

# A More Comprehensive Approach for Determining Juvenile Snook Nursery Habitat within a Tampa Bay Wetland

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# Background/purpose

- Coastal development is altering the natural landscape of Florida
- A large number of species utilize subtidal wetlands for nursery habitat including common snook (*Centropomus undecimalis*)
- Large number of snook collected in Frog Creek and adjacent ponds
- Most fish habitat studies only utilize abundance data
- Purpose – assess habitat utilization for YOY common snook (*Centropomus undecimalis*)
  - Use a variety of metrics (Abundance, habitat features, general health, diet, isotopes)
  - Compare by location
  - Compare by site type

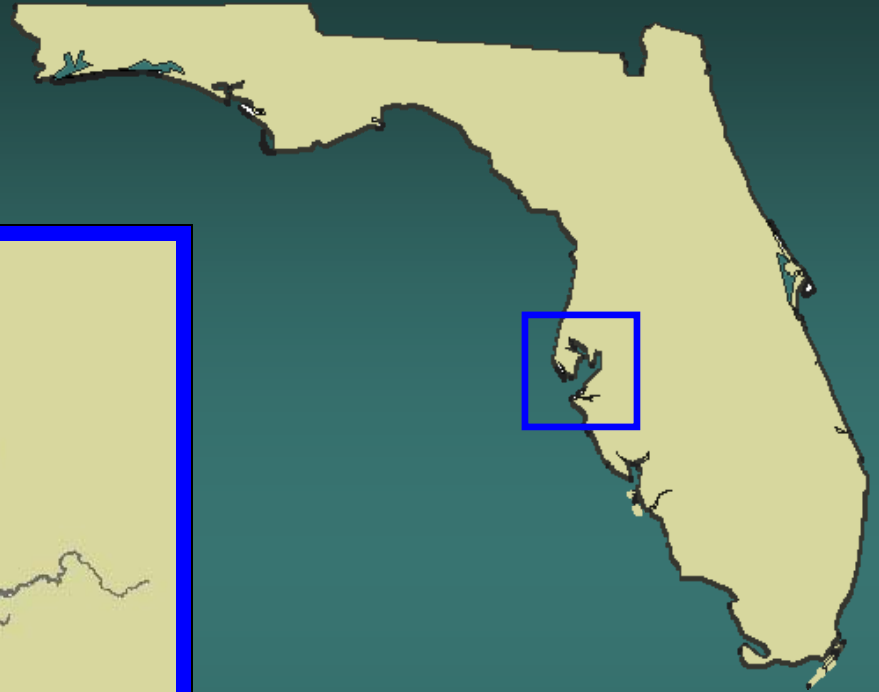
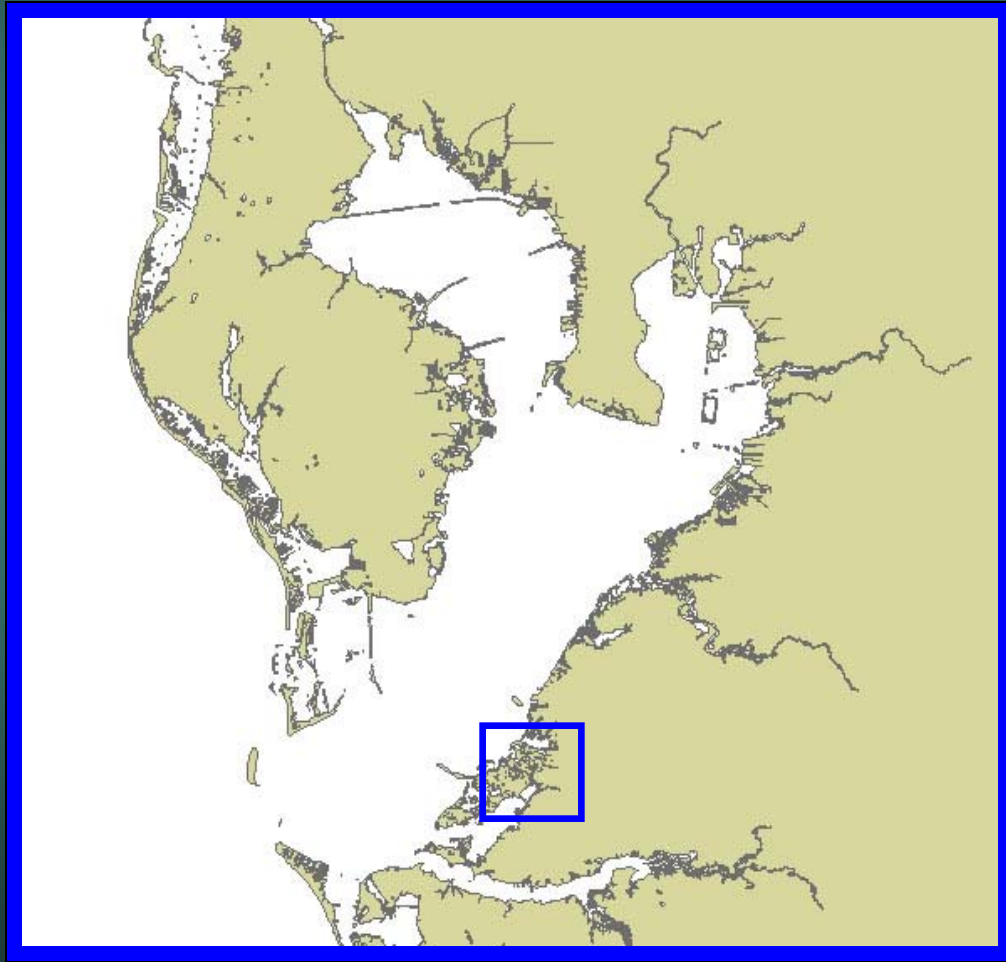


Courtesy of [www.extremecoast.com](http://www.extremecoast.com)

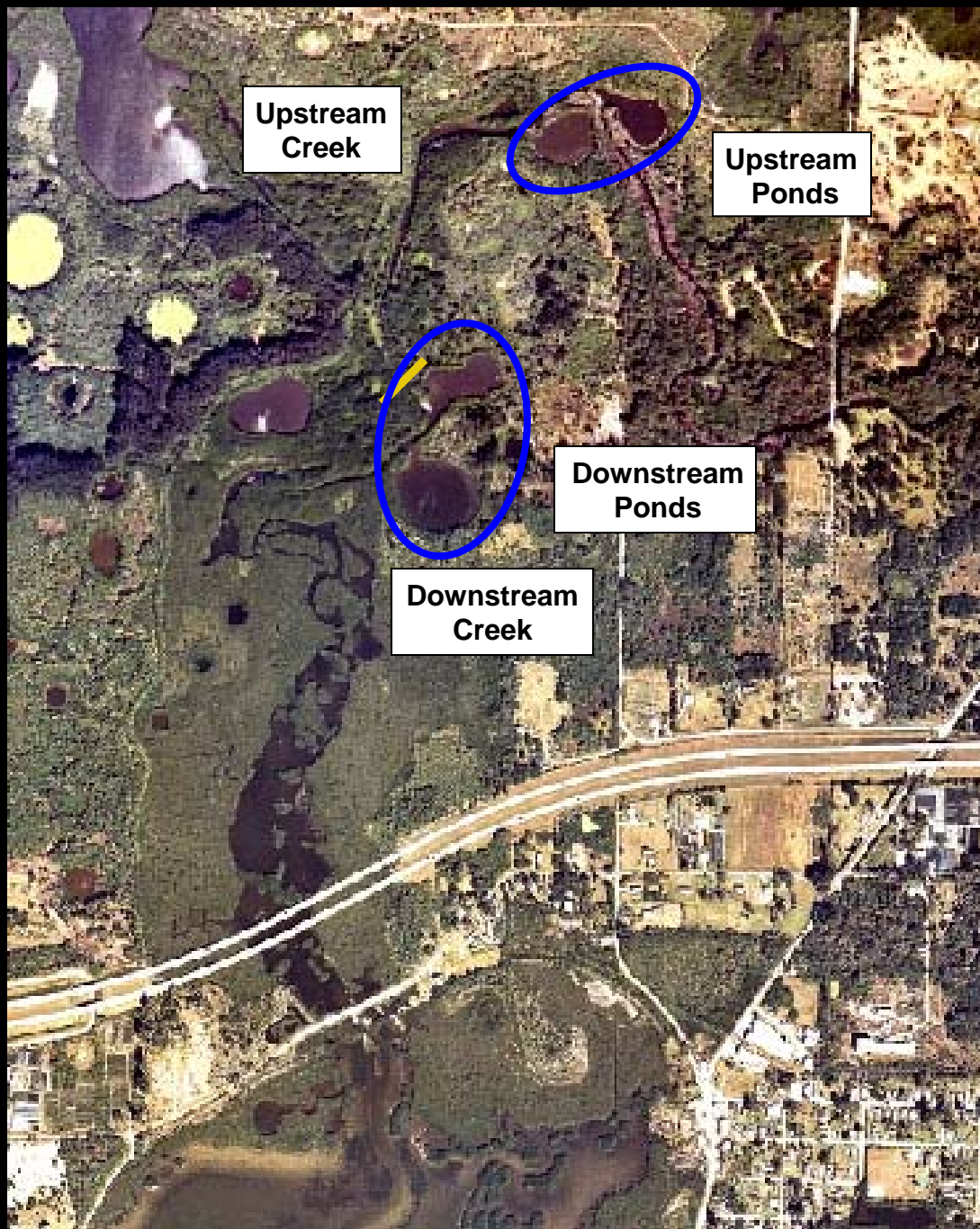
# Snook basics

- 4 species of snook in Florida
  - Common snook largest and most abundant
- Range restricted by temperature
- Estuarine dependent
- Occupy a variety of estuarine and coastal habitats
  - Dependent on time of year and life stage
  - Juveniles recruit to subtidal wetlands
- Relatively long lived (up to 20 years)

# Tampa Bay



# KEERC gorrT



# Sample Methods

- Sampled during juvenile snook fall recruitment
- 6 samples were collected from each of the 4 habitats each month
- Sites randomly generated
- Collected fish, habitat, and water quality data at each site
- Fish collected using 9.1m haul seine (3mm mesh)

# Seine method

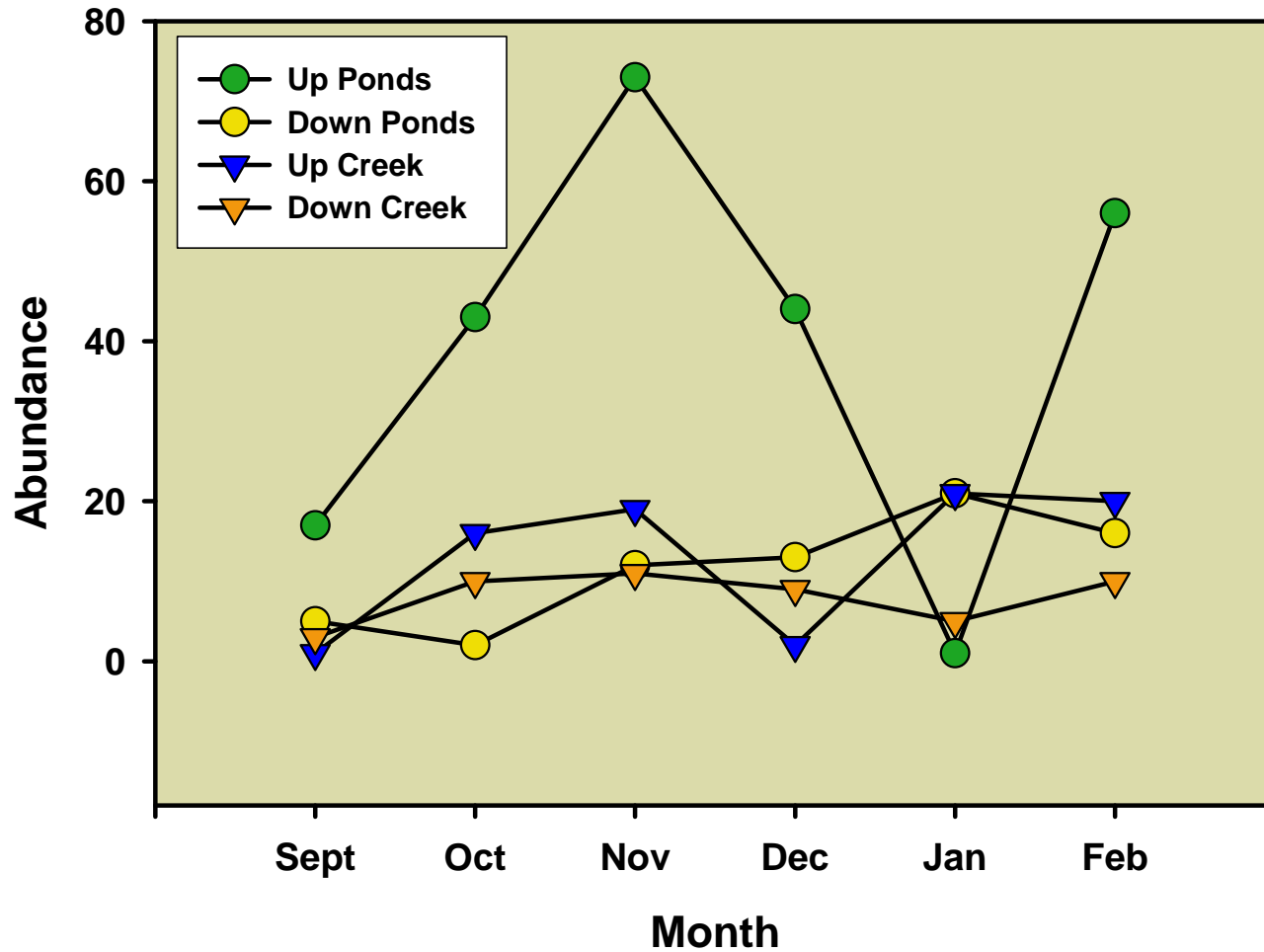


# Sample summary

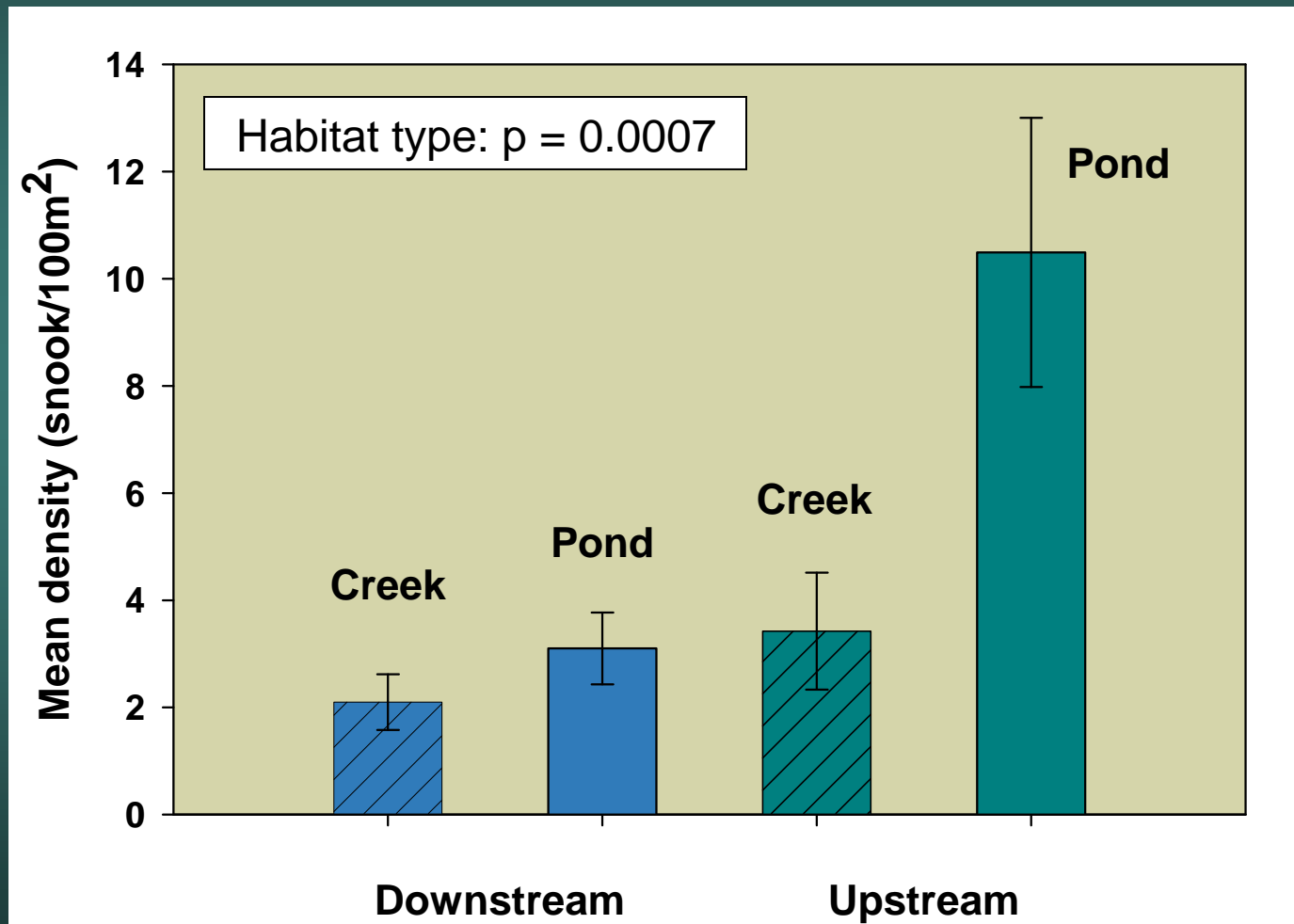
- 144 total samples collected (36 from each of the 4 habitats)
- 456 snook were collected
- Size range 16mm SL – 530mm SL
- Frequency - 57% of samples contained snook (82/144)

	Creek	Pond
Overall	48.6%	63.9%
Upstream	47.2%	69.4%
Downstream	50.0%	58.3%

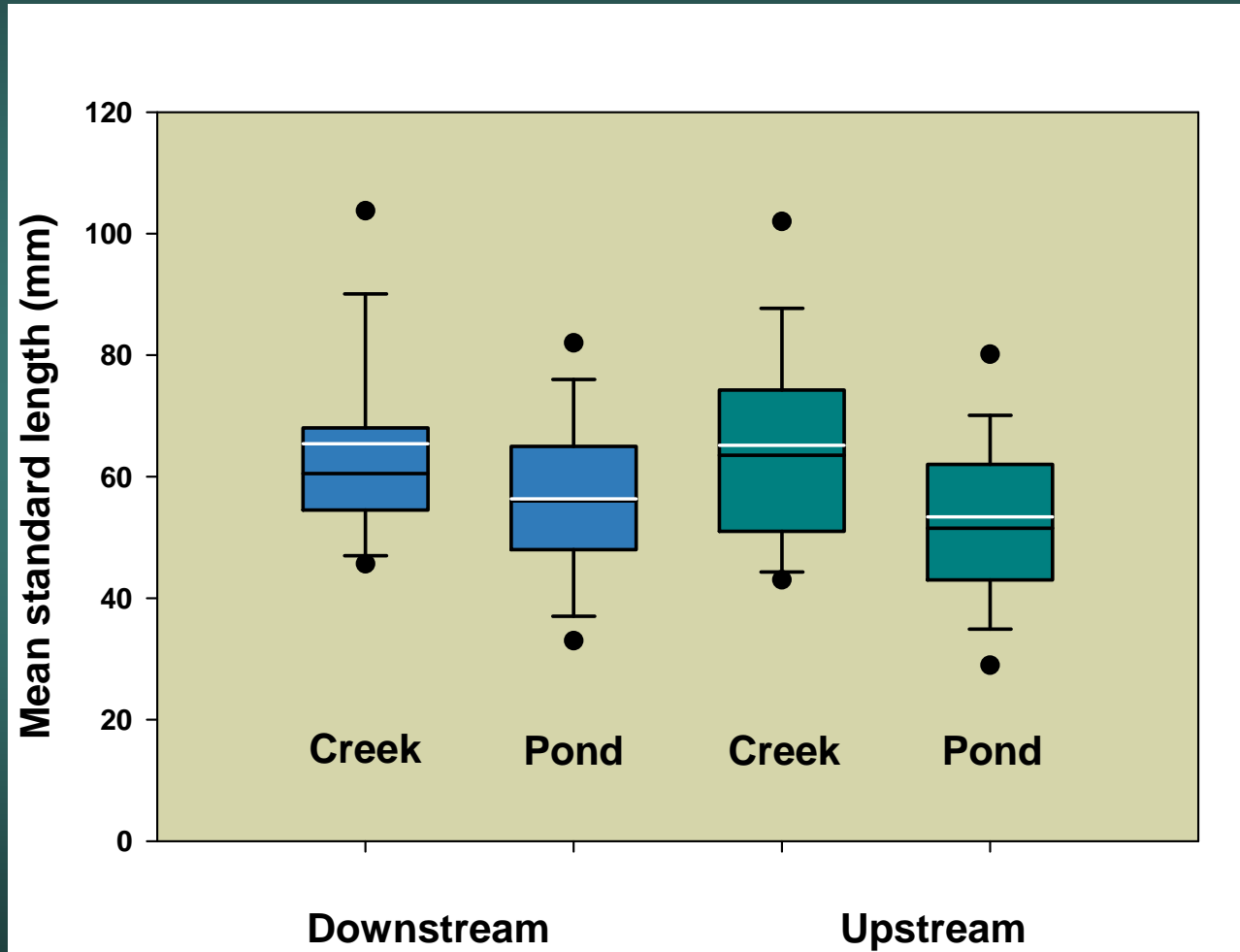
# Monthly comparisons



# Mean density data



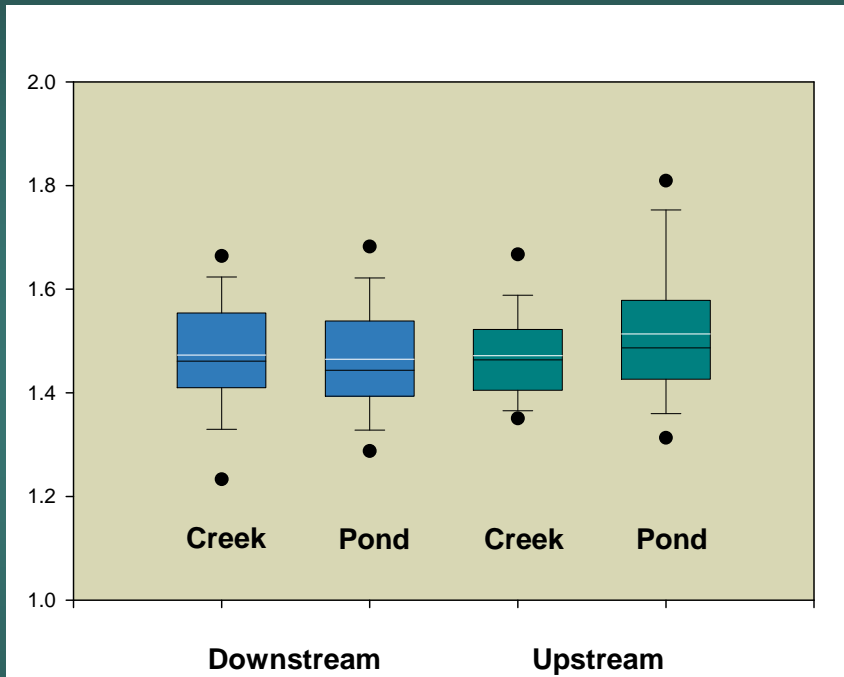
# Snook length data



Statistical difference in standard snook length by habitat type ( $p < 0.0001$ )

# Condition factor (K)

$$K = \frac{100,000w}{L^3}$$

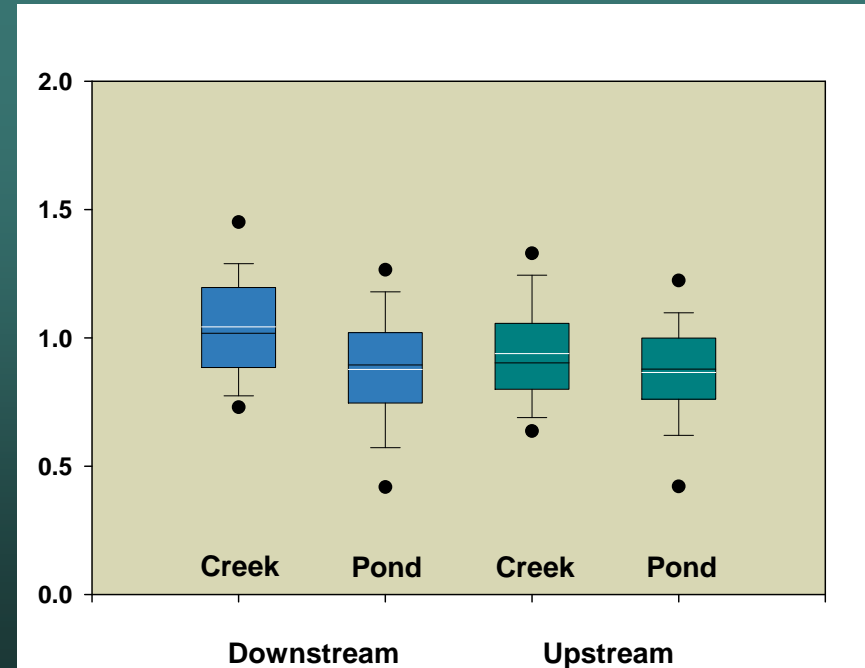


No differences in condition factor

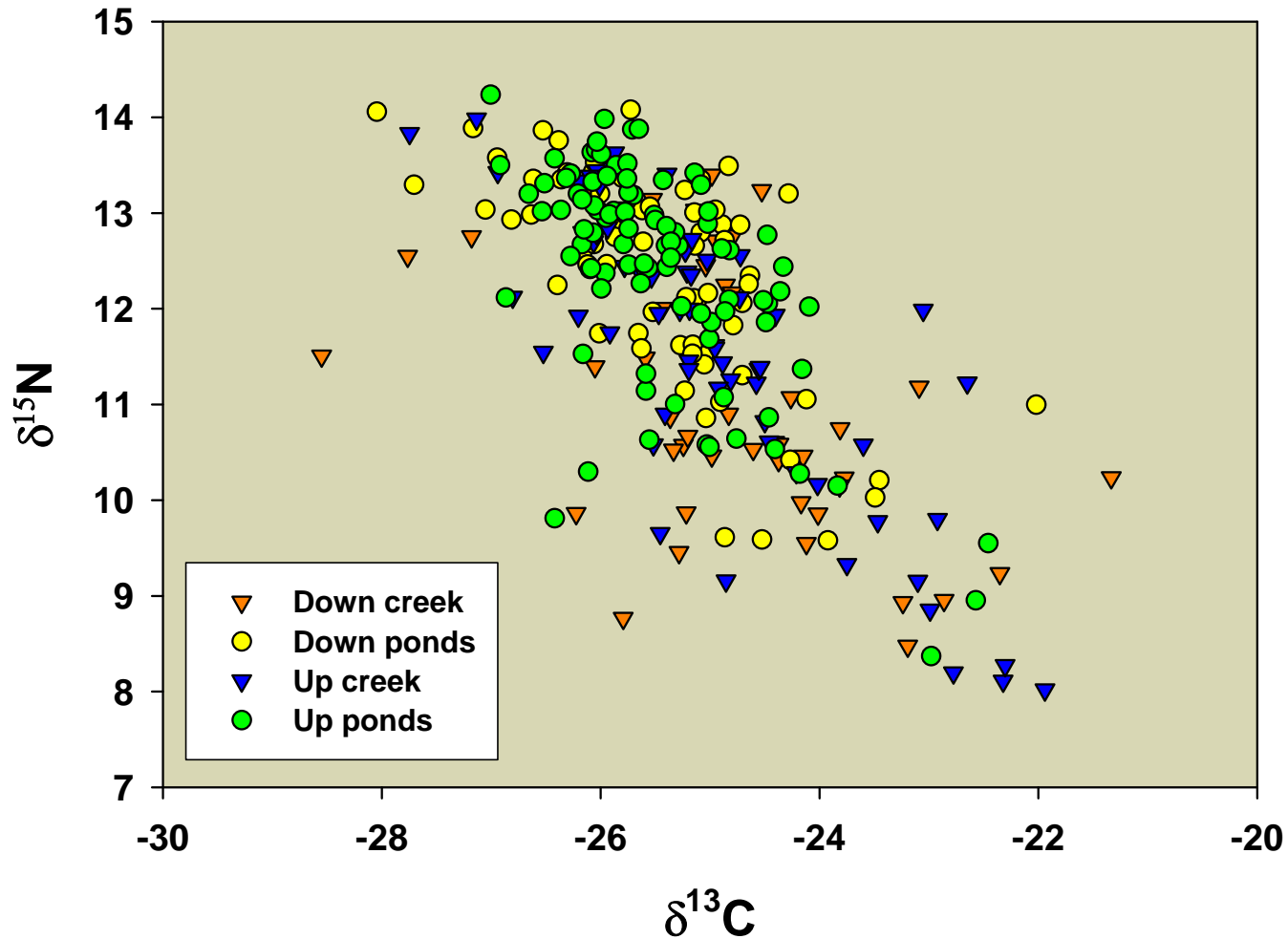
Statistical differences in Hepatosomatic index for both site type ( $p < 0.0001$ ) and location ( $p = 0.048$ )

# Hepatosomatic index (HSI)

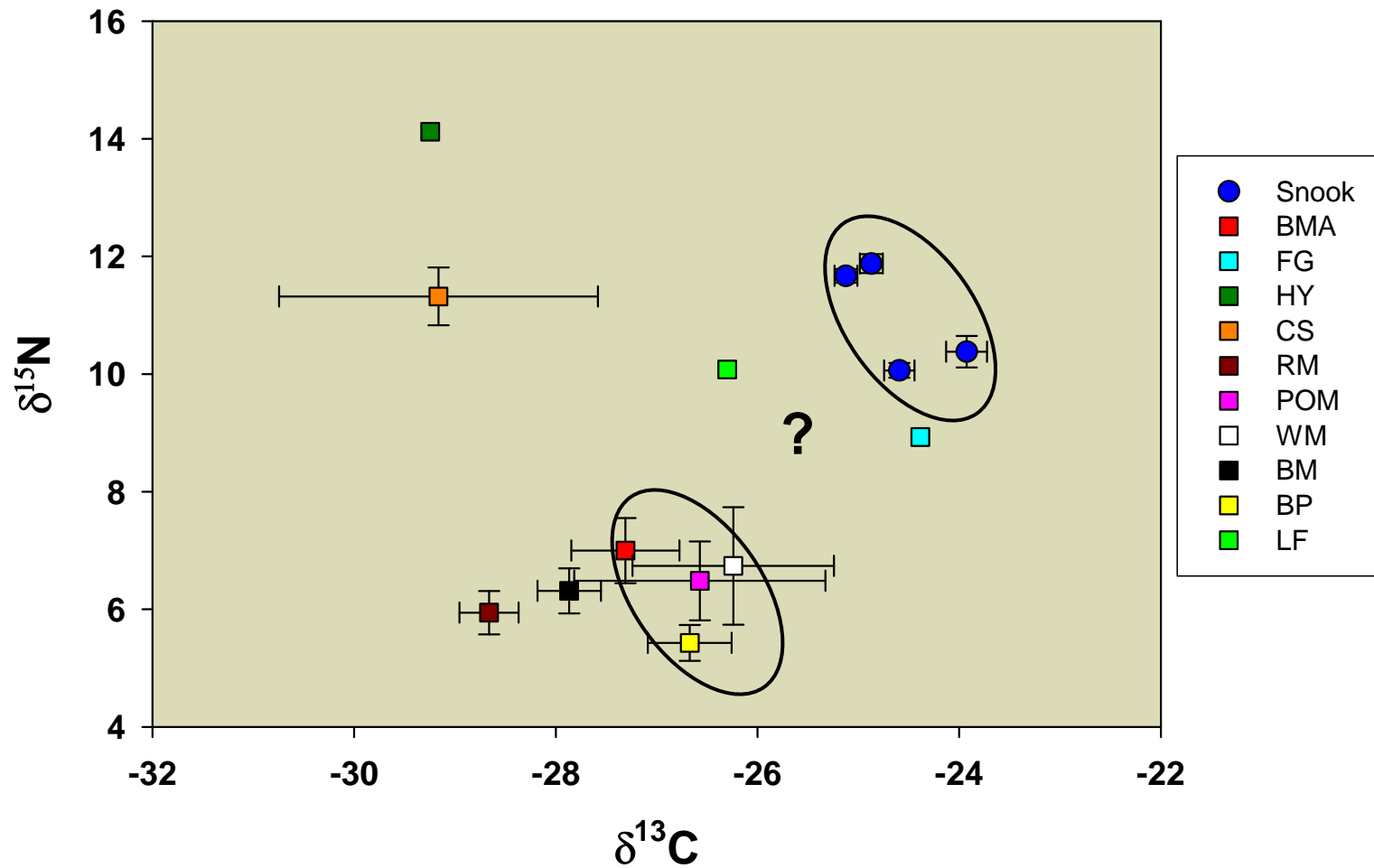
$$HSI = \frac{\text{Liver weight}}{\text{Fish weight}} \times 100$$



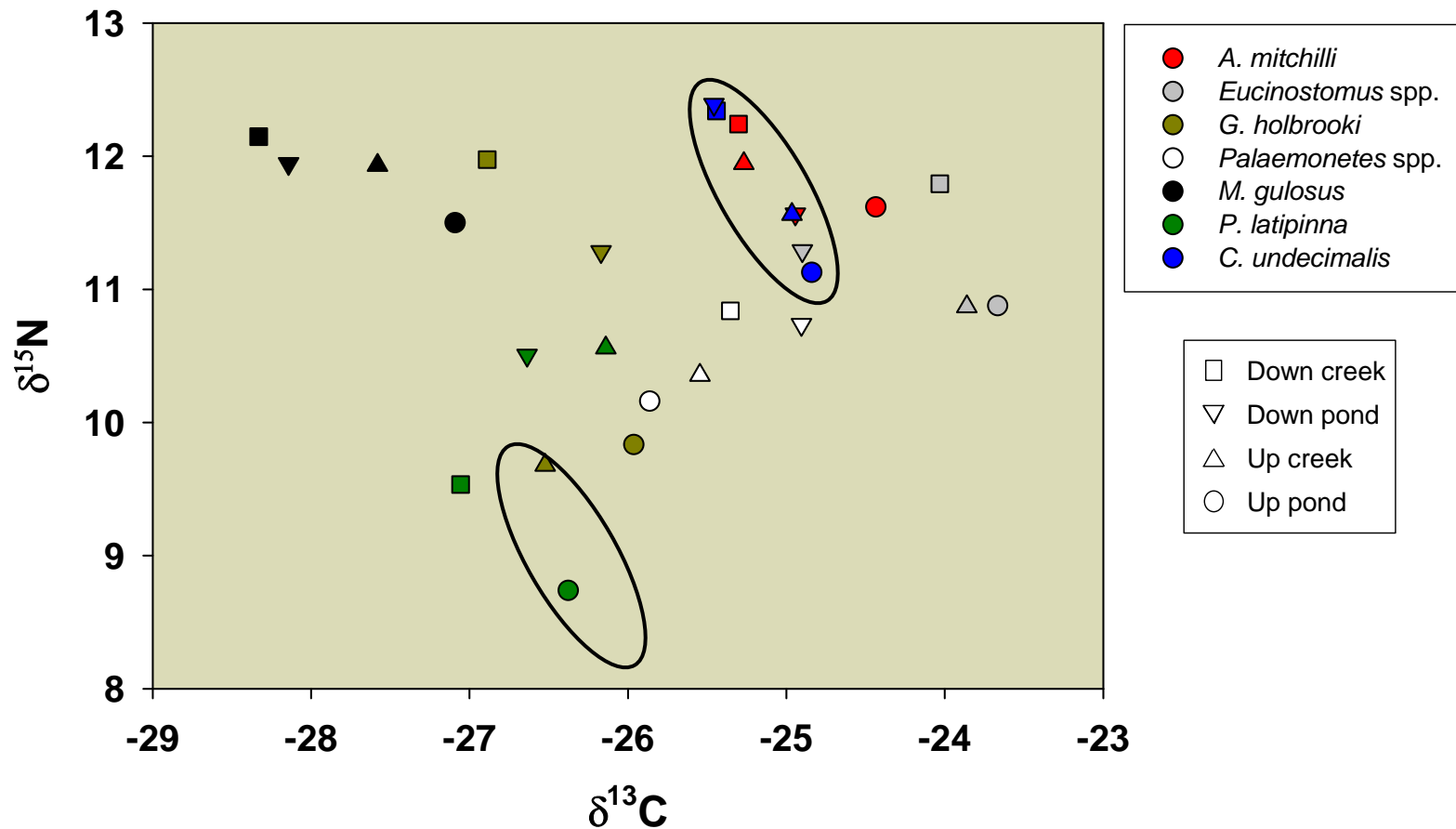
# Isotopic signatures of snook



# Linking snook to the ecosystem



# Linking snook to prey



# Conclusions

- Abundance
  - Snook abundance varied by habitat type ( $p = 0.0007$ )
  - Upstream ponds appear to be “preferred” habitat
- Length
  - Snook from creek sites were statistically larger than those from ponds ( $p < 0.0001$ )
  - Suggests an ontogenetic shift?
- Structural/general health indices
  - No difference in condition factor between habitats or locations
  - HSI varied by both habitat type and location - snook from the downstream creek had the highest hepatosomatic index
- Isotopic analysis
  - Snook from ponds are significantly more enriched in nitrogen ( $p < 0.0001$ ) and depleted in carbon ( $p < 0.0001$ ) than creeks
  - Particulate organic matter and benthic microalgae make up the base of the snook food web

# Future work

- Compare snook abundance with other species and habitat variables
- Utilize mixing models to better understand patterns in the isotope results
- Gut content analysis

# Acknowledgments

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