SAVe Our River's Grasses *Expedition*

Overview

Prepared By
St. Johns RIVERKEEPER

ST. JOHNS RIVERKEEPER®

2023

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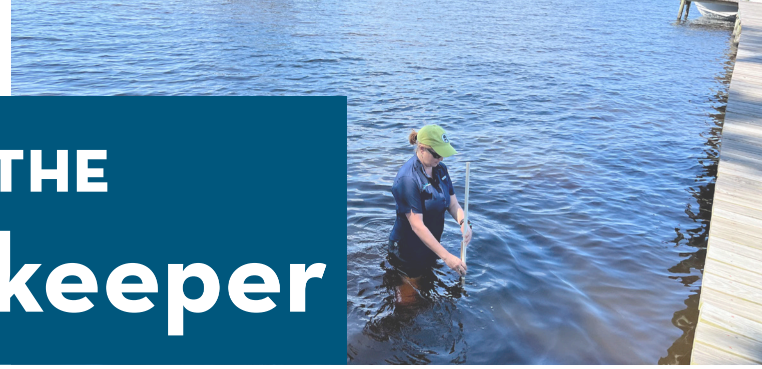
Attachments



Introduction from the St. Johns Riverkeeper

Submerged aquatic vegetation (SAV) is the foundation of our river's health – providing biofiltration, habitat and food for both commercial and recreational aquatic species, erosion protection, oxygenation of the water column, carbon sequestration and storage, and more. Unfortunately, the St. Johns River SAV is suffering mounting threats and stress resulting in the near demise of our river's submerged grasses, much to the alarm of scientists, fishermen, homeowners and river enthusiasts.

In May 2023, St. Johns **RIVERKEEPER** (SJRK) launched its first *SAVe our River's Grasses Expedition* seeking answers and solutions to the disappearing SAV of the St. Johns. Over four days, our team surveyed an 80-mile stretch of the river between Doctors Lake and Lake George searching for remaining grass beds, taking measurements, conducting water quality testing, and seeking solutions to restore this vital habitat. We met with riverfront residents, fishermen, scientists and community leaders to enhance our data collection by the observations of those who have lived on, explored, fished, or studied our river for decades. Our May 2023 Expedition Field Log (Attachment A) is a snapshot of these conversations combined with real time conditions documented from May 16-19. SJRK also returned to several sites in June and July for additional data as noted. SJRK will conduct two more 2023 Expeditions in August and October and will publish each expedition's findings. SJRK will return to the field in March 2024 and is committed to this effort for a total of five years in order to identify solutions to reverse this devastating loss of SAV.

This overview also provides insight from decades of study from the St. Johns River Water Management District (SJRWMD) and the U.S. Army Corps of Engineers (USACE). In an effort to understand how varied stressors in the river could affect SAV abundance and diversity on a temporal scale, the SJRWMD designed and conducted an intensive monitoring program that continues to this day (Attachment E).

In accordance with the State permit, Florida Department of Environmental Protection (FDEP) Environmental Resource Permit No. 0129277-017-BI (2016), for the USACE Jacksonville Harbor deepening project, a Biological Monitoring Plan (BMP) for SAV was required that includes SAV monitoring at and data analysis for seven locations within the Lower St. Johns River (LSJR) to determine if salinity intrusion would present a hindrance to species survival. (USACE, 2022)

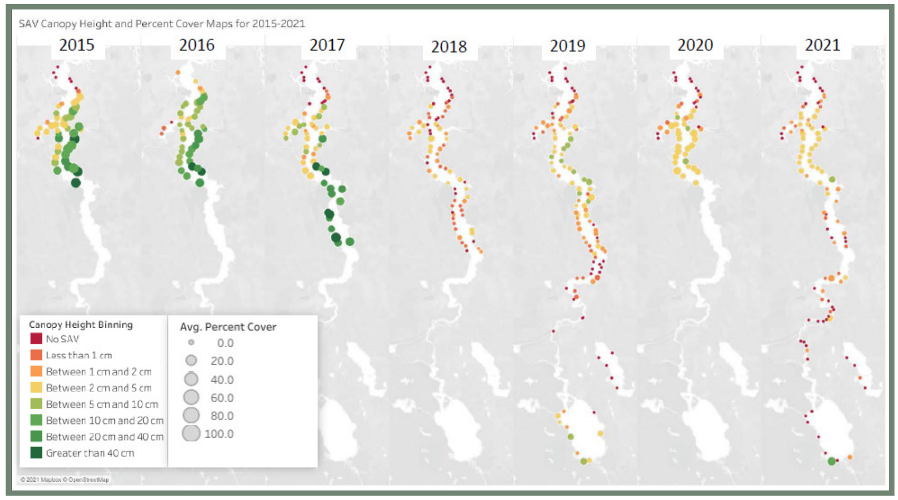
The Florida Fish & Wildlife Conservation Commission (FWC) has been leading a fencing effort since 2020, installing protective mesh barriers around limited test areas in the river in Putnam and Volusia Counties to reduce grazing pressure by hungry turtles, fish, and manatees. These enclosures vary in size and location. FWC has also been working on SAV restoration through transplanting projects in Polk, Putnam, and Volusia Counties.

These state and federal agencies have documented and acknowledged the loss in SAV, but no clear plan exists to restore the river's lost grasses or to protect the St. Johns River Estuary from the growing and expanding stressors of SAV. Over the next five years, SJRK will continue this Expedition to collect field and existing data while working with our river communities and state and federal agencies to do all we can to *SAVe Our River's Grasses*.

Come aboard on this journey to SAVe the St. Johns. Our river depends on us.

Purpose and Significance

The St. Johns River is the longest river in Florida, flowing **310 miles** north from its headwaters at Blue Cypress Lake in Indian River County to its mouth where it empties into the Atlantic Ocean east of Jacksonville. Contrary to what some might think, the fact that our river flows north is *not* very unusual. Water flows in the path of least resistance – there are rivers and tributaries all over the world that flow east, west, north, and south. The St. Johns flows north because its headwaters are a mere **27 feet** higher in elevation than where it ends – dropping approximately one inch per mile over the course of 310 miles. This slow drop in elevation makes it one of the "laziest" rivers in the world. It also makes our river more vulnerable to pollution, harmful algal blooms (HABs), saltwater intrusion and sea level rise. Covering nearly **16% of the land area of the state**, the St. Johns River watershed spans an area of approximately **9,000 square miles** and is home to over **5.5 million people**.



The Lower St. Johns River runs for 100 miles from the river's confluence with the Ocklawaha River and is an extended estuary. Historically, the tidal balance of salt and freshwater of the St. Johns River Estuary has enabled healthy underwater grasses to thrive. SAV provides unparalleled ecosystem services, including habitat and essential nutrition for fresh and saltwater species. Fish and insects forage and avoid predation within the cover of the grass beds (Batzer and Wissinger 1996; Jordan, Bartolini et al. 1996). Commercial and recreational fisheries, including largemouth bass, catfish, blue crabs and shrimp, are sustained by healthy SAV habitat (Watkins 1992). Jordan 2000 asserts that SAV beds in the Lower St. Johns River Basin have three times greater fish abundance and 15 times greater invertebrate abundance than do adjacent sand flats. Seagrass beds are excellent providers of carbon sequestration and storage, for two main reasons: 1) their plants usually grow a lot each year, and in the process, capture (or sequester) large amounts of carbon dioxide (CO2); and 2) their soils are largely anaerobic (without oxygen) so carbon that gets incorporated into the soils decomposes very slowly and can persist for hundreds or even thousands of years (NOAA, 2022). SAV and marsh beds also "significantly reduce wave energy and current velocity, and dissipate storm tidal energy and wave and wind energy, thereby reducing flood and wind damage to structures and roadways from hurricanes and nor'easters" (Hackney, 2015).

This once thriving St. Johns River Estuary is now at risk. The river's SAV is disappearing, the wetlands are stressed, and fish habitat (both SAV and salt marsh) is vanishing from the St. Johns River ecosystems.

The documented stressors to SAV (Sagan, 2007; Goldberg, et al., 2018; & Pinto, et al., 2022) are multifaceted and include:

1. **Lack of light penetration** (a/k/a increased light attenuation)
2. **Increased salinity**
3. **Water quality degradation**
4. **Extreme climatic events**
5. **Grazing pressure**

These compounded stressors have decimated SAV in most of Duval, Northern Clay, and St. Johns Counties, in the northern section of the St. Johns River Estuary (SJRWMD, 2023c - Attachment D).

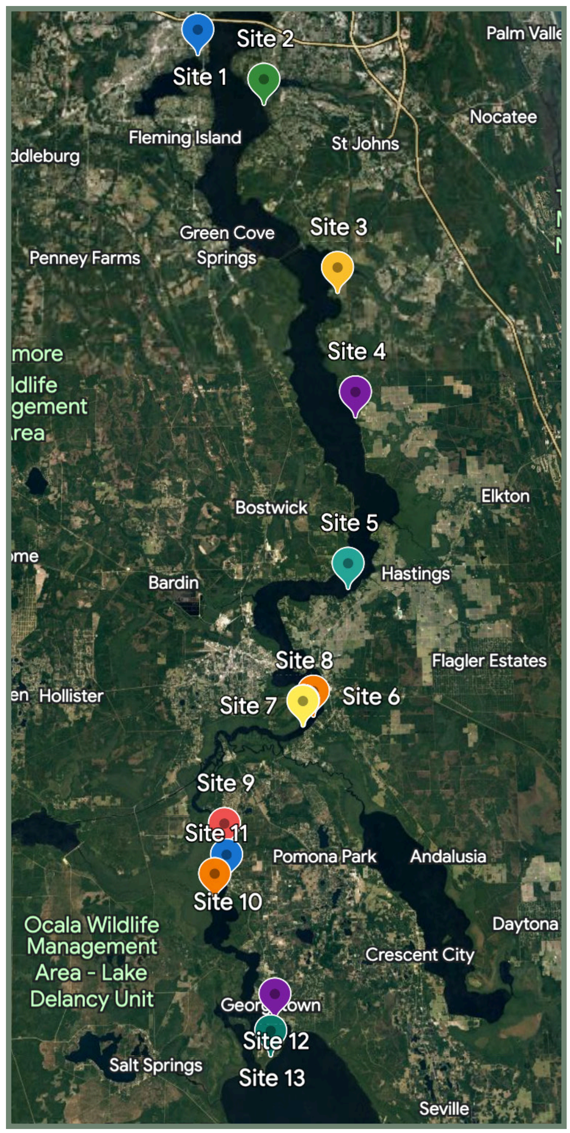
Following Hurricane Irma in 2017, scientists concluded that the vast majority of SAV has disappeared in the Lower St. Johns River including within Putnam County, with estimates as high as 99% (Virnstein, 2022). The dominant species (in both distribution and abundance) within the Lower St. Johns River is *Vallisneria americana*, a/k/a Eelgrass or Tapegrass. Other less common SAV include Water naiad (*Najas guadalupensis*), Widgeon grass (*Ruppia maritima*), Muskgrass (*chara sp.*), Spikerush (*Eleocharis sp.*), Water thyme (*Hydrilla verticillata*), Baby's tears (*Micranthemum sp.*), Sago pondweed (*Potamogeton pectinatus*), Small pondweed (*Potamogeton pusillus*), Awl-leaf arrowhead (*Sagittaria subulata*), and Horned pondweed (*Zannichellia palustris*) (Attachment F, Pinto, et al., 2022). Figure 1.1 above depicts the loss of SAV canopy height and percent cover in the St. Johns River from 2015-2021, as monitored by the SJRWMD. **SAV does periodically decline as a result of droughts or hurricanes, but the grasses typically begin to grow back within a few years. However, SAV diversity and abundance in the St. Johns have not bounced back since Hurricane Irma due to compounding stressors.**

Government environmental agencies have offered several possible reasons, but consensus has not been reached and more needs to be done. **It is therefore the goal of these expeditions to document the health and distribution of SAV in the St. Johns River in a way that captures seasonal patterns and changes at various sites.**

Expedition Team & Study Area

On May 16, 2023, SJRK launched its first multi-day expedition to investigate the case of the lost grasses. The SJRK team spent four days on the water monitoring 13 sites across an 80-mile stretch of the most threatened habitat of the St. Johns River. The team will patrol this area routinely during the SAV annual growing season from March to October for the next 5 years. The team currently includes Lisa Rinaman, St. Johns Riverkeeper; Soraya Aidinejad, SJRK Advocacy Specialist; Jessica Finch, SJRK Putnam County Advocate; Zoë Tressel, SJRK Intern and JU PPI & MSRI Masters Student; and Captain Steve Cobb. Expert advisors included Dr. Gerry Pinto and Dr. Robert Virnstein.

In order to best detect changes, the most sensitive monitoring methods involve sampling the exact same places repeatedly. Each location is different (sometimes within as little as a few feet), so to accurately detect change between time periods, it is necessary to ensure that the difference between sample times is not due to different locations. To ensure accuracy, the SJRK Team denoted each site's exact GPS location and compass bearing for future sampling (Attachment B).



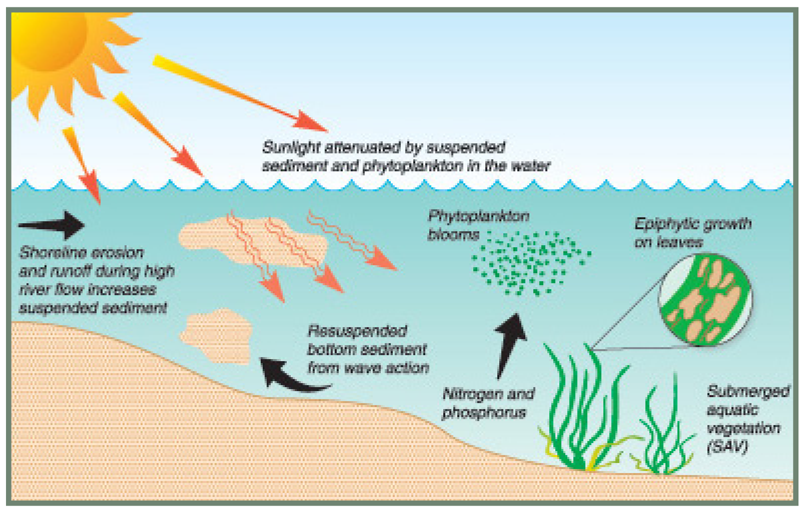
SAV Stressors

State and federal agencies have identified a variety of stressors that affect SAV. They are often linked together, and thus separating each into individualized causation factors is difficult. Additionally, stressors affect the St. Johns' grasses differently, depending on location, species, and whether these stressors are compounded upon one another. In general, documented stressors fall into the following categories:

- **Increased light attenuation** due to algal blooms, higher water levels, high color content, turbidity, and irresponsible development
- **Increased salinity** due to dredging, over-pumping of our aquifer, structural flow interference, sea level rise, and drought
- **Water quality degradation** due to nutrient pollution and sedimentation
- **Extreme climatic events** including hurricanes, flooding and drought
- **Grazing pressure or disruptive behaviors** by hungry turtles, blue crabs, manatees and invasive species like tilapia

Light Attenuation

Light attenuation in the water column (a function of water clarity) has been identified as a major factor limiting the depth at which SAV can thrive (Midwood, et al., 2021). As light attenuation increases, light intensity decreases and SAV is unable to photosynthesize as efficiently. Light attenuation is increased by factors like high color, algal blooms, and suspended solids. High color can be caused by changes in flow (due to powerful storms & precipitation events), accumulation of sediment, and algae particulates. While the light-attenuating color of the Lower St. Johns River is mostly of natural origin, the two other factors that increase light attenuation, chlorophyll-a and total suspended solids, are often anthropogenic (Sagan, 2007).



Irresponsible development practices can also lead to increased light attenuation in the water column. Coastlines developed with residential units are associated with nutrient enrichment in the adjacent waterways and phytoplankton blooms, which contribute to low-light conditions (Goldberg, et al., 2018). The figure above depicts a conceptual diagram of factors affecting water clarity as they relate to light attenuation. Impacts of nutrients, sediments, algal blooms, and epiphytic growth on SAV can affect the amount of sunlight reaching the plants (USGS, 2018).

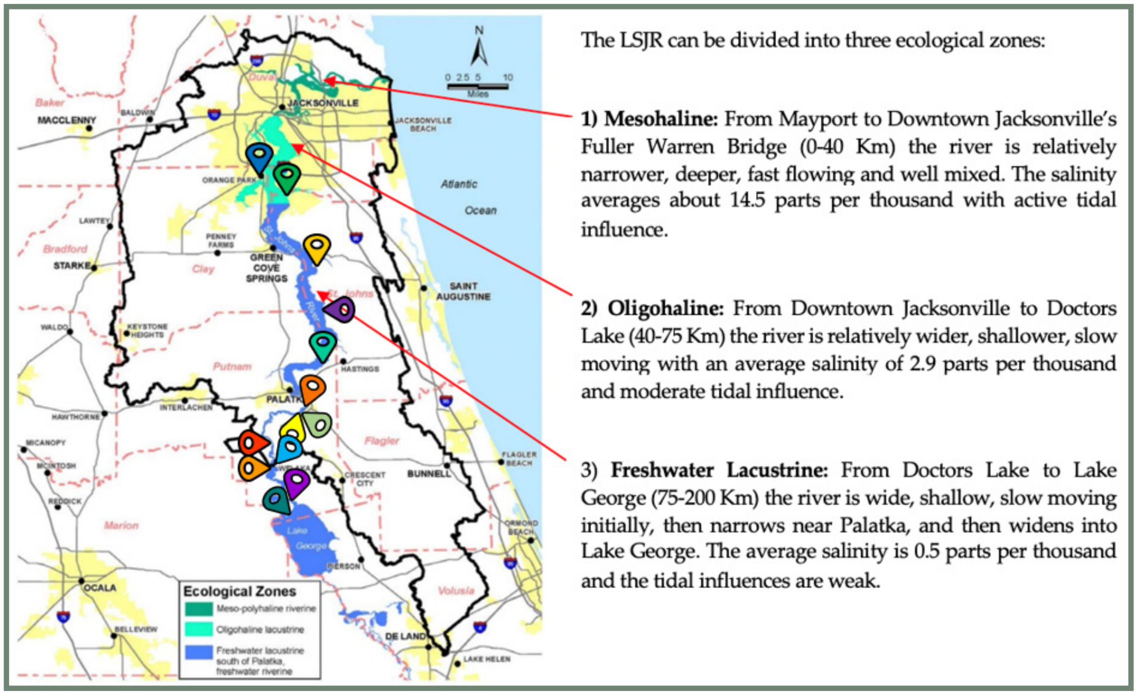
Salinity

SAV found in the Lower St. Johns River Basin is primarily freshwater and brackish water species (Pinto, et al., 2022), meaning that they are highly sensitive to salinity stress. The Summary of Submerged Aquatic Vegetation (SAV) Status Within the Lower St. Johns River 1996-2007 prepared by Jennifer Sagan documents the effects salinity has on SAV during drought periods occurring from 1999-2001 and 2006-2008. During these periods, some areas in the lower (Duval, and northern parts of Clay & St. Johns Counties) reaches of the river were completely stripped of SAV presence due to higher-than-normal salinity concentrations.

Increased saltwater intrusion is accelerating due to sea level rise, deepening of the St. Johns River at the mouth, and overuse of our aquifer that is reducing freshwater spring flow. According to the 2022 Lower St. Johns River Report, the St. Johns River can be split into three Ecological Zones based on salinity (Pinto, et al., 2022).

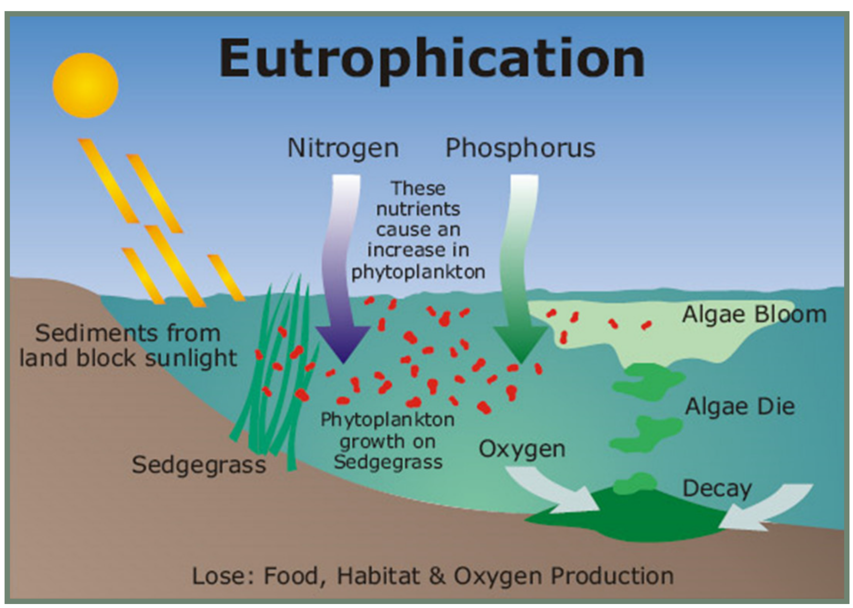
- Ecozone 1 - Mesohaline (closest to the Atlantic Ocean)
- Ecozone 2 - Oligohaline
- Ecozone 3 - Freshwater Lacustrine as one moves upstream (southward)

The graphic to the right depicts these zones and their ranges throughout the St. Johns River, overlaid with Expedition Sites 1-13 (North to South). Due to their salinity intolerance, SAV can only fully establish itself in Ecozones 2 and 3. This is more true now than in years past with more recent and frequent salinity intrusion. Sites 1 and 2 were located in Ecozone 2, while Sites 3-13 were located in Ecozone 3. SJRK's salinity readings at Sites 1 and 2 (Ecozone 2) averaged 5.72 ppt, which is higher than expected based on average salinity. Sites 3-13 (Ecozone 3) averaged 0.62 ppt, which is in line with expected salinity readings for that Ecozone.



Water Quality: Harmful Algal Blooms & Nutrient Pollution

A harmful algal bloom (HAB) occurs when algal density rapidly increases in an aquatic system; this is often caused by excess nutrients, commonly referred to as eutrophication. The graphic to the right (IRL, 2020) portrays the eutrophication process and its effects on the water column. With millions of cells per liter, HABs deplete available oxygen in the water column, block available sunlight penetration, and can be highly toxic. While they can occur naturally, nutrient pollution increases their frequency, duration and intensity. Increased dissolved nutrients can also increase both populations and density of light-blocking epiphytes (Stallings, et al., 2015).



Epiphytes are any non-parasitic plant that grows upon another plant for physical support. Overall, SAV productivity can be greatly hindered by competition with phytoplankton for light and epiphytic growth on shoot and blade surfaces (Goldberg, et al., 2018; Boustany et al. 2010). Nutrient pollution is caused by various factors; these include sewage sludge (biosolids) seepage from agriculture applications, fertilizer run-off, wastewater discharge, and septic tank or lift station leaks.

Extreme Climatic Events

"Tropical storms and hurricanes not only increase light attenuation by increasing color and suspended solids in the system, they can also remove SAV through physical scouring of the littoral zone" (Sagan, 2007). In 2017 Hurricane Irma wiped out SAV from Lake George north through Putnam County to Southern Clay and St. Johns Counties. The typical flow rate of the St. Johns River is between 2-11 billion gallons/day, depending on drought and flood conditions. During Irma, the flow rate hit 88 billion gallons/day; this rate may not even represent the maximum, however, as the gauge on the Acosta Bridge was rendered inoperable after this measurement. More than 90% of the SAV was lost after Hurricane Irma and the stressors continue to stunt the return of the grasses.

Though Hurricane Ian (September 2022) did not have the sheer magnitude of water in comparison to Irma, the St. Johns still saw as much as 20 inches of rainfall in the upper and middle basins, not including the water that had yet to make it downstream from the headwaters. This caused continued flooding of homes and businesses near the river for weeks. When storms like these make landfall, another concern is wet weather sewage system discharges and the pollution that can result from runoff. Ian also saw damage to septic systems, spilling millions of gallons into Florida waterways.

Tropical Storm Nicole (November 2022) was less extreme than Hurricane Irma, but the fact that it landed on the East coast impacted the St. Johns River more quickly and directly than Irma or Ian (which landed on the Southwest coast). Additionally, its path was significantly wider. Nicole also claimed the area's worst storm surge since the early 1900s (with the exception of Irma), reaching 3.57 feet (News4JAX, 2022), which when combined with wind gusts of 70 mph, sent repeating bulges of water into the river mouth.

Storm impacts are even more disastrous in areas where wetlands have been reduced; under normal conditions, the river's network of vegetation and wetlands act like a sponge by slowing the flow, absorbing nutrients, and filtering out sediment. When the wetlands are reduced through human impacts (i.e. dredging the river, industry, residential housing and commercial real estate), the river's natural ability to slowly filter runoff is inhibited. This increases flooding in areas near the river and increases the risk of toxins, turbidity, and nutrient runoff, which can cause extreme harm to SAV health.

Historically, our river's grasses bounced back after extreme climatic conditions, but SAV abundance and diversity has not bounced back since the 2017 die off. This failure to recover underscores the importance of identifying and understanding all of the stressors as they relate to SAV.

Grazing Pressure

Evaluating grazing pressure is a common enterprise used to understand the potential causes for SAV loss. Several expedition residents had fences installed to allow the grasses offshore to grow without grazing pressure. Blue crab, turtles, and manatees are some of the known dominant grazers of SAV. Other species like invasive tilapia damage SAV by disruptive behaviors in feeding and nest building. Grazing pressure has not historically been a major stressor of SAV due to the naturally abundant grasses. However, due to other stressors (primarily light attenuation, salinity, and water quality), SAV is unable to increase its growth rate (Morris & Tomasko, 1993) and build the biomass (Goldberg, et al., 2020) necessary to revive the once-ample beds throughout the river. This creates a ripple effect up the trophic chain and starves aquatic wildlife that rely on SAV.

Dan Kolterman, project manager for FWC's aquatic habitat restoration and enhancement section, stated "these seagrasses are one of the most important biological components of the river. These grasses provide key ecosystem services including nursery and foraging habitat for many species of fish and wildlife, they help bind up nutrients, stabilize the sediments, and wave energy attenuation. Fence enclosures are being used to protect areas of both submerged and shoreline vegetation from plant eating animals until the plants become established." (Palatka Daily News, 2023).

Blue Tilapia with Mullet on the Silver River. Photo was taken during the Florida Springs Institute Silver River Fish Count On July 19, 2021. *Florida Springs Institute*

While blue crab, turtles and manatees have been established as known grazers of eelgrass in the St. Johns, blue tilapia have recently exploded as another threat, further exacerbating grazing pressure with their disruptive behaviors. Blue tilapia (*Oreochromis aureus*) are an invasive species to the United States and their establishment in Florida dates back to the 1960s. They were introduced predominantly by commercial and state entities for a multitude of reasons, one being as a method of aquatic plant control. The historical introduction of blue tilapia is troublesome, especially in areas like Silver Springs where the species now comprises 88% of the total fish population (Moody, 2021). Their invasive nature and resilience to SAV stressors (high salinity and poor water quality, in particular) provide more understanding of the hazard tilapia can pose for natural aquatic vegetation, including eelgrass. It has been observed that tilapia tend to burrow and further disturb the grasses. While more research is needed to determine their entire effects on SAV, with numbers increasing due to fewer hard freezes, tilapia will be examined further to determine their threat to the river and its native species.

Summary of SJRK May 2023 Expedition Findings

Ultimately, SJRK was saddened at the overarching absence of SAV abundance and diversity during our May 2023 Expedition. Historically, the St. Johns River hosted a diverse array of up to 11 different grass species, but that diversity has dwindled to a mere echo of what it once was. Below is a summary of the May 2023 Expedition findings that start at the northernmost sites and transition to the southward sites.

- No SAV was found in Doctor's Lake (Site 1) or Fruit Cove (Site 2). *(SJRK revisited Site 2 June 29 due to SAV found 23 meters off shore. See Attachment B).*
- Short, stunted SAV was found in Colee Cove (Site 3).
- No SAV was found in Tocoi (Site 4). *(Site added on May 31).*
- SAV presence was most abundant at Dancy Point (Site 5). Longer SAV was found in caged off areas that are protecting grass from gazers – turtles, tilapia, manatees, etc. Epiphytes were found growing on the SAV, which can block light and hinder photosynthesis.
- Short, stunted grass was found just north of Dunn's Creek at the San Mateo sites (Sites 6-8) with longer SAV found within a protected area.
- South of Dunn's Creek (Sites 10-12), we found only *Chara* sp. which is a type of grass-like algae that is present where healthy eelgrass once thrived. The scientific literature (Vermeer, et al., 2003; ScienceDirect, 2023; MDC, 2023) about Chara remains relatively unclear about the nutrient conditions in which Chara thrives; one aspect not under debate, however, is its smell - Chara's infamous odor has earned it the common name of "muskgrass." SJRK was initially concerned that the dominant presence of Chara was a bad omen, but has since learned from SJRWMD scientists that Chara is considered a "pioneer species" that returns to formerly light-deprived areas. This may be an indicator that eelgrass and other SAV species may return in the future.
- Potentially toxic cyanobacteria were confirmed in water samples taken from the St. Johns River in San Mateo (Site 7) and Drayton Island (Site 12). Sediment samples from Lake George (Site 13) that were green from algae also tested positive for potentially toxic cyanobacteria. Fortunately, further analysis showed only low levels of toxins present at the time of our Expedition. *(See Attachment G.)*

The May 2023 SAV Field Log enumerates these findings in more detail, along with in-depth site descriptions.

Next Steps

SAV is critical to the health and productivity of the St. Johns River. SJRK's findings, as well as those documented by state and federal agencies, are a stark reminder of how much is at stake, how fragile the St. Johns River truly is, and the enormous amount of work that is still required.

Saving our river depends on an all-hands-on-deck, data-driven effort from all who desire a healthy St. Johns River. We must do all that we can to protect existing SAV and to restore the river's health, foster a resurgence of river grass that has been lost, and reduce stress to the river's struggling SAV. This requires offsetting saltwater intrusion, protecting and restoring freshwater flow, reducing the threat of blue green algae outbreaks, and making our river more resilient to increased storm frequency. It also requires the avoidance of additional stress and degradation of SAV from increased development, water withdrawals, dredging and overuse of our aquifer. Protective policies, conservation practices, and restoration must be priorities to *SAVe the St. Johns River's grasses.*

Potential Solutions and Future Opportunities

Our river deserves a holistic approach and full exploration of all potential remedies. Solutions available comprise a mix of restorative, protective, and preventative measures and policies. These include freshwater flow restoration, nutrient pollution reduction, land and water conservation, resilience efforts, protective development strategies, and protective barriers. The table below portrays an overview of the stressors to SAV and potential solutions.

One natural solution is to Reunite the Rivers, restoring the historic connection of Silver Springs, the Ocklawaha and the St. Johns Rivers as nature intended. Restoring the natural flow of the Ocklawaha River will increase freshwater flow by more than 150 million gallons a day, restore 20 lost springs of the Ocklawaha, and restore 7,500 acres of forested wetlands that will absorb nutrients, filter sediment, and provide natural flood control. This endeavor will also reduce salinity intrusion downstream and reduce light attenuation in the water column by improving water clarity and reducing frequency of harmful algae blooms.

Protective, conscientious regulation of development is another solution. Environmentally irresponsible development leads to loss of riparian buffers while increasing turbidity and nutrient pollution. Sustainable development like pervious pavement and more native green buffers will protect SAV, reduce risk of flooding and maintain the land's natural methods of pollutant filtration and shoreline stabilization.

Protective measures are needed to prevent sewage sludge land disposal and other nutrient sources from causing algae blooms and polluting our waterways. More septic to sewer, sewer infrastructure upgrades and more sustainable agriculture practices to reduce nutrient runoff is also warranted.

Several agencies have implemented or are currently expanding various efforts to address stressors to SAV and to invigorate the ecosystem services provided by our estuary. The SJRWMD's core missions surround water quality, water supply, flood protection, and natural systems. In support of these missions, SJRWMD provides cost-share programs to reduce nutrient pollution, monitors our waterways, and purchases conservation land.

FWC began fencing efforts and eelgrass plantings in 2020 in an attempt to restore SAV seed banks and bed lengths.

Individual community members can also be positive influences in this endeavor to *SAVe Our River's Grasses*. Nutrient pollution can be reduced by river-friendly fertilizing practices. If you use fertilizer, select a slow-release nitrogen fertilizer with zero phosphorus that does not contain herbicides or pesticides. Other options include limiting Spring fertilizer application until your lawn is fully established, refraining from fertilizer use in the rainy season and planting native plants to reduce groundwater and fertilizer use.

Resiliency efforts like living shorelines for residents who live along the river can also protect SAV. This reduces wave action that rips SAV from the littoral zone, allows more shore stabilization, and reduces turbidity by limiting total suspended solids.

Together, we can make a difference.

SAV STRESSORS & SOLUTIONS

HOW IS IT ALL CONNECTED?

SOLUTIONS / STRESSORS	Reunite the Rivers	Nutrient Pollution Reduction	Land Conservation	Water Conservation	Resiliency Efforts	More Protective Riverfront Development	Fencing
Saltwater Intrusion	●			○	●		
Light Attenuation - HABs	●	○	●			○	
Light Attenuation - Turbidity						○	
Light Attenuation - High Water/Color	●			○			
Future Development			●		●	○	
Loss of Freshwater Flow	●			○			
Grazer Pressure	●						●

THE EXPEDITION CONTINUES

The next SJRK *SAVe the River's Grasses Expedition* is August 1-4, 2023. We will collect more data and continue our conversation with homeowners, anglers, river enthusiasts, business owners and scientists to better understand our river and its significance to our communities, our economy and our lives.

On August 2, we will host a community conversation at Azalea City Brewing in Downtown Palatka to discuss how we all can work together to SAVe the St. Johns with scientists who have spent their careers protecting our river.

The SJRK team will continue to meet with agencies and review data currently being tracked by SJRWMD, USACE, and FWC to contribute to our understanding of the St. Johns River's SAV loss and the solution to its return.

We ask for your help to advocate for swift action to foster the return of SAV and its unparalleled ecosystem services, to SAVe the St. Johns for today and for future generations.

If you would like to get more involved, please visit StJohnsRiverkeeper.org and explore our various opportunities to advocate for solutions, *Get Your Feet Wet*, participate in volunteer cleanup projects, join our young professionals group Rising Tides, or become a River Patrol member to monitor and/or report violations related to pollution, marine debris, animal sightings, and more. To report an algal bloom, hazardous material/marine spill, wetland violation, illegal discharge, construction site runoff, solid waste concerns, etc., please contact report@sjrk.org.

SJRK also wants to express its gratitude to the homeowners, anglers, and scientists that have been instrumental in the kickoff of this effort and for our ongoing partnership to *SAVe our River's Grasses*.

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