Background
Kelly Park, located within the Wekiva River Basin, is an incredibly diverse ecosystem. It is composed of springs, streams, pine flatwoods, and wetland prairie ecosystems. A large variety of life is supported in the park, ranging from fish and turtles to a vast list of aquatic macro-invertebrates. Aside from its bountiful diversity, the park offers an array of recreational activities, such as tubing, canoeing, hiking and snorkeling [1]. Rock Springs is located within Kelly Parks’ boundaries and feeds the Wekiva River. The river is available for recreational use and the majority of the upper Wekiva Watershed is preserved as state and county lands [2].

Data Results: Stream Condition
SCI (Stream Condition Index) is a method used by biologists to determine the health of a stream's water quality.

- Scores range from 0 to 100
- A biologically impaired ecosystem is indicated when two SCI's average 40 or below.

From a biological standpoint, the data below indicate that the sampled stream is bordering impairment.

- Score reduced approximately 4 points within the first 3 years, but plummeted in 2017.

Lower scores are often attributed to eutrophication of a system, where high nutrient content can result in mass algal blooms. Many factors cause this, but a common source in the Wekiva basin is septic tank seepage [3].

Figure 1. Wekiva River looking upstream towards Rock Springs (Taken by Tina McIntyre)

Figure 2. Rock Springs SCI Data: Score of 45 in 2008, score of 41 in 2013, score of 41.5 in 2016, score of 26.5 in 2017
Data Results: Diversity Index
Shannon Weiner Diversity Index (SWDI) is a formula that is used to calculate species diversity and evenness within a given sample.

- The higher the SWDI score is, the more diverse the site.
- Samples collected on 3/25/2008 show a biodiversity that is similar to those taken on 2/10/2016 (2.98 and 2.95, respectively). Data from 6/25/2013 received a score of 3.15, showing a higher diversity than the 2 preceding samples and the most recent sample collected.
- This spike could potentially have been due to local weather patterns, recreational use or pollution; further information is needed to parse out the cause.

Data Results: Habitat Assessment
Habitat assessments help determine the overall quality of the aquatic system being tested. Several parameters help us obtain a score for the stream:

- **Substrate diversity**: the presence of multiple types of major stream habitats where aquatic macroinvertebrates live, including vegetation, roots, rocks, snags, dense packs of leaves. A poorly scored system would likely have <5% of productive habitat.
- **Water velocity**: Water flow receives a lower score because it's associated with less dissolved oxygen, which results in greater stress for the inhabiting organisms. Slow water velocity (<0.05 m/s) will lead to a poorer score.
- **Bank stability**: When the banks of the stream are >60 degrees and there is erosion of sediment taking place the stream will receive a lower score.

BWKP scored relatively well for the Habitat Assessment in each of the sampling years below; 160 is a ‘perfect’ score.

![Rock Springs SW DI Data](image1)

![Rock Springs HA Data](image2)
Invasive *Tarebia*
*Tarebia* are a species of Thiaridae, a family of snails that primarily inhabit freshwater systems but can also be found in brackish water. They were brought to Florida from Southeast Asia and are heavily populated, enabling them to displace native snail species.

*Tarebia* have a recorded abundance in some springs and streams in Florida. OCEPD Biologist suspect that *Tarebia* are present at Rock Springs within Kelly Park [4].

Native *Elimia*
*Elimia* is the only genus of Pleuroceridae, a family of freshwater snails, that is known to inhabit Florida. With over 500 described species, it is the largest genus existing in the family. OCEPD Biologists have found native *Elimia* at Rock Springs within Kelly Park and suspect that they are hybridizing with or getting displaced by the invasive *Tarebia*.

Lyngbya

*Lyngbya* is a harmful species of cyanobacteria that, in large quantities, has been shown to have negative impacts on the environment. Appearing as thick mats on the underwater surface of dead trees, rocks or the bottom substrate, it is uncharacteristically dense in Rock Springs. Toxins may be present in the matted filaments of *Lyngbya*, so human contact is not recommended.

Some species of *Lyngbya* are correlated with increasing nutrient levels in the water column, such as nitrogen, phosphorus, iron and dissolved organic matter [6].
Species Spotlight– *Palaemonetes paludosus*

*P. paludosus* is a filter feeding decapod that thrives in densely vegetated freshwater systems, such as Rock Springs in Kelly Park. Covering a vast geographic range in North America, they have been documented in various locations on the Eastern coastal plain as well as in California, Oklahoma, Louisiana, and Texas.

![Figure 7. Close up image of *Palaemonetes paludosus*](image1)

They are a mainly nocturnal species, remaining near the bottom of the lake or stream during daylight to reduce the risk of predation; their lifespan does not surpass a year. They contribute tremendously to the ecosystem by playing a role in energy cycling and detritus turnover, as well as keeping rock sedimentation at a minimum [7].

![Figure 8. 100 meter stretch of Wekiva River where the SCI is conducted](image2)

References:


