

# Trophic Ecology of Gulf Killifish in created and natural marshes

## Introduction

Gulf Killifish (*Fundulus grandis*) inhabit brackish waters of the Gulf of Mexico. Potential threats to the Gulf Killifish include coastal land loss due to the degradation of their habitat. Solutions to coastal land loss are marsh creation projects. Understanding the trophic ecology of Gulf Killifish could help indicate the success of these projects

## Objectives

(1) Use  $\delta^{15}\text{N}$  and  $\delta^{13}\text{C}$  values to test for ontogenetic shifts in trophic position and carbon sources. While (2) comparing trophic position and basal carbon sources in natural and created marshes.

## Methods

- 4 sites: 2 created (LHA and LHB) and 2 natural (LHC and WPH2).
- Minnow traps deployed at each site.
- Fish were dissected and white muscle tissue was collected, dried, and prepared.
- Two-way ANOVA test used to determine significance of site and sex on stable isotope values.
- R packages “tRophic position” and “SIBER” to analyze data.



Fig. 1 - Study Site in Barataria Bay, Plaquemine Parish, LA

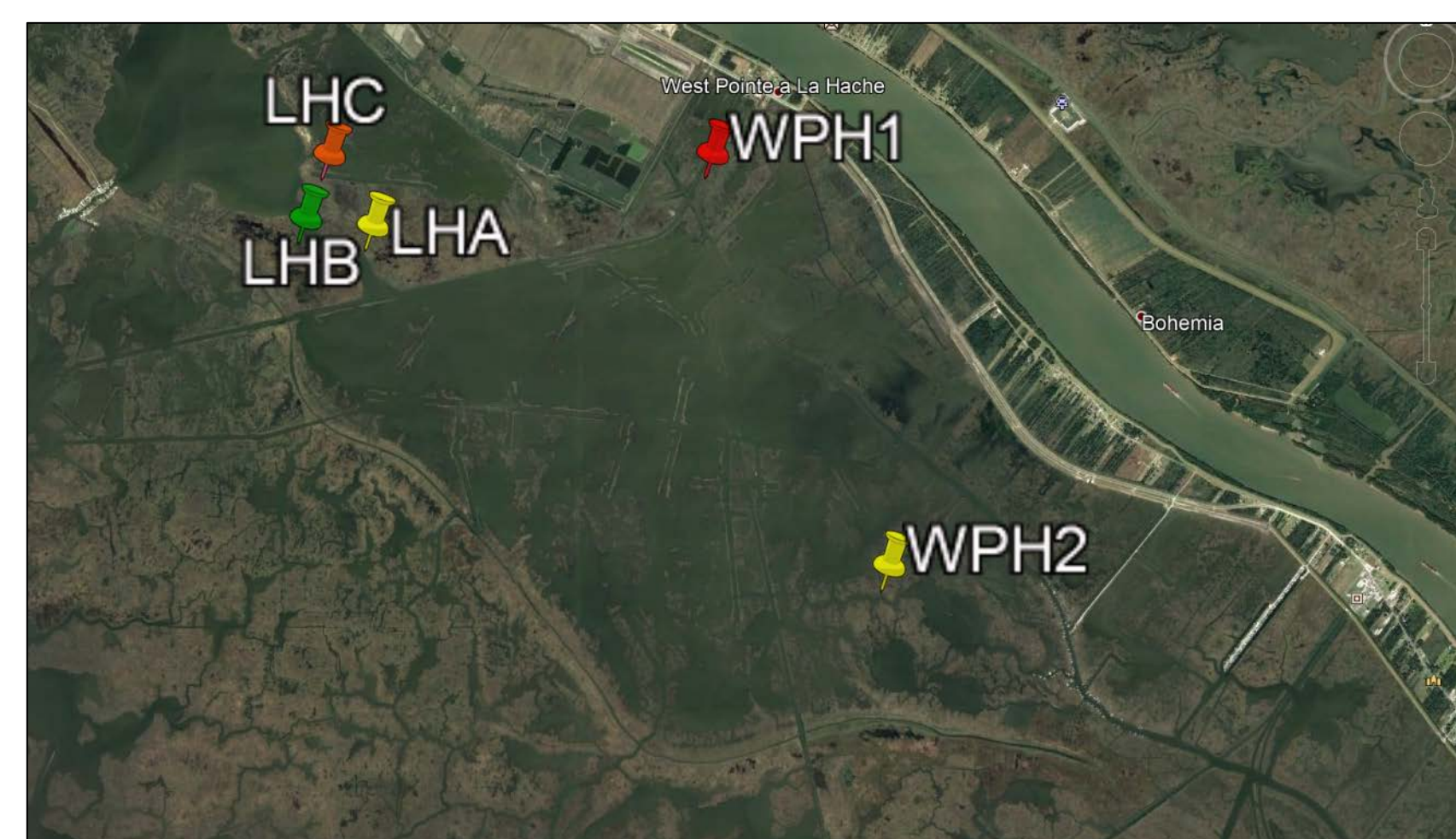


Fig. 2 - Study sites in Lake Hermitage and West Point a la Hache



Fig. 3 - Gulf Killifish collection

## Results

- Differences in Nitrogen values between age classes. ( $F_{1,222} = 79.7505, P < 0.0001$ )
- Natural Sites had higher Carbon values than created sites. ( $F_{4,222} = 31.1894, P < 0.0001$ )

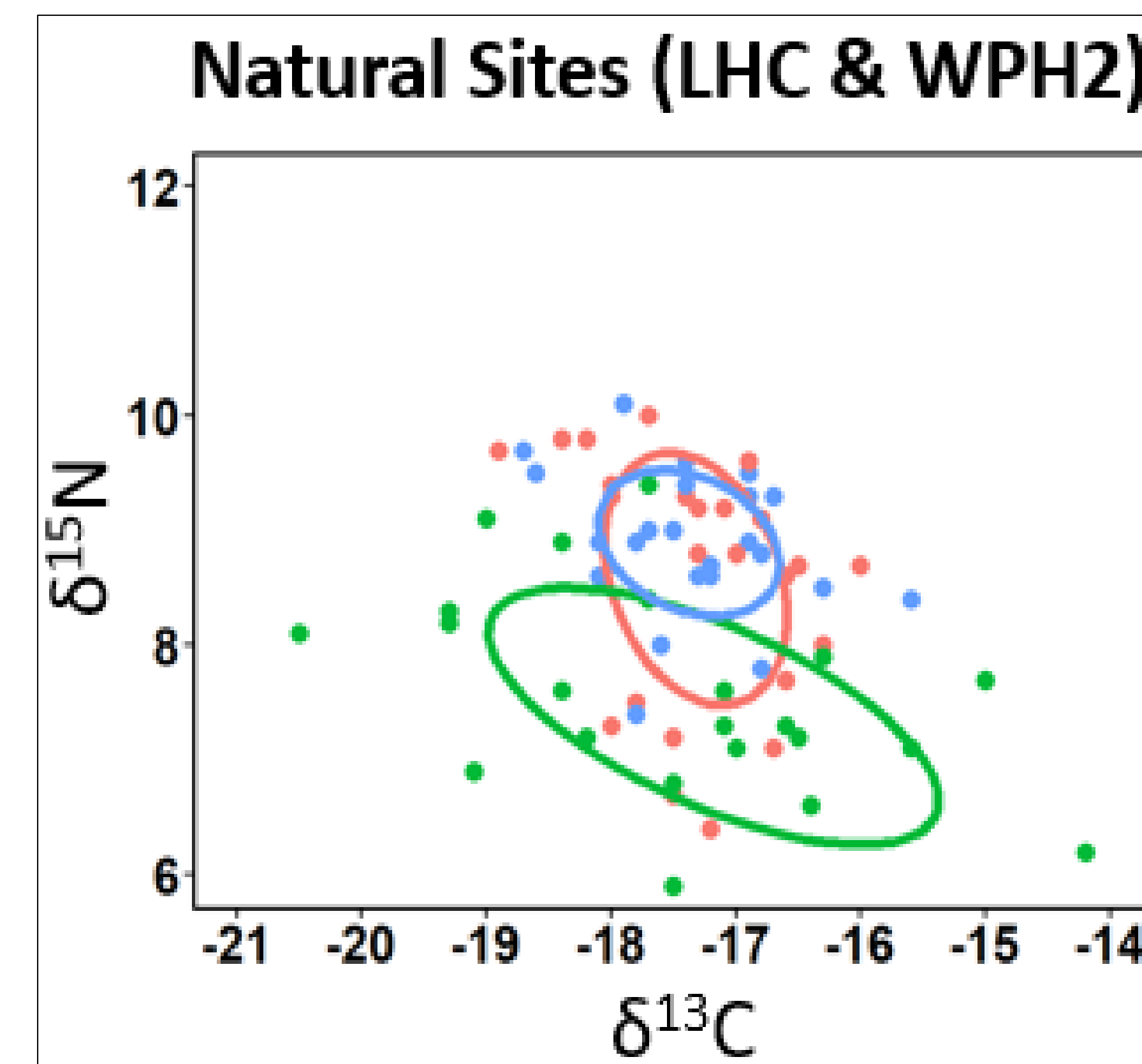


Fig. 1

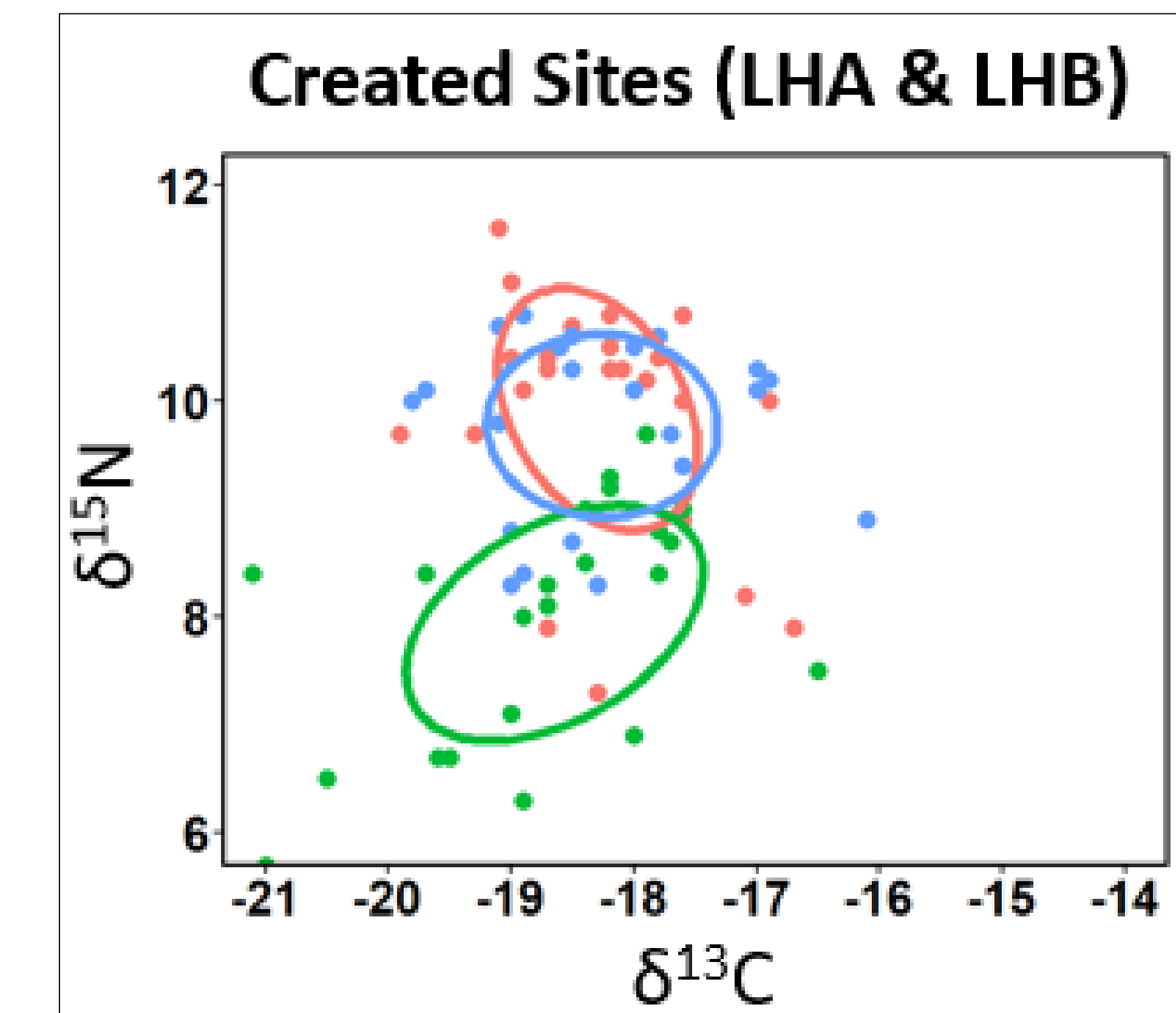


Fig. 2

Legend:  
■ Males  
■ Females  
■ Juveniles

- Juveniles have a lower trophic position than adults (fig. 3).
- Created sites have a higher ratio of aquatic to terrestrial basal carbon sources (fig. 4).

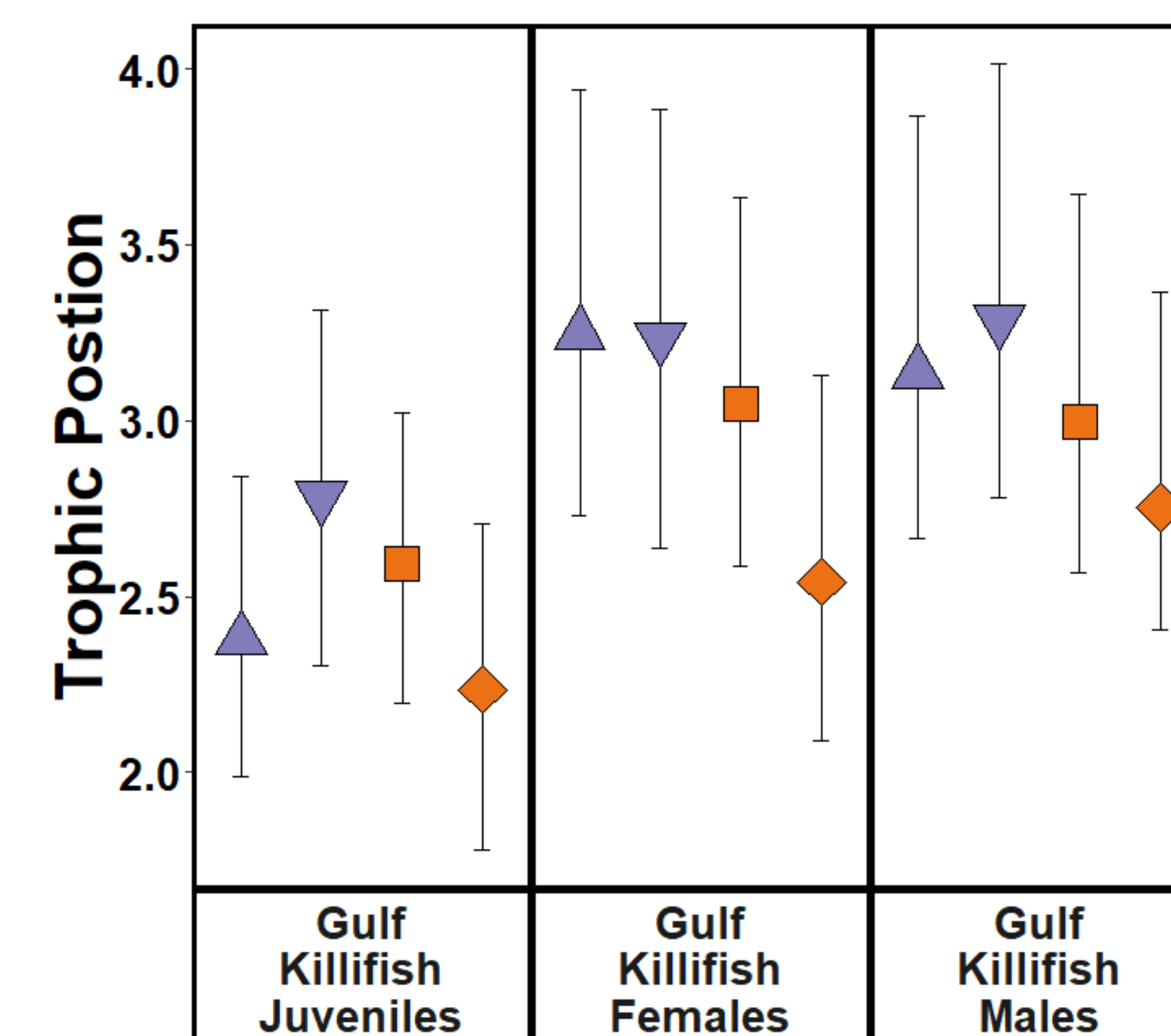


Fig. 3

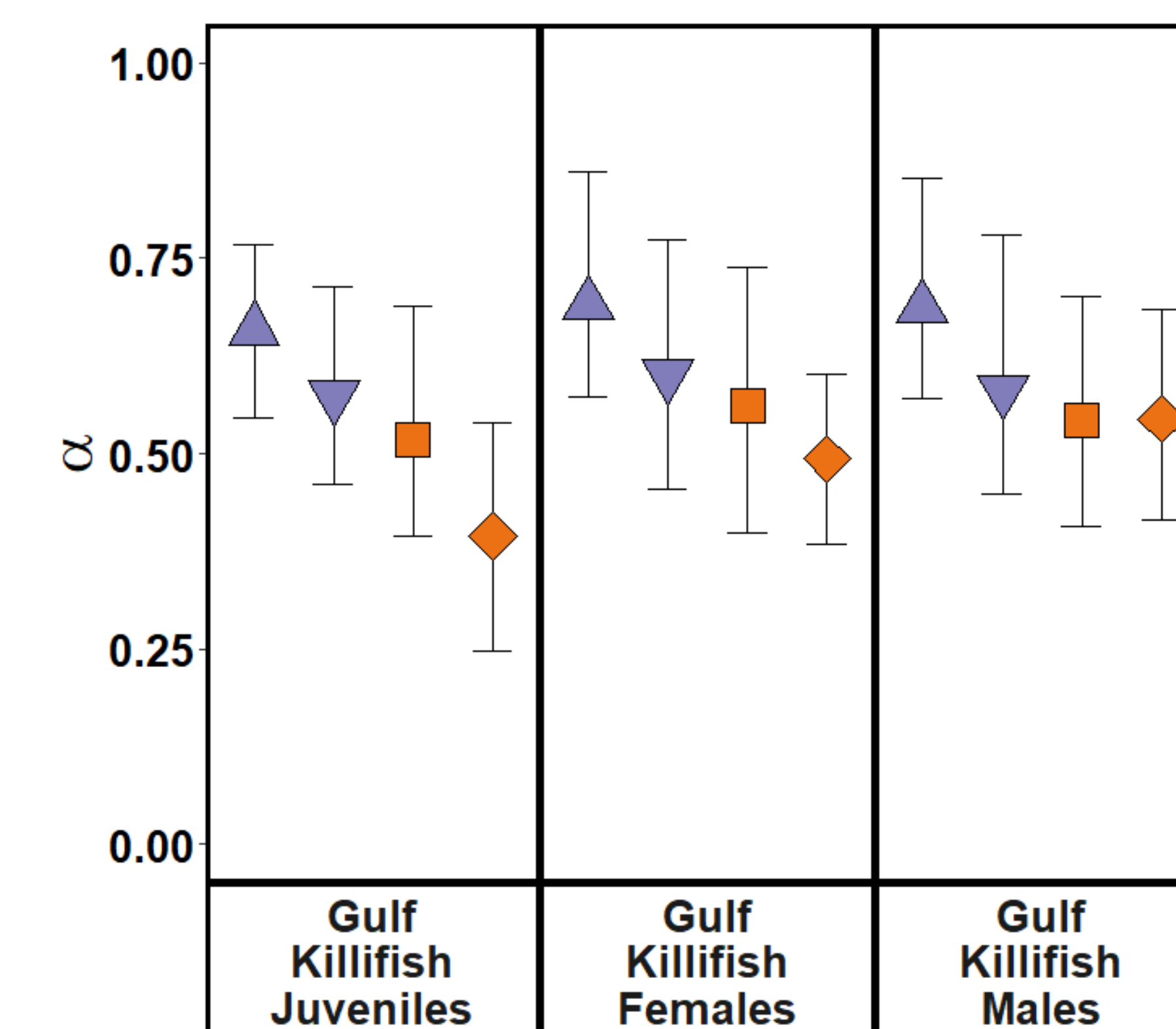


Fig. 4

## Conclusion

1. Gulf Killifish experience an increase in trophic position as they age.
2. Killifish at created sites had different basal carbon sources than Killifish at natural sites.