landscape-scale aquatic fauna Monitoring for cerp 2005-2017

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The Comprehensive Everglades Restoration Plan (CERP) Monitoring and Assessment and Planning (MAP) project has completed thirteen years of data collection as of 2017. Every wet season, 146 sites are visited throughout the Greater Everglades to obtain data on small fish and macroinvertebrates, in addition to periphyton. The focus of this project is to track wading bird prey, including small fish, grass shrimp, and crayfish density and biomass at the site, region, and landscape. System-wide, the relative abundance of biomass of fish and crayfish is inversely related to hydroperiod in the 365 days prior to wet-season sampling. As the areal coverage of drying in the preceding dry season increases, the relative proportion of wading-bird prey biomass coming from crayfish increases. There is a spatial gradient in this effect, with the southern Everglades (primarily in Everglades National Park) contributing more crayfish prey than areas to the north (Water Conservations Areas 3, 2, and Loxahatchee National Wildlife Refuge). We have found that the system-wide average of small-fish density is diminished in years with extreme hydrology, dry or wet. In contrast, system-wide crayfish density generally increases as years are progressively drier. Grass shrimp, a prey item most important for small wading birds such as Little Blue Herons, displayed no system-wide patterns of biomass or density associated with hydrology. This project also documents spatial and temporal patterns of non-native fish, notably, a dramatic increase their density and biomass in the Shark River Slough and Taylor Slough starting in 2012 and continuing through 2017.

Even though there was above average rainfall during the wet season in 2017, this particular sampling period was moderately dry because of a lack of rain in the dry season (December through May). Of the 134 primary sampling units (PSUs) we sampled this year, 66% dried to 5cm or less in the 365 days before sampling. The system-wide average density of fish in the 2017 wet season was just over 5 fish/m2, which was second from the lowest of the study. This was the third year of declining fish density since 2014, when the system-wide density was among the highest of the study (approximately 17 fish/m2). In 2014, the incidence of non-native fish peaked at approximately 25% of PSU’s sampled. That frequency dropped to 15% in 2015, increased to 20% in 2016, and decreased again to 15% in 2017. Crayfish density in 2017 was down from the previous year, with densities decreasing in every surveyed area. Grass shrimp density was also low throughout the study area in 2017, continuing the trend of decreasing densities that began in 2009. As we continue sampling with this project, information on hydrological effects on prey density and biomass may assist with estimating wading bird nesting success.

BIO (50-word maximum): Somers Smott is a Research Technician at the Southeast Environmental Research Center at Florida International University with 2 years of experience assisting with Everglades restoration monitoring and research projects. In 2016, she earned her Master of Professional Science degree from the Rosenstiel School of Marine and Atmospheric Science at the University of Miami.

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