35th Annual Meeting of
The Florida Association of Aquatic Biologists
October 6-7, 2021
Cedar Key, Florida

Tentative Agenda

Wednesday, October 6, 2021

09:00- 11:00	FAB Executive Committee Meeting
11:00-13:00	Lunch
13:00-13:15	Welcome and Announcements- Shannon McMorrow
13:15-13:40	Monitoring the Gastropod Community in Volusia Blue Spring, Rob Mattson
13:40-14:05	It's Not All About Males: Association and Taxonomy of Larvae and Females of Nearctic *Polycentropus* Curtis 1835 (Trichoptera: Polycentropodidae), Alex Orfinger (Student)
14:05-14:30	Breathing Life into a Spring: Evaluating Restoration Activities to Better Prioritize Restoration Activities in Florida's Springs, Greg Owen (Student)
14:30- 14:45	Break
14:45-15:05	Biological assessments in Suwannee River Water Management District MFL Priority Springs – I: Qualitative observations regarding macroinvertebrate communities, Doug Strom
15:05- 15:30	Differentiating between *Hyalella wakulla* (Drumm & Knight-Gray, 2019) and *Hyalella azteca* (Saussure, 1858) from Florida Stream Condition Index (SCI) samples and the influence of this differentiation on SCI scores, Jennifer Davenport
15:30-15:45	Announcements and Presentation of Student Awards
16:00-17:00	Historic Walking Tour with Rob Mattson
17:30	Social at Duncans

Thursday, October 7, 2021

08:30-10:30	Plenary Talk and Tour with Savanna Barry from the UF Biological Station, Cedar Key
10:30-11:00	Break
11:00- 11:25	Orange County Stream Condition Index Monitoring, Mike Drennan
11:25- 11:50	Comparison of macroinvertebrate assemblages collected using multiplate samplers and sweep netting along a water quality gradient, Craig Duxbury
11:50-13:30	Lunch
13:30-14:30	Business Meeting
14:30-15:00	Announcements and Annual Meeting Concludes

Program Session

ABSTRACTS:

Monitoring the Gastropod Community in Volusia Blue Spring

Robert A. Mattson*, CEP, CSEm St. Johns River Water Management District, Palatka, FL; Kirsten Work, PhD, Stetson University, Deland, FL

Volusia Blue Spring is a first magnitude spring (mean annual flow 157 ft^3/second) located in Volusia County west of Orange City on the St. Johns River. In 2006, St. Johns River Water Management District (SJRWMD) adopted a minimum flow regime (MFL) for the spring, based largely on providing an adequate amount of winter warm water refuge habitat for use by Florida manatee. In order to evaluate whether the MFL protected other "Water Resource Values" (as listed in Chapt. 62-40, Fla. Administrative Code), SJRWMD implemented a long-term monitoring effort. One component of this was quantitative monitoring of snail populations in the spring.

Gastropods (snails) are common elements of the benthic communities of Florida freshwaters and are particularly common in Florida springs. Major groups include Physidae, Hydrobiidae, Planorbidae, Viviparidae, and Pleuroceridae. Exotic taxa include Thiaridae and introduced species of apple snails (*Pomacea* spp.). Many springs are known to support one or more endemic species of hydrobiid, based on the work of the late Fred Thompson. Blue Spring supports two endemic species: Blue Spring hydrobe (*Aphaostracon asthenes*) and Pygmy siltsnail (*Floridobia parva*). Other relatively unique snail taxa found in the spring are *Floridobia floridana*, which is endemic to Florida, and the pleurocerid *Elimia vanhyningiana*, which is endemic to the St. Johns River drainage.

Snail populations in Blue Spring were monitored quarterly in 2007-2008, 2014-2015, and 2019-2020. Collections were made in three 100 m reaches (upstream near the headspring, mid-way down the spring run, and in the lower spring run) in 2007-08 and 2014-15. Only the upper and mid-reaches were sampled in 2019-20 due to difficulty in sampling the lower reach. A total of 27 taxa of snails were collected in the spring over these three sampling events. Hydrobiidae and Planorbidae had the most number of taxa, and hydrobiids generally dominated the overall snail abundance as density (# individuals/m^2). Snail density was very variable and did not differ significantly among sampling events. Generally higher snail abundance was seen at the mid- and lower reaches in 2007-08 and 2014-15 but higher abundance was seen at the upstream reach in 2019-20.

The most abundant species in the spring and run was *F. parva* (at one or more sampling reaches). Other taxa which periodically exhibited high abundance (> 1,000/m^2) were other species of *Floridobia* (*F. floridana* or unidentified spp.), *Tryonia aequicostatus*, and *Pyrgophorus platyrachis*. All of these are hydrobiids. Exotic snails were a lo

w proportion of the total snail abundance (generally < 10%) in all three sampling events, although previous work indicated they can become dense in patches. Exotic snails had highest relative abundance at the upstream sampling reach in all three events.

Snail density exhibited a significant negative correlation with stage in the spring run and fish density. Snail diversity exhibited a significant negative correlation with fish density. Snail density and diversity were not significantly correlated with spring discharge or dissolved oxygen, but higher snail densities were only present at spring flows ~ 130 ft^3/second or greater.

*Presenting Author

It's Not All About Males: Association and Taxonomy of Larvae and Females of Nearctic *Polycentropus* Curtis 1835 (Trichoptera: Polycentropodidae)

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The caddisflies (Trichoptera) are a diverse and ecologically important order of insects comprising over 16,250 nominal species. These holometabolous insects exhibit aquatic immature life stages where they are important components of food webs and aquatic-terrestrial nutrient cycling. The larvae are of particular interest given their reputation as "underwater architects" and their use as sentinels in water quality monitoring programs. Still, alpha taxonomy of the order relies on male genitalic characters, leaving female and immature taxonomy lagging far behind. The Nearctic members of the genus *Polycentropus* (Polycentropodidae) are a prime example, with 12 of 30 females (40%) and 29 of 30 larvae (97%) undescribed. To help remedy this taxonomic impediment, we use an integrative approach combining mtDNA and morphology to associate, describe, and diagnose larvae and females of Nearctic *Polycentropus*. Using >350 barcoding fragments of mitochondrial cytochrome oxidase I (COI) from males of known identities and unknown larvae and females, we have molecularly associated 15 larvae and two additional females. Diagnostically informative characters have been identified, including muscle scar patterning, head color and pigment banding, and anal claw curvature for larvae, and shape, orientation, and sclerotization of internal and external portions of the genitalia for females. Ongoing efforts include generating identification tools including discriminatory matrices or dichotomous keys, where possible. Finally, current issues with the identification of Nearctic larval Polycentropodidae genera are briefly discussed in light of new findings.

Breathing Life into a Spring: Evaluating Restoration Activities to Better Prioritize Restoration Activities in Florida's Springs

Greg Owen*, Matt Cohen
Affiliations: Master's Student at the University of Florida, School of Forest, Fisheries, and Geomatics Sciences, Senior Planner Alachua County Environmental Protection Department

Ecological experiments emerge as crucial tools for establishing this preferential ordering of restoration activities, and for screening out those activities that may have limited value. Understanding the "hierarchy of restoration needs" helps mangers support their decision making process when evaluating restoration activities. In order to examine a hierarchy of restoration needs in Florida's iconic springs we experimentally evaluated competing restoration actions. For over a one year period researchers monitored the response in plant and algal growth in experimental treatments while manipulating the variables of dissolved oxygen, introduction of grazers, introduction of plants, and removal of algae at Hornsby Springs, located in Alachua County Florida. We found dissolved oxygen to be the main driver of submerged aquatic vegetation growth, and that subsequent restoration activities like the introduction of plants and snails would only be successful when the correct initial conditions of dissolved oxygen levels were met. This experiment provides evidence to support the case that restoration activities in Florida's Spring Ecosystems will have the best chance of success when the initial conditions of dissolved oxygen are met.

*Presenting Author

Biological assessments in Suwannee River Water Management District MFL Priority Springs – I: Qualitative observations regarding macroinvertebrate communities

Doug Strom*
Water & Air Research, Inc., Gainesville, Florida

In April 2021, Water & Air Research, Inc. (Water & Air) conducted a short-term synoptic biological sampling survey over a range of springs/spring runs in the Suwannee River Water Management District (SRWMD). This study sampled 18 springs for benthic invertebrates and recorded cover estimates for submerged (and emergent) aquatic vegetation. Other work at all the sites included collection of *in situ* water quality parameters (temperature, dissolved oxygen, pH, specific conductance, and salinity), and incidental observations of plants (including bryophytes and algae), fish, and wildlife within and near the transect areas. Attached benthic and epiphytic algae (periphyton) was measured (or estimated) *in situ* for filament/mat length. The resulting data is meant to afford a comprehensive snapshot of conditions at each spring run. Seven of the 18 springs had dip net (600 µm mesh) collection of 10 approximately 0.25 m by 0.25 m^2 sweeps) samples of benthic macroinvertebrates taken in both "major" and "minor" habitats as defined by Florida Department of Environmental Protection. For these high effort sites, the laboratory processed 500 macroinvertebrate individuals across all sample types for each spring of this type. The other 11 springs received lower effort sampling for benthic macroinvertebrates consisting of three dip net sweeps (approximately 0.25 m by 0.25 m^2, 600 µm mesh) from up to three "productive" habitats (if these were accessible and present). No "minor" habitats were sampled at the low effort sites. One hundred fifty macroinvertebrate organisms sorted from the material collected at low effort sites were processed in the laboratory across all sample types for each spring for this category. This presentation will discuss notable qualitative macroinvertebrate observations made during this study. These will be discussed in relation to specific attributes of the sampled springs. Notable macroinvertebrate observations will be discussed in relation to studies of macroinvertebrates performed previously in the SRWMD.

Differentiating between *Hyalella wakulla* Drumm & Knight-Gray, 2019 and *Hyalella azteca* (Saussure, 1858) from Florida Stream Condition Index (SCI) samples and the influence of this differentiation on SCI scores.

Jennifer S. Davenport* and Julianne Knight-Gray
Wood Environment and Infrastructure Solutions, Inc.

Previous studies have shown that *Hyalella azteca* (Saussure, 1858) is a species complex composed of cryptic species that are difficult to differentiate based on morphology alone. One of these cryptic species was recently described, *Hyalella wakulla* Drumm & Knight-Gray, 2019, from samples collected within the Wakulla and St. Marks Rivers. *Hyalella wakulla* differs from other cryptic species by the setation on maxilla 1 and the telson. Dissecting maxilla 1 is a laborious process for routine Stream Condition Index (SCI) studies, so determining the necessity of this extra effort was evaluated. In samples where both species were present, the SCI scores were calculated for the sample when the two species were kept separate versus when the two species were lumped together under one taxon. These results provide an opportunity for an open discussion regarding the level of identification effort for *Hyalella* in future SCI samples.

*Presenting Author

Orange County Stream Condition Index Monitoring

Mike Drennan*
Affiliations: Orange County Environmental Protection Division

Orange county has had a rich history of monitoring the biological health of its waterbodies within our county dating back to the 1960's. We are currently using the SCI method to bio-asses 11 stream segments within 6 watersheds. The Big Econlockhatchee (3 sites), Little Econlockhatchee (3 sites), Big Wekiva (1 site) and Little Wekiva (1 site) watersheds contribute to the Middle St. Johns river basin. Our remaining watershed's, Shingle Creek (2 sites) and Boggy Creek (1 site), contribute to the Kissimmee River basin. Details of site location and characteristics will be highlighted through maps and photographs and SCI results for select sites.

Comparison of macroinvertebrate assemblages collected using multiplate samplers and sweep netting along a water quality gradient

Craig Duxbury*
Wood Environment and Infrastructure Solutions, Inc.

*Presenting Author

Plenary Talk and Tour - Cedar Key Living Shorelines Projects

Savanna Barry, PH.D*
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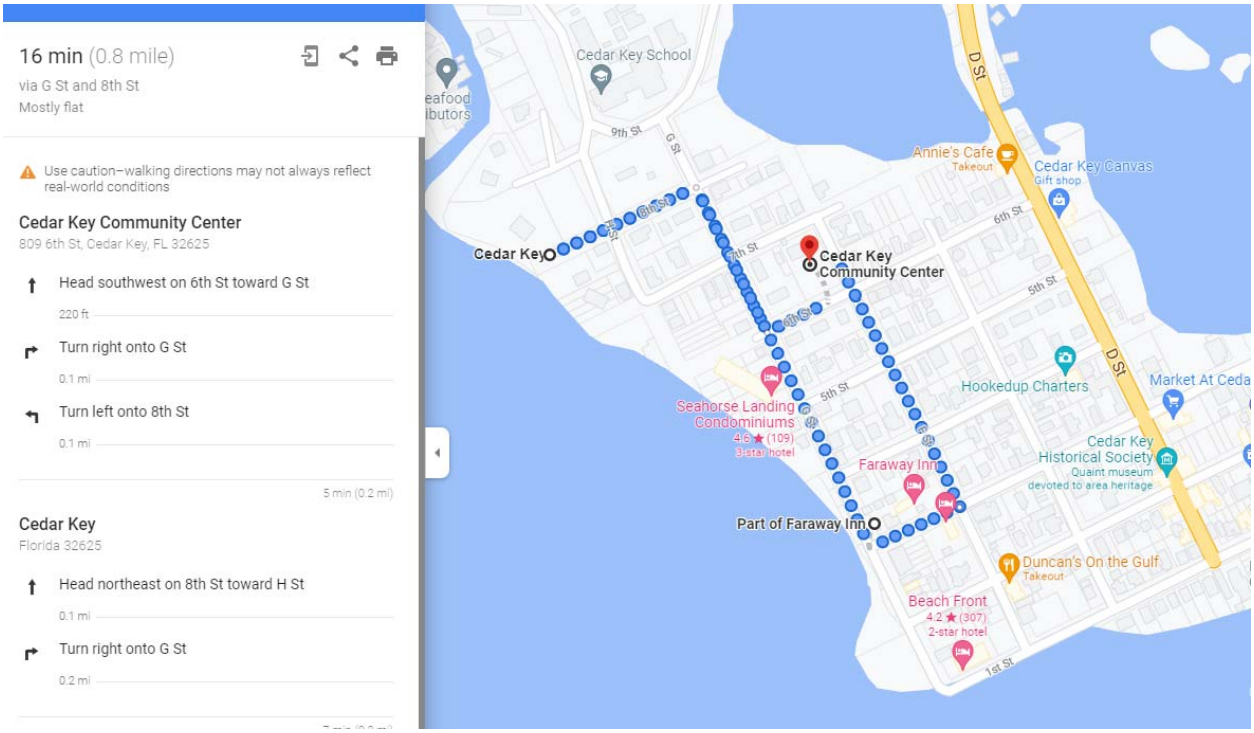

*Presenting Author