Session 1: Native plants

10:30-11:20 **Alex Dew**: There's no substitute for native plants
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Negative impacts from non-native plants are often thought to be limited to the physical disturbances from their overgrowth. This presentation highlights examples of the unique and very specialized interactions that native plants have with the ecosystem, showcasing the fact that even a "well-behaved" exotic plant cannot support or deliver a fraction of the biodiversity that a native plant does. The presentation will explore interactions from native plants and insects, predators, hyper-predators, parasitoids, fungi, and other plants. Each interaction represents just a fragment of a food chain, all being 100 percent reliant on the presence of a specific plant species.

11:20-11:45 **Hyun Jung ("J.") Cho**: The euryhaline *Ruppia maritima* connecting freshwater and estuarine water ways
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Abstract: *Ruppia maritima* L. (wigeongrass), one of the seven seagrass species in Florida, also grows in low salinity inland ponds, mosquito-control impoundments, and coastal stormwater systems. It tolerates salinities from near-freshwater to hypersaline conditions. Fast growth and prolific seed production allow *Ruppia* to persist in ephemeral waters. *Ruppia* depends heavily on sexual reproduction, producing durable seeds capable of surviving desiccation and gut passage by waterfowl and fish, facilitating long-distance dispersal. These traits make *Ruppia* well-suited for succession and restoration in brackish transition zones. We evaluated seed-based propagation methods to support restoration in areas connecting freshwater and estuarine waters. Mature seeds collected from established beds across habitat types were tested for viability and germination to establish a baseline. Different storage/stratification treatments applied at varying durations to mimic natural dormancy-breaking processes and to stimulate germination. Results inform improvements to *Ruppia* cultivation protocols and provide guidance for flexible restoration schedules and long-term seed banking. In parallel, we developed and implemented drone-based techniques for seed and seedling deployment into remote or restricted-access sites, including impounded marshes.

Session 2: Hydrilla and Cuban bulrush

1:05-1:30 **Eli Russell:** Evaluating concentration exposure times of different herbicide combinations for hydrilla control
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Other Authors: Jonathan Glueckert, Corrina Vuillequez, Amber Riner, Benjamin P. Sperry

Hydrilla (*Hydrilla verticillata*) is an invasive submersed aquatic plant. Each year, millions are spent to control this plant in rivers and lakes across the US. Its rapid and excessive growth obstructs navigation, disrupts recreational activities, and displaces native plant species. Since hydrilla is a submersed plant, treatment can be difficult because the whole water column has to be treated. In addition to this, the herbicide must be in contact with the plant for a sufficient period to control it. Hitting this required exposure time can be especially difficult in systems that have flowing water. Because of this, it is essential to know how long hydrilla needs to be exposed to a specific herbicide concentration to achieve the desired efficacy. So, an experiment was conducted to evaluate three herbicides at different rates and exposure times for hydrilla control. Diquat, flumioxazin, and florpyrauxifen-benzyl were evaluated alone and in combination at a low and high rate, and several exposure times ranging from 3 hours to 24 hours. Plants were evaluated for 8 weeks after treatment with visual ratings and the collection of above-ground biomass at the end of the study. The results indicated that treatments containing diquat and florpyrauxifen-benzyl and longer exposure times resulted in the best control of hydrilla. These results underscore the importance of maximizing the exposure time for improved efficacy and that utilizing herbicide combinations could help reduce the necessary exposure times for achieving adequate control.

1:30-1:55 **Kelli Gladding**: Hydrilla management rotation of herbicides to prevent resistance in Florida lakes
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In the early 2000's, hydrilla populations in Florida developed resistance to fluridone and in 2011 resistant strains to endothall were identified in Central Florida. Since the early 2000s, several new herbicide active ingredients were registered for aquatics use; however, several of these new chemistries have not been widely adopted and little operational use information exists. Consequently, whole-lake treatments of bispyribac-sodium and topramezone across central Florida lakes were recently monitored to document herbicide dissipation, hydrilla control and, native plant response. The results of these monitoring efforts will be presented.

1:55-2:20 **Patrick Belk**: From stakeholder surveys to tank trials: Managing Cuban bulrush across the southeastern United States
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Cuban bulrush (*Cyperus blepharoleptos*) is an epiphytic aquatic sedge with two distinct biotypes that have invaded the Southeastern United States and risen to a high management priority in the last decade. A survey was conducted of 132 aquatic management stakeholders from across the Southeast to collect, compile, and evaluate current management practices and information about Cuban bulrush biology and ecology. One goal of the survey was to parse out any differences between the two biotypes, but more than half (55%) of the survey respondents were unaware of which type was present in their region. The survey was followed by mesocosm studies of two of the most used herbicides (diquat and 2,4-D) for Cuban bulrush treatment. Ramets from both biotypes were propagated on floating rafts in 20-gal mesocosms from a standardized weight of cuttings in the spring of 2025. After 60 days of growth, plants were treated using a handheld, single-nozzle sprayer. Post-treatment injury ratings were significantly different between treatments from two weeks onward, with 2,4-D alone underperforming both treatments with diquat. At six weeks post-treatment, injury declined for all units treated with 2,4-D alone as new growth emerged. Most notably, biotype had a significant effect on herbicide injury, particularly for 2,4-D. The polycephalous biotype showed significantly less injury from 2,4-D alone as compared to the monocephalous biotype. These results call into question the efficacy of 2,4-D as a viable treatment option for Cuban bulrush and suggest metabolic differences between the two biotypes, which will require further investigation.

2:20-2:45 **Amber Riner**: Demonstration of novel small plot treatments for controlling hydrilla on Lake Seminole

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Lake Seminole, a 37,500-acre reservoir spanning Florida, Georgia, and Alabama, was created in 1958 after the construction of the Jim Woodruff Dam, where the Flint, Chattahoochee, and Apalachicola rivers converge. Similar to many other lakes across the southeastern United States, Lake Seminole is infested with *Hydrilla verticillata*, an aggressively growing submerged aquatic invasive plant from Asia. Hydrilla has caused serious water resource issues on the lake such as impeding navigation, water quality degradation, outcompeting native wildlife, and obstructing hydropower production. Currently in the southeast there is minimal rotation of hydrilla treatments, and management goals do not match concentration exposure times and selectivity profiles of single active ingredients. Therefore, the aim of this study was to evaluate herbicide novel herbicide combinations for hydrilla control in small plots to extend hydrilla suppression. Four treatment sites along the Florida and Georgia border of Lake Seminole ranging from 8 to 64 acres were treated with either endothall (2ppm) and florpyrauxifen benxyl SC (2 PDU), endothall (2ppm) and penoxsulam (25ppb), florpyrauxifen-benzyl SC (2 PDU) and imazamox (200 ppb), and 3 bump treatments spaced 1 month apart of florpyrauxifen-benzyl (2 PDU) in the spring. Point intercept aquatic plant surveys were conducted for nine

months after treatment (MAT). Sites treated with combinations of endothall and florpyrauxifen-benzyl or endothall and penoxsulam exhibited an initial reduction of hydrilla followed by an increase beyond pre-treatment levels 4 MAT. The sites treated with the florpyrauxifen-benzyl and imazamox combination or florpyrauxifen-benzyl bump treatment exhibited decreasing hydrilla abundance until the end of the study. Additional monitoring will occur in the Spring to document potential regrowth.

Session 3: Safety around critters and herbicides

3:20-3:45 **Sam Sardes**: Evolution of endothall
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Endothall is one of the oldest still actively used aquatic herbicides. This presentation will cover the discovery and history of Endothall, its evolution in use patterns, and new discoveries that have been made over the last sixty years since it was added as a tool in the aquatic resource manager's toolbox. Novel use patterns and formulations are being developed every year. This presentation will review all of this with summaries from researchers and peer reviewed studies along some historical notes from professor emeritus faculty from universities spanning the United States.

3:45:4:35 **Mandy D'Andrea**: Identification of native, invasive & endangered wildlife of South Florida
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South Florida is home to many species of flora and fauna. Being able to identify wildlife species is important because native and endangered species should be protected, while invasive species may need to be managed to preserve ecosystem function. This presentation will give attendees the skills needed to identify wildlife in South Florida and to understand why this is important while applying herbicides across the landscape and on Tribal Lands.

4:35-5:00 **Carlton Layne:** Herbicide label interpretation
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This presentation will provide a review of the history and evolution of pesticide regulation, dispel pesticide myths, briefly describe the federal pesticide registration process and the dynamics of label development. Interpreting pesticide labels will cover mandatory v. advisory labeling, the review of actual federally registered aquatic control pesticide labels in an open discussion and Q&A format. The consequences of misuse and the liabilities of noncompliance will also be explained.

Poster Session

Brett Hicks: Precision Herbicide Testing: Evaluating In-Water Treatments in a Controlled Greenhouse Environment
APPLICATOR POSTER
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The Pasco County Mosquito Control District Aquatics Department focuses on managing invasive aquatic weeds that contribute to mosquito habitat. This poster highlights our use of a small-scale greenhouse testing system to evaluate herbicide effectiveness before applying treatments in the field.

Our greenhouse, a repurposed chicken coop, contains three 100-gallon tanks. We measure precise microliter-scale herbicide doses and apply treatments to a defined 6 square foot area. This setup allows us to test both individual herbicides and herbicide mixtures on key invasive species, including water hyacinth (*Eichhornia crassipes*), water lettuce (*Pistia stratiotes*), and Cuban bulrush (*Cyperus blepharoleptos*).

The poster presents results from trials with single herbicides and mixtures, as well as treatment plans we developed for specific target combinations. Our testing has provided valuable insight into herbicide performance, allowed us to refine field treatments, and reduced waste through precise dosing. We also discuss plans for future testing on additional herbicides of mixed plant communities.

Abigail W. Schulken: Evaluating Efficacy of Flumioxazin and Topramezone Combinations for Water Lettuce Control
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Other Author: Dr. Eli C. Russell

Water lettuce (*Pistia stratiotes*) is a widely distributed aquatic floating plant that spreads rapidly through budding and stolon growth, taking over the water surfaces and impacting waterbody use. Flumioxazin is commonly used for chemical control because of its rapid burndown and overall efficacy against water lettuce. However, due to its increased sensitivity, applicators have tried to reduce rates of flumioxazin applied, which has led to shorter control periods or control failure. Reducing the rate puts a higher selective pressure on water lettuce and could result in herbicide resistance development. A pathway to delaying this progression to resistance is to utilize multiple effective modes of action. This experiment evaluated the efficacy of flumioxazin and topramezone for water lettuce. Mature water lettuce plants were treated with the labeled rate of flumioxazin, a low rate of flumioxazin, and several combinations of flumioxazin and topramezone. Four weeks after treatment (4 WAT) visual ratings indicated a significant difference in the level of control

between treatments. All flumioxazin and topramezone combination treatments resulted in >87% control at 4 WAT. Generally, the combinations provided similar control of water lettuce to the labeled rate of flumioxazin. The combinations also provide an avenue to improve efficacy while reducing the chance of flumioxazin resistance development in water lettuce.

Amber Riner: Effect of Chilling Duration on Sprouting of Clade C Hydrilla Turions
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Hydrilla (*Hydrilla verticillata*) is a highly invasive, submersed aquatic plant, with the dioecious biotype primarily found in the southern United States and monoecious biotype more common in the north. In 2016, a genetically distinct hydrilla population, referred to as Clade C, was reported in Harford County, Connecticut. A chilling period is required to induce the sprouting of tubers and turions for monecious hydrilla but not diecious. This study aimed to determine whether a chilling period is necessary to break dormancy and stimulate sprouting in Clade C hydrilla turions. This study followed a completely randomized design with four replications per treatment and three sub-replicates per replication. It was conducted in two separate runs: one in Gainesville, Florida, and the other in New Haven, Connecticut. Clade C hydrilla turions were subjected to different chilling durations (0, 2, 4, 8, and 16 days) before being transferred to a 30°C growth chamber with a 14:10 photo period. Sprouting, which was defined as ≥25% elongation or root development, was assessed over a 16-day period using ImageJ. Results showed no significant differences in percent turions sprouted across treatments until day 4, but by the end of the study, turions chilled for 8 or more days exhibited significantly higher sprouting (>97%) compared to the unchilled control (73%). Additionally, time to 50% sprouting was reduced in chilled turions (2.6–3.7 days) compared to unchilled turions (6.9–10.9 days). These findings indicate that chilling breaks dormancy and accelerates sprouting in Clade C hydrilla, suggesting a potential for increased infestations following cold periods. However, since a large portion of unchilled turions were able to sprout without a chilling period, Clade C may also pose a threat to areas further south, beyond the typical range of monoecious hydrilla.