

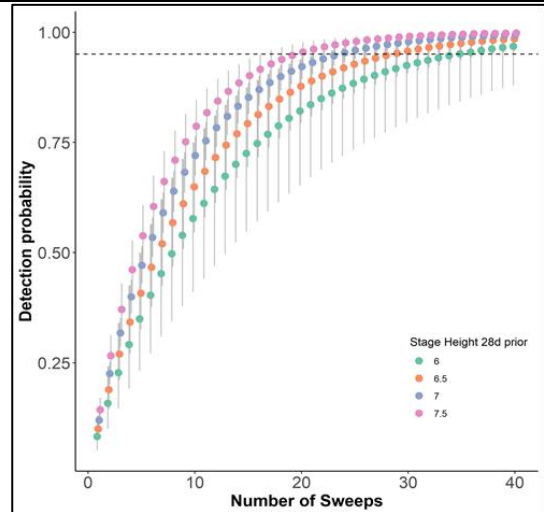
**Panama City Crayfish (PCC) (*Procambarus econfinae*) Population Monitoring and Analysis Protocol: Final Report (Bay County)**

2022- 2023

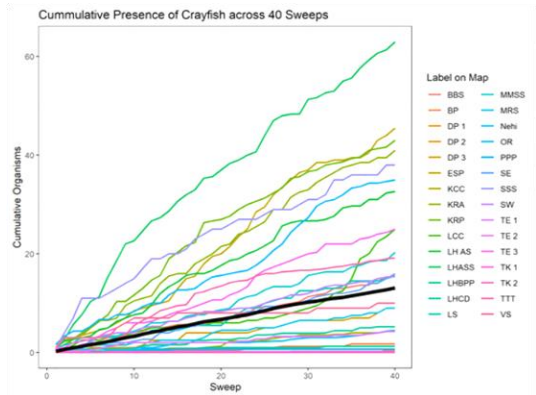
Client: Florida Fish and Wildlife Conservation Commission (FWC) (with Environmental Resource Consultants)

**Project Summary**

Frydenborg EcoLogic designed a pilot study and conducted a series of statistical analyses to recommend procedures for a scientifically defensible monitoring strategy to assess the status of the Panama City Crayfish (*Procambarus econfinae*), a federally threatened species. Occupancy modelling, employing a hierarchical regression approach, indicated that opportunistic sampling for PCC should occur when the Econfina Creek gage averages 6.5 ft or higher for the previous 28-day period, and that 22 dipnet sweeps are required to detect a PCC at the 90<sup>th</sup> percent confidence interval. Non-metric Multidimensional Scaling (NMDS) Analyses indicated there was no clear pattern that certain plant species were consistently associated with high PCC abundance. Random Forest Modeling indicated that antecedent (and current) water level was the most critical factor associated with PCC presence and abundance. PCC abundance was best predicted by the Econfina Creek stage height for the 28-day period prior to sampling (USGS Station 02359500, near Bennett in Bay County).



**Innovative approach**



Based on our ecological experience and statistical knowledge, Frydenborg EcoLogic worked with FWC and Environmental Resource Consultants to design the pilot study and analyze the resulting data through a variety of statistical techniques. Although water quality was traditionally thought to be a major driver of PCC populations, these factors were not as important as hydrology in Random Forest Modeling. FWC now has a validated monitoring method for this federally threatened species of crayfish.

Project Manager: Russ Frydenborg  
 Sampling: Russ Frydenborg, Beck Frydenborg  
 Data analysis and GIS: Beck Frydenborg  
 Report: Russ Frydenborg, Beck Frydenborg

Contact: John Tobe [jtobe@ecoresource.com](mailto:jtobe@ecoresource.com)  
 850-933-8107