbs. in 2007 to 2.7 lbs. in 2011. In addition, the average length fish has fluctuated from 512 mm TL in 2007 to 354 mm TL in 2011. Age structure has also changed. In 2007, 15% of the population was made up of age-1 & age-2 fish. In 2009, the age-structure data revealed a typical population that had received high exploitation, characterized by over 80% of the fish being age-1 or age-2, and only 3% of the population being age-6 or older. In 2011, the age-structure appears to be rebuilding. Only 66% of the fish are age-1 or age-2, 22% are age-3, and 12% are age-4 or older. There also appears to be a compensatory shift in sexual maturity due to a decade of increased exploitation.

Water levels appear to affect recruitment. During the drought years, catch rates (CPUE) were down, but were considerably higher in the high water years of 2009-2010.

Maintenance control and/or suppression of flathead catfish in the Satilla River is possible, given the reported changes in biomass, size, and age-structure, but higher recruitment and earlier maturation was demonstrated. As a result, this will require intensive maintained harvest to prevent the population from rebuilding within 2-5 years.

During sampling in 2011, the WRD removal crew documented the non-indigenous range expansion of the Blue Catfish (*Ictalurus furcatus*) in the Satilla River. Seven catfish were recovered this season. This is the second non-native riverine catfish to be found existing in the Satilla River basin.

Coastal Georgia is forming a Cooperative Invasive Species Management Area (CISMA). A meeting was held in March

The USFWS at the Warm Springs Fish and Technology Center are in the process of developing eDNA markers for field use for ANS. They are currently working on bulls-eye snakehead, Mayan cichlid, and African jewelfish.

Teem asked about the flathead catfish triploid program. **Bonvechio** replied that a lack of funding and a cut in the annual budget are the main obstacles to the program.

Louisiana

R. Bourgeois reported that LDWF treated 57,218 acres of nuisance aquatic weeds in fiscal year 2010-2011. Decreases in coverage of these plants (except giant salvinia) are the result of a combination of LDWF control efforts and cold winters in 2009-2010 and 2010-2011.

In past years, the US Army Corps of Engineers (USACE) has provided approximately 30,000 acres of annual aquatic plant control in south Louisiana. Their Removal of Aquatic Growth Program did not receive funding for future efforts, and their plant control program ceased operation in December 2011.

Since 2006, giant salvinia has been a major focus of aquatic plant control efforts in Louisiana. In Lake Bistineau, water fluctuation and herbicide applications have reduced giant salvinia to approximately 150 acres. In Turkey Creek Lake, strategic boom placement to restrict plant movement, a drawdown, and a fluoride treatment have reduced giant salvinia to approximately 50 acres. In Toledo bend, the recent drought and a drawdown have drastically reduced the amount of giant salvinia present.

LDWF continues to train interested members of the public in spraying. Three training sessions have been held in the Lake Bitineau area, with over 100 attendees. As long as the public continues to show interest, these training sessions will be held.

A large effort is being made for better public outreach/education. Joint booths with LDWF Aquatic Outreach section have been put up at boat shows and the Bassmaster Classic. New brochures/handouts have been printed on Northern Snakehead vs. Bowfin. LDWF is taking full advantage of facebook. Brochures, links, and articles about ANS species/concerns are being posted, as well as information on tiger prawn and northern snakehead.

Following the 2011 flooding of the Mississippi River, Asian carp have located in a few new water bodies in both northern and southern Louisiana. Biologists continue to track their progression throughout the state.

Mississippi

R. Burris reported on DMR's coordination and outreach activities. An existing part-time invasive species ecologist has been hired to take on the additional role of part-time aquatic invasive species coordinator as per the Coastal Impact Assistance Program (CIAP) project objective.

DMR met with reviewers of the Draft Mississippi State Management for Aquatic Invasive Species, and assisted the MS Aquatic Invasive Species Task Force Co-Chairman in incorporating reviewers' comments and editing the prohibited species list.

At the first Northern Gulf interagency multi-state, invasive "Lionfish Strike Force" planning meeting, DMR participated as a charter member.

Interviews were given to reporters from WLOX television station, the Sun Herald newspaper, the Mississippi Press newspaper, the Mississippi Business Journal, and the Sea Coast Echo newspaper about the Asian tiger shrimp and lionfish invasions. The stories appeared in each of these media outlets, resulting in increased public awareness about the problem with aquatic invasive species.

Literature was provided about giant salvinia, lionfish, Asian tiger shrimp, and silver carp invasions for distribution to Mississippi legislators during Capital Day.

Forms and procedures were developed to comply with new NPDES (National Pollution Elimination System) permit regulations regarding the application of herbicides/pesticides in aquatic environments.

Tissue samples from Asian tiger shrimp were preserved and sent to the NOAA laboratory for population genetic analysis.

An article about invasive lionfish in the Northern Gulf of Mexico was produced for an upcoming issue of MDMR's quarterly newsletter *Coastal Markers*.

The "Aquatic Invasive Species Status Update" was presented at the DMR Commission meeting.

Six hundred "Invasive Asian Tiger Shrimp" decals were produced and distributed to licensed shrimp fishermen and seafood processors to aid in accurate identification and to encourage reporting of this new exotic shrimp species.

Distribution of "Invasive Lionfish" decals to dive shops to aid in identification and to encourage reporting of this new exotic fish species has continued.

Silver Carp flyers have been distributed to local sporting goods stores.

DMR reps attended National Invasive Species Awareness Week meetings and activities in Washington, D.C.

Twenty field surveys totaling 279 miles were conducted for early detection of AIS.
An aerial photo survey totaling 117 miles was performed to aid in the early detection of AIS. As a result of this aerial survey, a previously undetected accumulation of giant salvinia was found in the Pascagoula River marsh. Treatment of this patch is underway.

Eleven sightings of invasive Asian tiger shrimp were reported to the NAS database. Information and specimens were given to DMR by local fishermen.

Five herbicide applications were applied to giant salvinia on the Pascagoula River. Two herbicide applications were applied to common salvinia in Bogue Houma in the Pearl River, and Robinson Bayou in the Pascagoula River. Three herbicide applications were applied to cogon

grass on Deer Island. One herbicide application was applied to Brazilian waterweed in a residential runoff collection pond that discharges directly into the Tchoutacabouffa River.

Dennis Riecke was unable to attend the meeting, but provided a written report. The prohibited, restricted, and approved species lists in the Mississippi State Management Plan for Aquatic Invasive Species were reviewed and updated.

A letter of support for funding was written for the USGS ANS database.

At the annual meeting of SDAFS, **Riecke** presented the SDAFS *Resolution on the Federal Funding for Programs to Prevent, Control, and Manage Aquatic Invasive Species* to the SDAFS members. The Resolution was approved, and the members voted to send it to the AFS Resolutions Committee. The Resolution has not yet been distributed to federal congressional representatives in the SDAFS states. The approved Resolution is under committee review, and **Riecke** expects it to be approved for submittal to the national AFS members for a vote in the next few months. It has been amended to include an additional 2 million dollars; 1 million for the zebra/quagga mussel control plan, and 1 million for the USGS ANS database.

The *Mississippi State Management Plan for Aquatic Invasive Species* has undergone state review and public comments were received. It was sent to the National ANS Task Force in January 2010 for their review and extensive comments were received. The MS Department of Environmental Quality will soon be submitting the plan to the National ANS Task Force for approval.

Riecke represented the MS Department of Wildlife, Fisheries and Parks on the MS Aquatic Invasive Species Task Force.

"Stop Aquatic Hitchhikers" cards are continuing to be printed and distributed to boat owners when their boat registrations or renewals are mailed out.

The "Stop Aquatic Hitchhikers" logo and bullet list are continuing to be printed in the *Mississippi Outdoor Digest* and *Guide to Mississippi Saltwater Fishing*.

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

The yellow plastic "Stop Aquatic Hitchhikers" posters are being used by MS DWF boat ramp construction crews for posting on boat ramp access signs.

The activities specified in the MS State Management Plan for Aquatic Invasive Species will be implemented.

Freshwater fishing bait regulations to specify what bait can be legally sold, possessed transported, and used in MS will be composed. Revisions to a state law were drafted and

submitted, but it was decided that no agency-sponsored legislation for the 2012 legislative session will be presented.

Licensing of retail bait outlets that sell live freshwater fishing bait will be pursued. Draft regulations have been composed.

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 will be adopted. The list of approved, restricted, and prohibited species as specified in the public notice that regulates aquaculture activities in MS will be amended. State ANS Task Force members approved this list.

The MS Department of Marine Resources secured MS Coastal Impact Assistance Program funding to hire a Conservation Resource Biologist, Mike Pursley, under a 4-year contract to form an Aquatic Nuisance Species Advisory Council. This Biologist will begin implementation of action items contained in the MS State Management Plan for Aquatic Invasive Species.

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

Information for MS contacts listed in the Expert Taxonomic Database will be updated and expanded.

All reports of nonnative species collected from field reports over the last several years will be sent to the USGS.

North Carolina

R. Emens stated that he manages the NC DENR's Aquatic Weed Control Program. The program provides assistance to units of local government, public utilities, and miscellaneous state agencies that are plagued by aquatic weeds which are recognized by the department as being noxious. The majority of the program funding goes toward hydrilla control.

Emens reported that over the last three years, funding has been reduced by approximately 40%. Several positions have been eliminated, and travel authorizations for attending meetings have been cut.

A small population of giant hydrilla that was persistent in NC for over a decade has recently been extricated.

A "Stop Aquatic Hitchhikers" guide is being distributed to specifically target boaters.

A hydrilla "hunt" card is being distributed. The card has identification pictures and information on why hydrilla is an invasive plant. There is a tear-off section that can be filled out with a person's name and the location of where hydrilla was located. A hydrilla sample can be submitted along with the card to North Carolina State University.

A state-wide ANS plan has not been developed yet. Grant money will be applied for in order to secure the services of a firm to write a plan.

Kumpf asked the panel members to submit their state's outreach materials in printed form to **Ballard** to include in the "Traveling Trunk".

South Carolina

P. Kingsley-Smith reported on the impacts of the invasive swim bladder parasite, *Anguillicoloides crassus* (Phylum Nematoda) on populations of the American eel, *Anguilla rostrata* in South Carolina estuaries. American eel populations in South Carolina estuaries have been in decline since at least 2001. A potential contributing factor to the decline is the *Anguillicoloides crassus* that infects the eel's swimbladder. *A. crassus* is endemic to East Asia, where it infects the Japanese eel without causing serious pathology; it is, however, extremely pathogenic to other eel species. *A. crassus* was first reported in the U.S. in 1995 in an aquaculture facility, and in 1996 it was recorded for the first time in wild U.S. American eel populations in Winyah Bay, South Carolina. *A. crassus* has since been reported in American eels along the Atlantic coast.

The goal of the present study on the impacts of *Anguillicoloides crassus* is to survey the presence and health effects of *A. crassus* on *A. rostrata* populations in two National Estuarine Research Reserves (ACE Basin NERR and the North Inlet-Winyah Bay NERR), and to compare them with anthropogenically-impacted areas of Winyah Bay and the Cooper River. Eels were collected between January 2011 and January 2012 to determine the prevalence and intensities of *A. crassus* at each site. Swimbladder damage was evaluated to determine whether infection by *A. crassus* was associated with any discernable effects on host health.

Prevalence of infection in the eels showed no significant difference between the four sites. Further analysis revealed that salinity has a significant effect on mean intensity, with mean intensity significantly increasing at higher salinities. Overall prevalence of infection was 46%. Eels < 300 mm had a higher prevalence of infection than eels > 300 mm. Eels at higher salinity sites had higher intensities of infection than eels collected at lower salinity sites.

Kingsley-Smith next reported on the impacts of the Asian seaweed, *Gracilaria vermiculophylla*. During the last decade, it has rapidly proliferated along high-salinity mudflats in several South Carolina and Georgia estuaries. Using next-generation sequencing, microsatellite loci have been developed for *Gracilaria vermiculophylla* that will allow the route by which it invaded estuaries worldwide to be reconstructed. Domestic samples along the east and west coasts of the U.S. will be collected for genetic comparison this summer.

Next discussed was the increase of Asian tiger shrimp (*Penaeus monodon*), catches from the southeast region. Ongoing monitoring of the Asian tiger shrimp has revealed a notable increase in the number of shrimp collected along the U.S. southeast coast in 2011. A total of 331 shrimp were collected from the region in 2011, compared to 32 in 2010. Reports have ranged from North Carolina to Texas. A greater diversity of habitats has been observed, specifically including near-shore estuarine habitats from which *P. monodon* reports prior to 2011 were rare.

In March 2012, the presence of *P. monodon* in seagrass habitat in Discovery Bay, Jamaica was confirmed.

A growing working group of collaborators from the SC DNR, USGS, NOAA-NMFS, and TPWD continues to coordinate reports of *P. monodon*, standardize data collection, and increase the acquisition of tissue samples for genetic analyses. A tiger shrimp tissue repository has been established at the NOAA-NMFS laboratory in Beaufort, NC. It is hoped that these genetic approaches will help to answer questions surrounding the geographic origin(s) of this recent invasion, as well as its temporal and spatial dynamics. D. Knott and others have compiled a comprehensive list of literature on *P. monodon*, including information on its general biology, reproduction, diseases, genetics, and aquaculture history.

Kingsley-Smith provided a lionfish update from MARMAP (Marine Resources Monitoring, Assessment and Prediction Program) data from 2011. MARMAP is a fishery-independent collaboration between the SC DNR Marine Resources Research Institute and NOAA Fisheries. Approximately 600 sites are sampled each year from Cape Hatteras, North Carolina to Cape Canaveral, Florida between May and September using the R/V Palmetto. Targeted areas are live bottom (sponge, soft coral, algal growth), rocky outcrops and reef habitat on the continental shelf, shelf edge, and continental slope. In 2011, MARMAP collaborated with the Southeast Fishery-Independent Survey (SEFIS) to collect lionfish images, and processing of the video should be completed in a few months. More information on 2011 lionfish observations by MARMAP researchers will be presented at the fall 2012 GSARP meeting.

C. Page reported that they have completed their annual state Aquatic Plant Management Plan and it is posted on their website.

Hydrilla continues to spread in the Santee Cooper lake system. Three years ago there were 800 acres of hydrilla; there are now over 4,000 acres. Thurman Lake now contains over 7,000 acres of hydrilla.

Outreach activities were done at The Southeast Wildlife Expo in Charleston and the Palmetto Sportsman's Classic in Columbia.

Measuring cups have been created with a "Protect your Waters" logo. Printed on the cups are instructions on how to disinfect boat live wells.

Texas

L. Hartman reported that the *P. monodon* issue has been featured in the news, which has helped their outreach efforts.

E. Chilton reported that to date, adult zebra mussels have been found only in Lake Texoma and Sister Grove Creek, although zebra mussel DNA has been detected at a number of other locations.

The budget for aquatic invasive plant management currently stands at about $0.7 million, as opposed to $1.7 million in FY 2011.

Giant hydrilla has been found in Lake Livingston, a 90,000 acre reservoir.

TPWD successfully submitted all necessary materials to comply with new National Pollutant Discharge Elimination System regulations.

The Texas Aquatic Nuisance Species Management Plan was submitted to the Governor's office and is awaiting his approval.

Notice of a new Guidance Document for Aquatic Vegetation Management in Texas was recently published in the Texas Register for a public comment period. The document should go into effect early this summer.

A zebra mussel awareness campaign is scheduled for May, June, and July 2012.

Dr. Shiyou Li, research professor of the Stephen F. Austin State University's National Center for Pharmaceutical Crops (NCPC) has now discovered that chemical compounds from giant salvinia can effectively inhibit growth of cancer tumor cells with minimum damage to normal cells. To date, more than 30 different compounds, including four new compounds, have been isolated from the giant Salvinia. TPWD has been collecting and supplying salvinia to Dr. Li.

Teem asked about salvinia weevils as a means of salvinia control. **Chilton** replied that two salvinia weevil production facilities have been built.

Members Forum

Bonvechio asked what they could do as a panel about the invasive ornamental aquatic issue. **Schmitz** stated that at a past meeting, it was decided that a "watch list" of potential invasive plant and animal species should be created. The watch list would also include ornamentals.

Ballard explained that the GSARP is a working arm of the National Task Force and therefore, can make recommendations to the National Task Force as to what GSARP feels the Task Force should be doing that affects this region. **Ballard** suggested that as a panel, GSARP can make the recommendation to the Task Force that they should address the ornamental issue. A general recommendation can be made at the upcoming spring meeting, or a formal session can be held at the next GSARP meeting to address the ornamental issues, and a well-rounded recommendation can be created and then presented to the Task Force at their annual fall meeting in Washington.
It was decided that a formal session would be held at the next GSARP meeting to address the ornamental issue, and a well-rounded recommendation would be created. It will then be presented to the Task Force at their annual fall meeting in Washington.

Kumpf suggested utilizing a previously created "watch list" from 2000 and adding species to that list.

Hartman reminded the panel that at the last meeting, **Herod**, **Jacoby** and **Schmitz** all volunteered to serve on a work group to create a watch list that would be incorporated into the Rapid Response Plan. **Hartman** was elected to head the work group.

National Park Service Activities - C. Furqueron reported on National Park Service activities. The Park Service has been working since last spring on developing a Lionfish Management Plan. Lionfish have been documented in seven parks.

A workshop was held in Miami last September. Twenty-nine people participated. Representatives from NOAA, REEF, state agencies, and the Park Service attended. A plan was developed that focuses on lionfish management to protect and maintain the park ecology, cultural resources, and visitor experience. Also, to identify research opportunities with park partners.

The Plan went through several reviews and has now been published. It is available on the Park's website at www.nature.nps.gov/water/marineinvasives/lionfish.cfm.

An Asian swamp eel project is being worked on at the Chattahoochee River National Recreation Area in Atlanta, Georgia.

Hydrilla is in the Obed Wild & Scenic River.

D. Britton reported that there are some positive developments regarding zebra mussels in north Texas. At the last GSARP meeting, **Britton** reported on the discovery of zebra mussels in Lake Texoma in 2009 which led to the North Texas Municipal Water District's (NTMWD) decision to discontinue pumping water from the lake into the Trinity River Basin. Despite these efforts, zebra mussels were then found in Sister Grove Creek. In February 2011, The Tulsa District USACE suspended the DA permit to transfer water from Lake Texoma into the Trinity River Basin. In August 2011, NTMWD submitted a proposal to USACE to resume pumping water into the Trinity River Basin. As of October 2011, the pipeline remains closed, awaiting USACE authorization. **Britton** announced that the USFWS has been working closely with NTMWD and the USACE to formulate a reasonable plan that would prevent zebra mussels from being introduced into the Trinity River Basin. **Britton** also announced that a proposal previously deemed too costly by the NTMWD in which the pipeline that pumps water from Lake Texoma into the Trinity River Basin would be rerouted through a water treatment facility has now been approved, and the project should be completed by July 2013.

The development of a "Train the Trainer" course that **Britton** suggested at the last GSARP meeting has been canceled due to lack of funding and other issues. However, he is hopeful that it will come to fruition in the future.

An Interagency Giant Salvinia Control Team meeting will be held shortly and **Britton** invited panel members to attend. Information can be obtained from salvinia.org, which is the website for the Giant Salvinia Control Team.

Kumpf commented that there will be a review of the "Traveling Trunk". **Ballard** will email the Talking Points to the members of the Education/Outreach Committee. Reviews should be sent to **Ballard** within 7-10 days. **Kumpf** thanked the panel for their support and assistance with the "Traveling Trunk".

Update on New Introductions

M. Cannister gave a PowerPoint Presentation entitled "GSARP Species Updates". A Nile tilapia was identified in an unnamed lake near Hampstead, North Carolina. In Miami-Dade County, Florida a Nile crocodile was found at Fruit and Spice Park. In White Trout Lake, a freshwater jellyfish was found. In Little Schultz Creek in Alabama, a convict cichlid was found. A green mussel was found in Perdido Bay. In Lake Sherwood in Louisiana, a Rio Grande cichlid was found. A silver carp was found in St. Mary Parish. A red-bellied pacu was found in Bayou Boeuf. In Houston, Texas, a greenhouse frog was found at the Cockrell Butterfly Center.

Cannister reported on species that were found outside of the Gulf and South Atlantic region. In October, two silver carp were found in the James River in North Dakota. In September, a Chinese mystery snail was collected from Lake George in New York. A butterfly peacock bass was collected from Maryland. Chinese softshell turtles were seen in ponds in Central Park in New York.

For the first time, zebra mussels have moved into the northern section of Chesapeake Bay. A dead zebra mussel was found attached to a dock in the Sassafras River.

Schmitz suggested that USGS email alerts also include where a species is native to.

Aquatic Nuisance Species Task Force Update

D. Britton reported that the next ANSTF meeting will be held on May 2-3, 2012 in Annapolis, Maryland. The decision to approve or reject the 2013-2017 ANSTF Strategic Plan and updated recreational guidelines will be made. Other agenda items will include lionfish and snakehead management and control plans, the Government Accountability audit, National Invasive Species Awareness Week, a national ocean plan, the NEMESIS database system, landscape conservation cooperatives, the spread of invasives through fish passage, and decisions on various panel recommendations.

Britton reported that ANS Task Force-approved management plans will receive funding, and RFPs for the ANS Task Force management plans will be posted on www.grants.gov in the near future as soon as the fisheries budget has been approved by their Director.

Britton informed the panel that USFWS has some funding available relating to state management plans, and even if their state does not have a problem with zebra or quagga mussels, verbiage in their state management plan does not have to include zebra and quagga mussel issues in order to qualify for the funding. However, funding must be requested in the RFP.

Britton reported that they are leading an inspection and decontamination effort in the Lower Colorado River and have received one million dollars to be used towards the effort. The focus is on the Lake Mead National Recreation Area, where there has been a large effort to stop the movement of trailered boats coming out of Lake Mead that are contaminated with quagga mussels from moving into other states. Boats moored at Lake Mead are now required to decontaminate before they leave. More information about the effort can be obtained by contacting **Britton** directly.

Britton gave an update on the Federal budget for the Aquatic Invasive Species Program within the Fish and Wildlife Service. Budgeting for FY 2012 was cut, but 2.9 million dollars was received specifically for Asian carp monitoring, prevention, and control. For FY 2013, the President's budget does not include any funding for state management plans. Over $500,000 was cut from Control and Management for zebra/quagga mussels, snakehead, Chinese mitten crab, apple snails, and lionfish. The remaining funding for Control and Management will focus primarily on preventing Asian carp in the Mississippi River from entering the Great Lakes.

Discussion of the 2010-2014 GSARP Strategic Plan

Ballard briefly discussed the strategic plan and explained that there are several actions laid out for each individual work group to address over the course of the 5-year plan.

Teem pointed out that a "watch list" of species still has not been created, and suggested that the current "species of concern" list be utilized and placed on the website. **Hartman** agreed and announced that before it is put on the website, **Teem** will email the list to **Ballard**, who will forward the list to the panel members for suggestions, changes, and updates to the list. The timeframe for completion is two months. The "watch list" will be officially named and put on the website by the next GSARP meeting.

Hartman asked **Hollin** to inquire if Sea Grant has a Spanish translator who could assist the panel with translating outreach materials into Spanish for distribution to Spanish-speaking Americans and to Mexico.

Invasive Species Advisory Committee Update

E. Chilton briefed the panel on the recommendations previously made by the ISAC Control and Management Subcommittee to NISC (National Invasive Species Council). The first recommendation asked that NISC agencies working on biological control of invasive organisms plan, conduct, and evaluate their programs at the inception of the program in the context of an Integrated Pest Management (IPM) approach. It would require integrating biological control with other management options to achieve maximum effectiveness. NISC presented the recommendation to the agencies and were told that they are still gathering information from other agencies.

The second recommendation asked that NISC departments and agencies that oversee and conduct control operations utilizing biological control agents become more fully engaged in adaptive management by collecting and sharing post-release monitoring data. The IPM approach should emphasize partnerships with local controlling authorities, post-release monitoring, and collaborative programs with other stakeholders in other pest management disciplines. NISC responded that it was a good idea that all agencies agree with, but there is an issue with resources and how the data is shared.

The third recommendation asked that NISC support the www.invasivespecies.gov website as the primary website, coordinating critical and unique information on national invasive species and serving to provide a linkage for accessing all federal invasive species programs. There was a rumor that the NISC website was going to be taken off the internet, but the leadership at the

Department of the Interior supported keeping the NISC website separate, and it has remained on the internet with the goal being to improve the NISC website.

The fourth recommendation from ISAC asked that, in accordance with the National Environmental Policy Act (NEPA), NISC departments, agencies, and their contractors assess the risks of invasiveness whenever their activities lead to the introduction of non-native species or their sub-sets (moving organisms) from where they occur to where they have never historically occurred. The response from NISC was that the Executive Order requires agencies to address invasive species, and the issue is how the EO is being implemented from agency to agency. The focus needs to be on the models for agencies to follow.

The fifth recommendation asked that NISC adopt the ISAC white paper entitled "Marine Bio Invasions and Climate Change" and the recommendations therein. NISC responded that the National Oceans Council has been developing ocean action plans and looking at concepts in the white paper.

Chilton noted that the Department of Transportation is looking at various ways to eliminate potential invasive insects via aircraft that come from overseas. Air curtains are being considered as one method of preventing insects from gaining entry into aircraft, and preliminary tests have shown that they are effective.

Chilton highlighted four new recommendations that were made at the last ISAC meeting. The first recommendation was from the ISAC Early Detection and Rapid Response Subcommittee and asks that NISC support and encourage the National Research Council of the National Academy of Sciences' review of frameworks for validation of advanced molecular assays for aquatic invasive species detection technologies and their protocols. The recommendation passed.

The second recommendation was from the Research Subcommittee. Expanding trade across the Pacific poses a dual challenge to the control of invasive species. There is a high potential for introductions of new species in both directions, and a high potential that some introduced species will become invasive because of similarities of climates and ecology of Central and Eastern Asia and North America. In light of these challenges and the potential negative impacts of such introductions on the economies and environment of the U.S. and its trading partners in Eastern Asia, ISAC recommends that the Department of State seek the cooperation of appropriate agencies in convening a multi-lateral meeting of scientists and governmental representatives from APEC (Asia-Pacific Economic Cooperation) to develop measures to prevent the introduction of invasive species in the course of trans-pacific commerce. A decision by NISC is expected by the next meeting

The third recommendation from ISAC asked that the USACE immediately reinstate funding for the Aquatic Plant Control Research Program due to its national importance in the control and management of aquatic invasive plants. The recommendation passed.

The fourth recommendation from ISAC asked for full funding in FY 2012 for ARS research programs in biological control and other invasive species programs and projects, including systematics. The recommendation failed.

Work Group Updates

Hartman reported that she contacted all of the current work group chairmen and found that since the last GSARP meeting, there has been no definitive action on any work group. **Kumpf** pointed out that the Education/Outreach Work Group produced the "Traveling Trunk".

Hartman announced that she has made changes to the Early Detection/Rapid Response Plan for the region. She will submit the plan to the panel members for review at the next GSARP meeting.

Hartman pointed out that there are seven new panel members who are not assigned to any work groups. She also stated that work group membership is not restricted to panel members only. **McMahon** and **Bonvechio** will serve on the Eradication/Control/Restoration work group. **McMahon** will also serve on the Early Detection/Rapid Response work group. **Schmitz** will serve as the Chairman of the Information Management work group. **Kingsley-Smith** will serve on the Research/Development work group. Cannister will serve on the Information Management work group. **Hartman** asked that each work group chairman contact the members of their group.

Discussion of ANSTF Recommendations

Ballard asked the panel members if they had any recommendations to present to the Task Force at their May 2012 meeting. **Ballard** suggested recommending that funding be made available to support the state plans for FY 2013. He asked for input as to what projects would be impacted if funding was no longer available. Georgia's flathead study would be impacted. **Chilton** stated that zebra mussel, snakehead, and Asian carp projects would be impacted.

Schmitz recommended that a survey mechanism be developed that can be utilized by each state to submit what their annual expenditures are for aquatic invasive species issues. This information would be beneficial when requesting funding in the future.

Schmitz made a motion to make a recommendation to the Task Force that a standardized survey mechanism be developed that can be utilized by each state to submit their annual expenditures on aquatic invasive species issues. Bonvechio seconded and suggested that a feature to input whether the expenditure is from state or federal funding be added. Ballard asked the state representatives if they were prepared to begin collecting the data if the Task Force were to accept the recommendation and wanted to test the survey. Hartman called for a vote from the panel members. The motion was approved.

Ballard asked the panel if they also wanted to make a recommendation to the Task Force that they do everything in their power to secure state funding for FY 2013.

Kumpf made a motion to make a recommendation to the Task Force that they do everything in their power to secure state funding for FY 2013. Bonvechio seconded. Hartman called for a vote from the panel members. The motion was approved.

Other Business

Ballard noted that there is an open seat on the environmental user group and asked the panel members what process they wanted to use to fill the seat.

Schmitz suggested that a representative from the Center for Invasive Species and Ecosystem Health at the University of Georgia be considered. **Ballard** asked **Schmitz** to locate a person at the Center for Invasive Species and Ecosystem Health at the University of Georgia who would be interested in serving on the environmental user group and email him their information. **Ballard** will then email the information to the panel members.

Ballard stated that he will email a candidate request for the open seat to the panel members and a vote will be made on which candidate to elect for the seat.

Next Meeting Time and Place

Ballard noted that he has been in discussion with the Mississippi River Basin Panel and they have expressed an interest in meeting jointly with GSARP. There was no opposition from the panel members, and **Hartman** proposed that the next GSARP meeting be set up as a joint meeting with the Mississippi River Basin Panel. **Ballard** will work out the details with the Mississippi River Basin Panel.

It was decided that Louisiana would be the location of the next meeting.

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

Public Comment

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

A motion was made to adjourn the meeting, and the motion was approved. There being no further business, the meeting adjourned at 4:00 p.m.