Potential Habitat and Diet Overlap Between Hybrid Striped Bass and Largemouth Bass on DeGray Lake, Arkansas: a Meta-analysis

Jeremiah Salinger and Steve Lochmann

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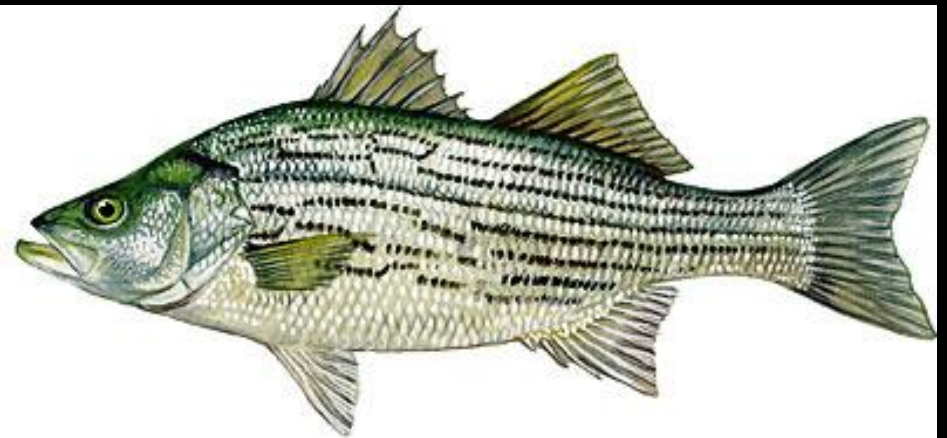

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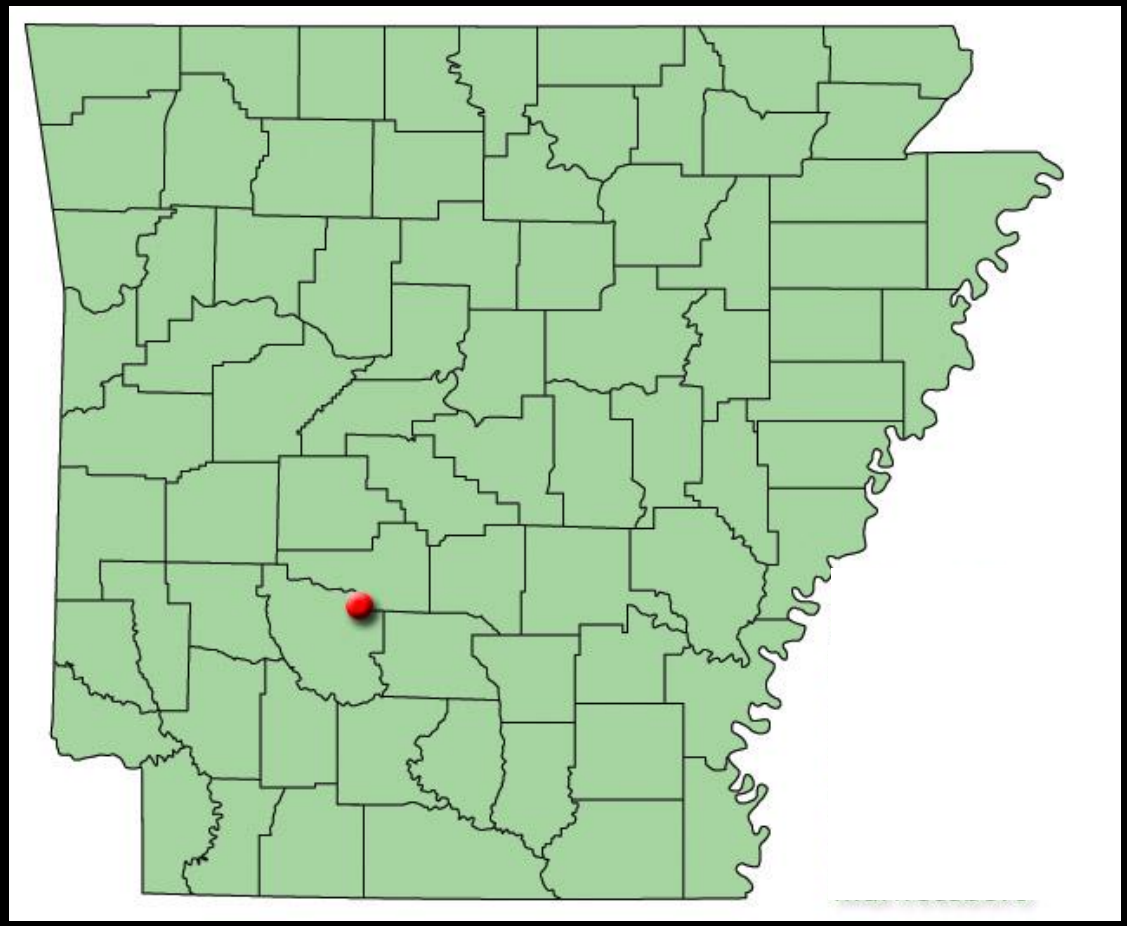
Introduction

- Hatchery fishes & reservoir fisheries
  - Non-native fishes
  - Temperate basses
  - Contribution to local economy
- Native/non-native interactions
  - Lack of study
  - Gilliland and Clady (1981), Kleinholz (1985)
- Precedent: Norris Reservoir (Raborn et al. 2002)

Introduction

- GOAL: Potential for resource competition in DeGray Lake?
- Objectives:
  - Seasonal habitat overlap
  - Seasonal diet overlap



Methodology

Literature Search Methods

- Literature databases
  - American Fisheries Society publications
  - State natural resource agencies
- Google Scholar
- Limitations
  - Adults
  - Reservoirs
  - Literature types

Data Analysis Methods

- Microsoft Excel
  - Data Analysis add-on
  - Summary statistics
- Resource overlap indices
  - Pianka's index (habitat data)
  - Schoener's index (diet data)

Methodology: Pianka's Index of Overlap

$$O_{kl} = \frac{\sum_i^n p_{il} p_{ik}}{\sqrt{\sum_i^n p_{il}^2 \sum_i^n p_{ik}^2}}$$

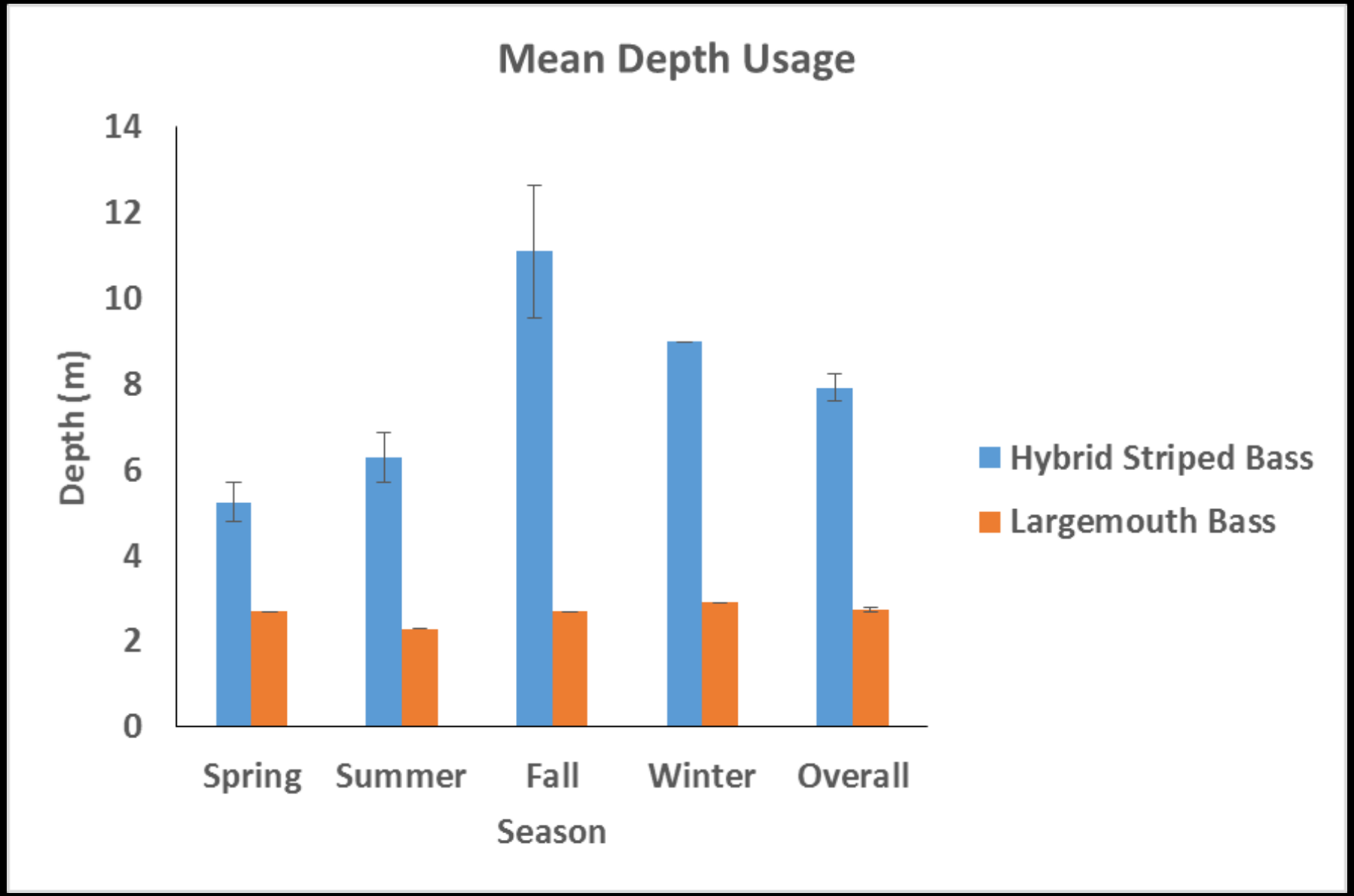
- **Where:**
  - O_{kl} = resource overlap between species *k* and *l*
  - p_{il} = the proportion of resource *i* used by species *l*
  - p_{ik} = the proportion of resource *i* used by species *k*

Methodology: Schoener's Index of Overlap

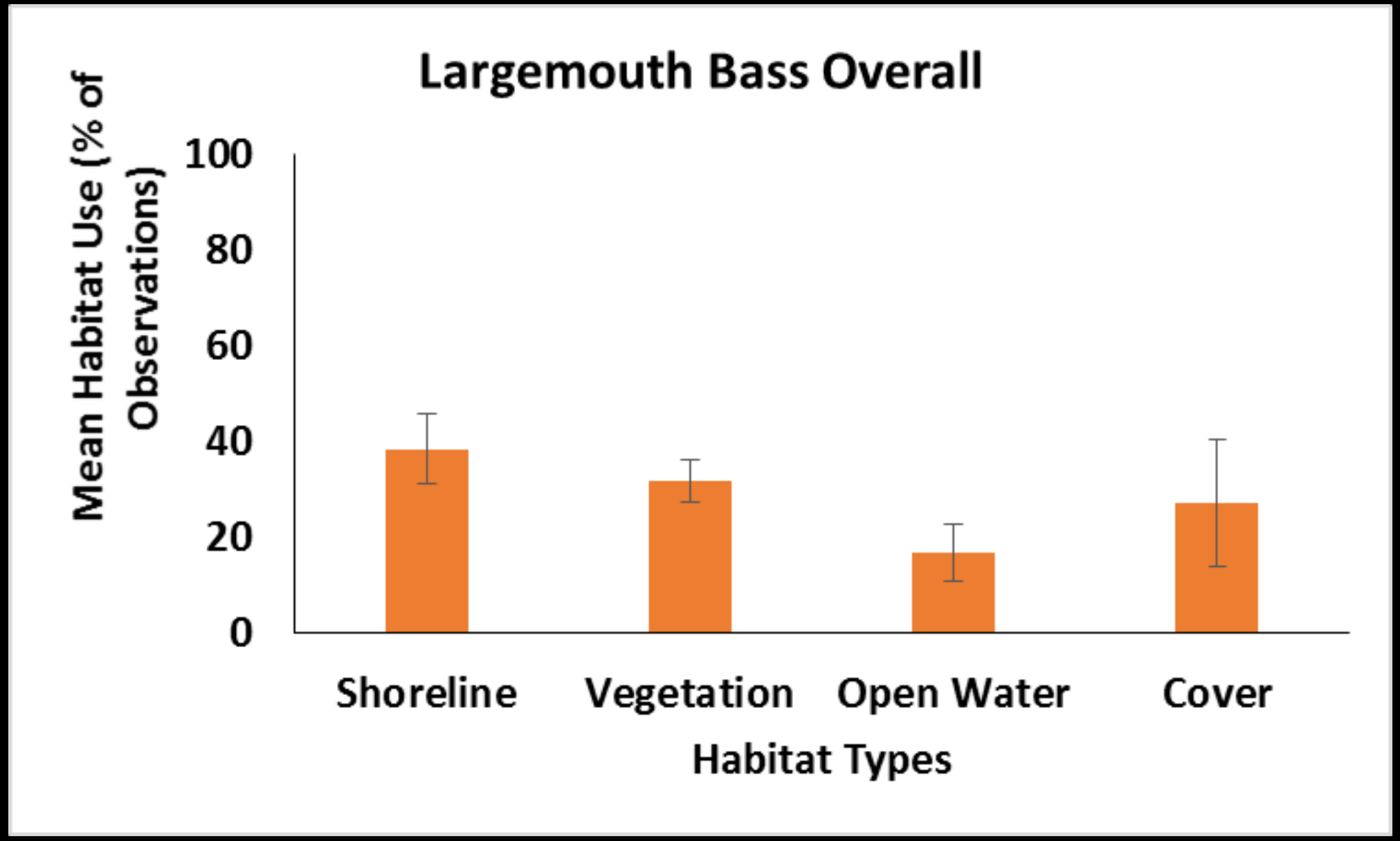
$$\boldsymbol{Percent\ overlap} = 100\left(1 - \frac{1}{2}\sum_{i}|\rho_{x,i} - \rho_{y,i}|\right)$$

- **Where:**
  - $\rho_{x,i}$ = the frequency at which species *x* consumes resource *i*
  - $\rho_{y,i}$ = the frequency at which species *y* consumes resource *i*

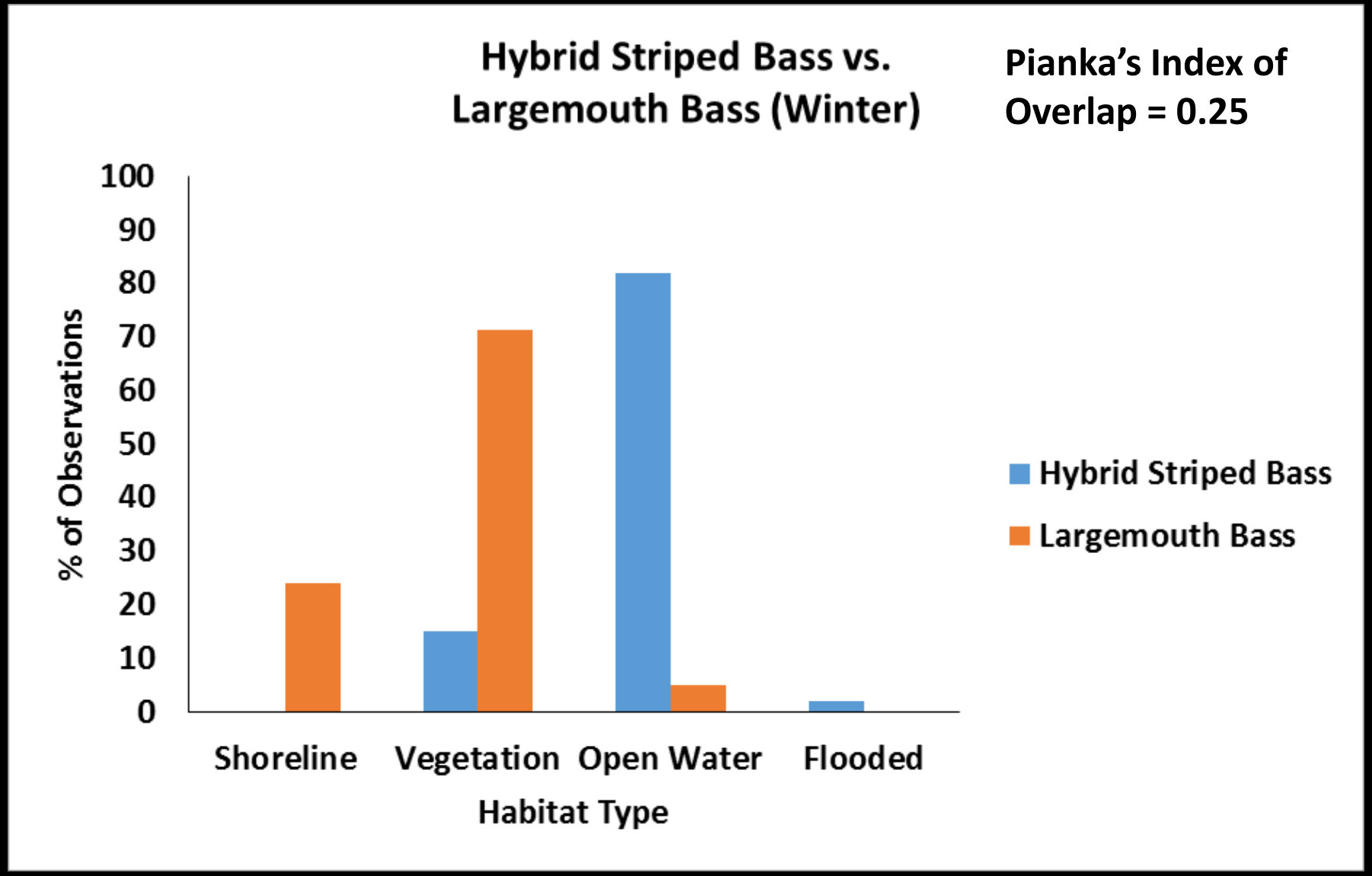
Habitat Usage



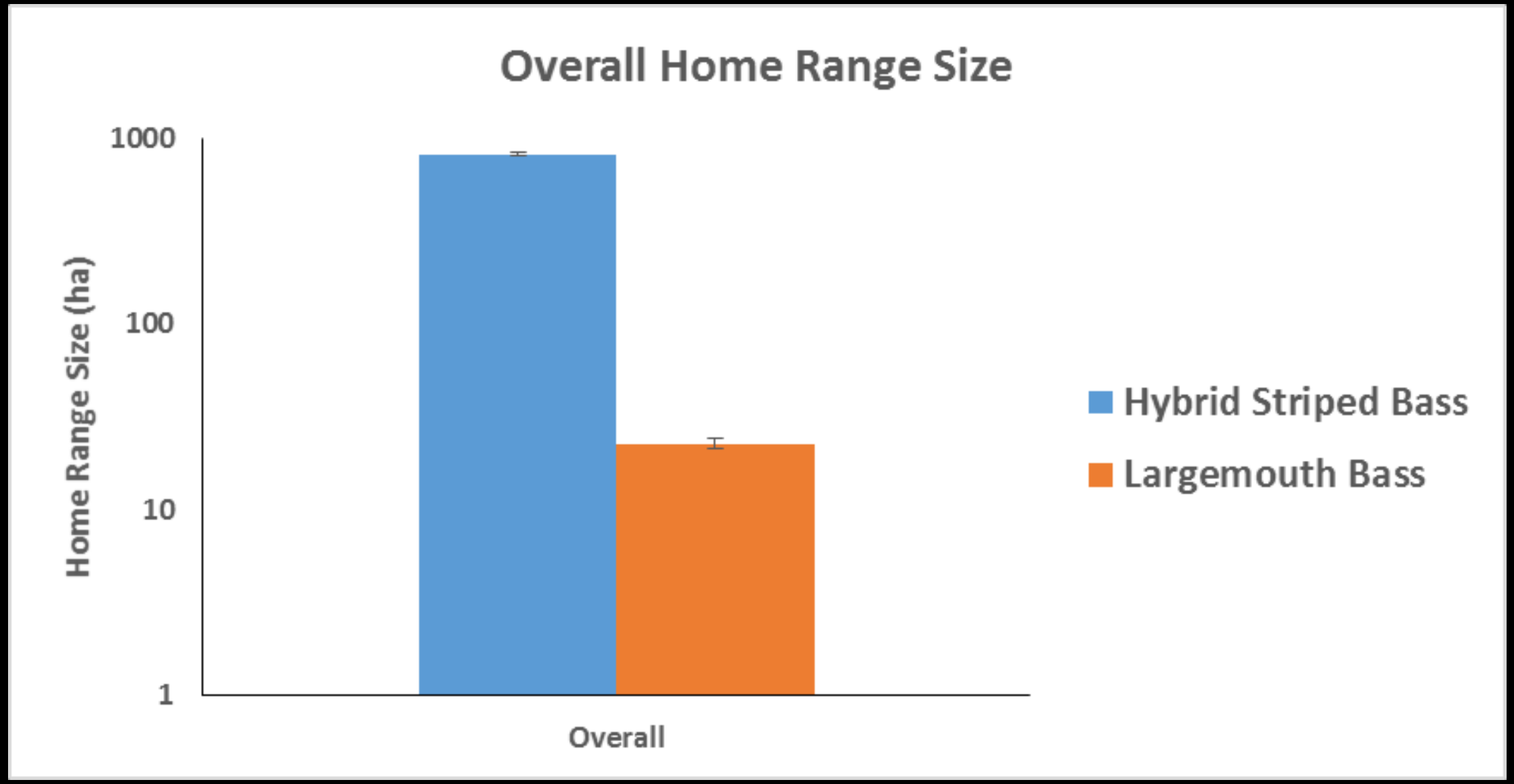
Habitat Usage



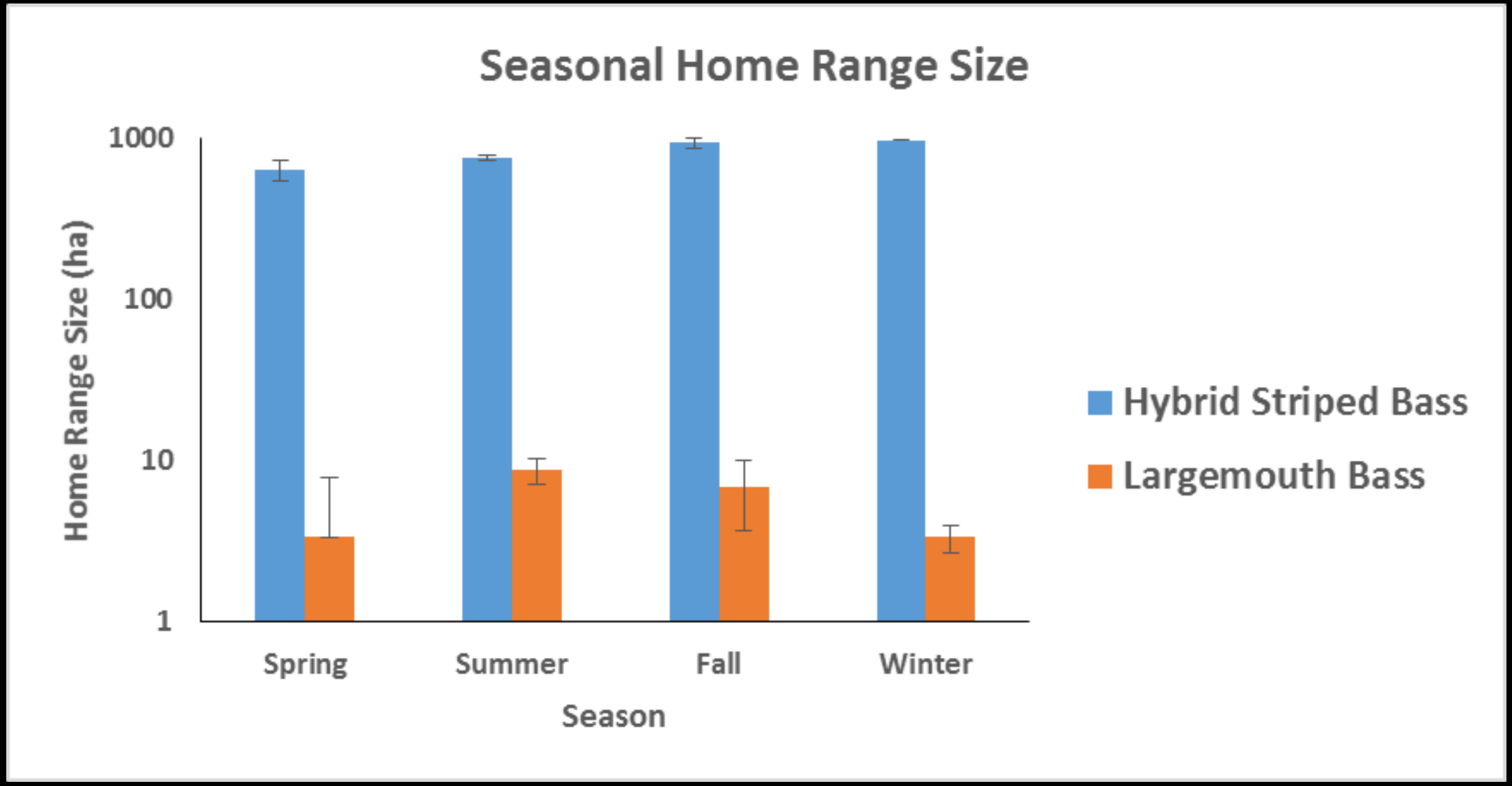
Habitat Usage



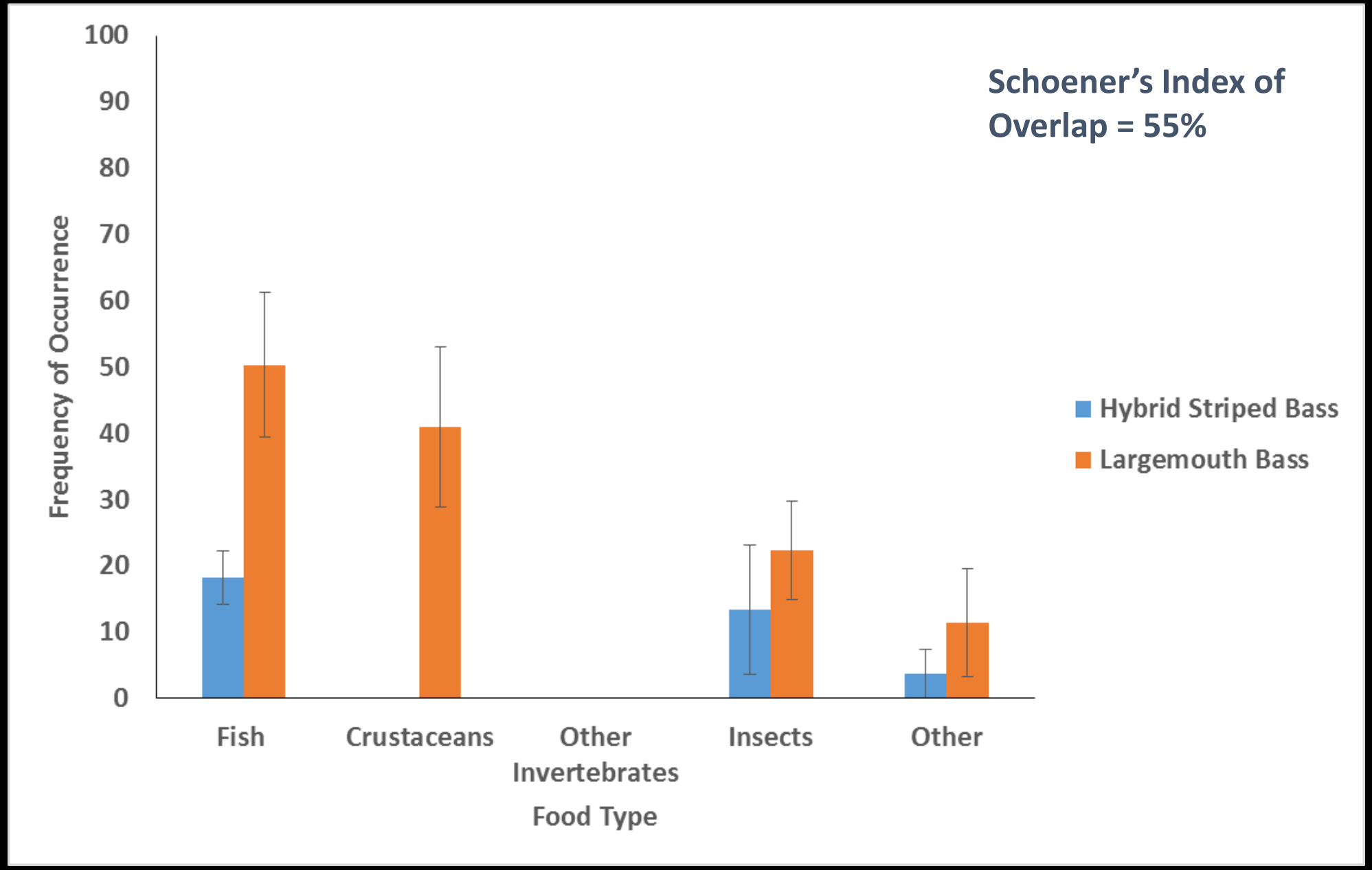
Habitat Usage



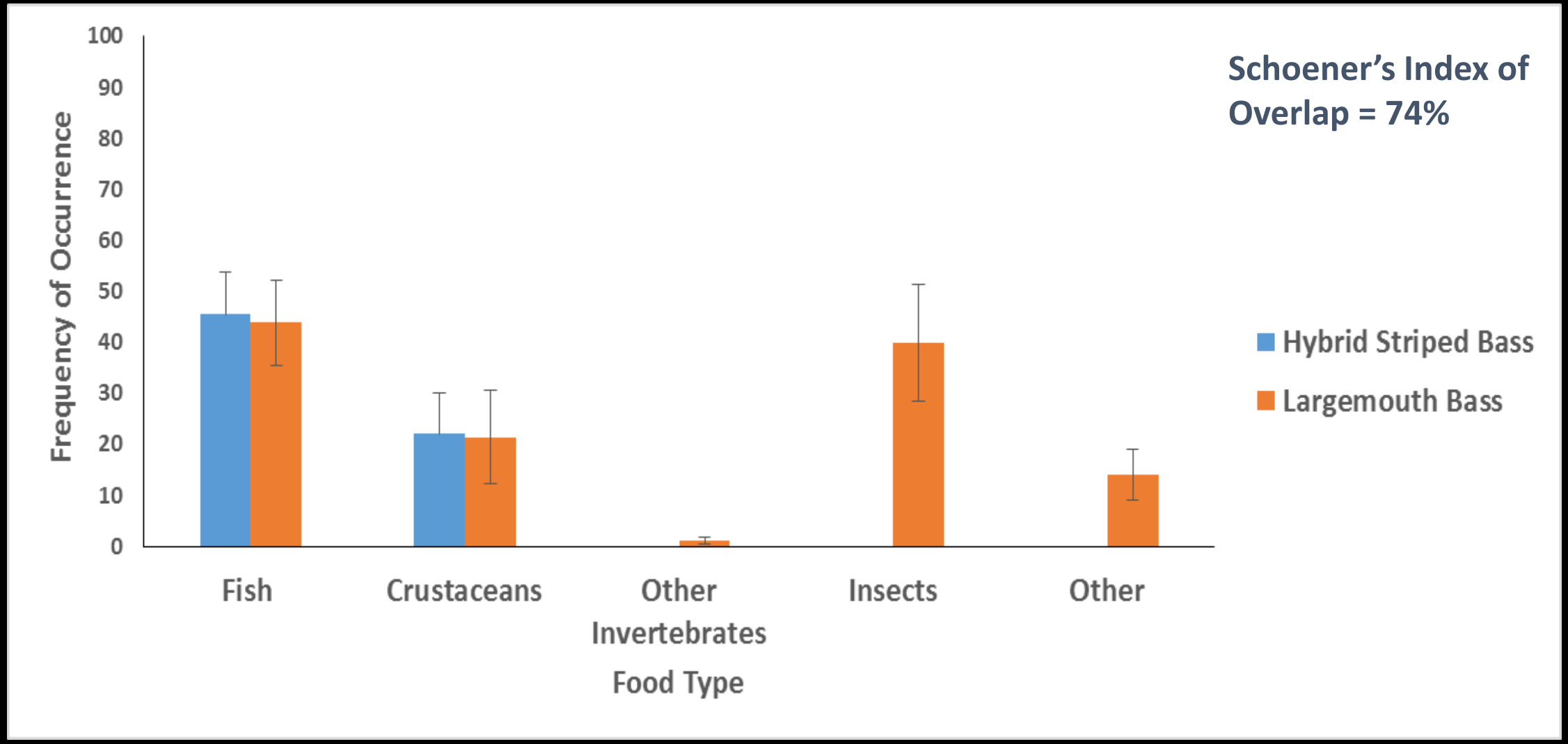
Habitat Usage



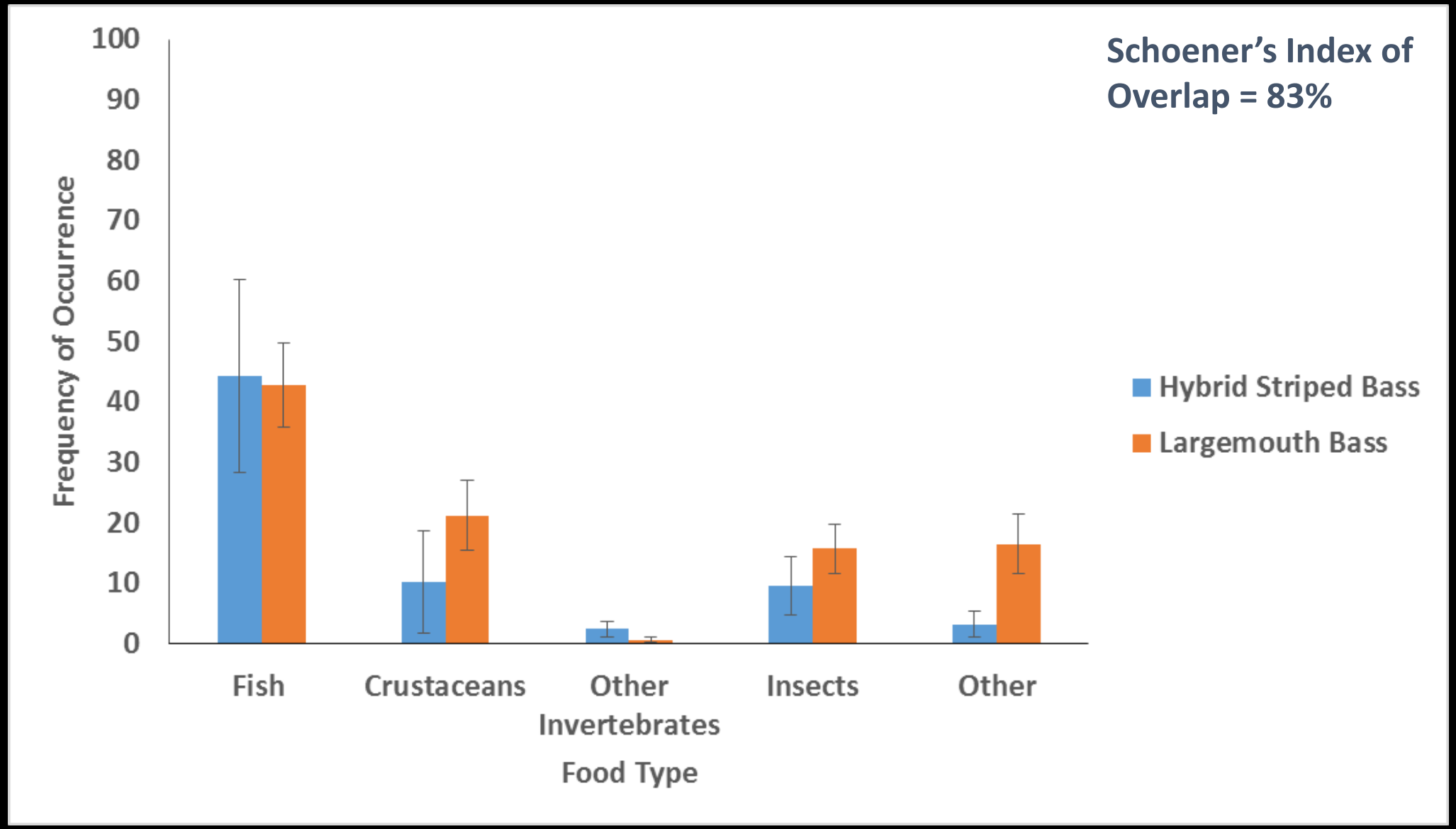
Diet Composition (Overall)



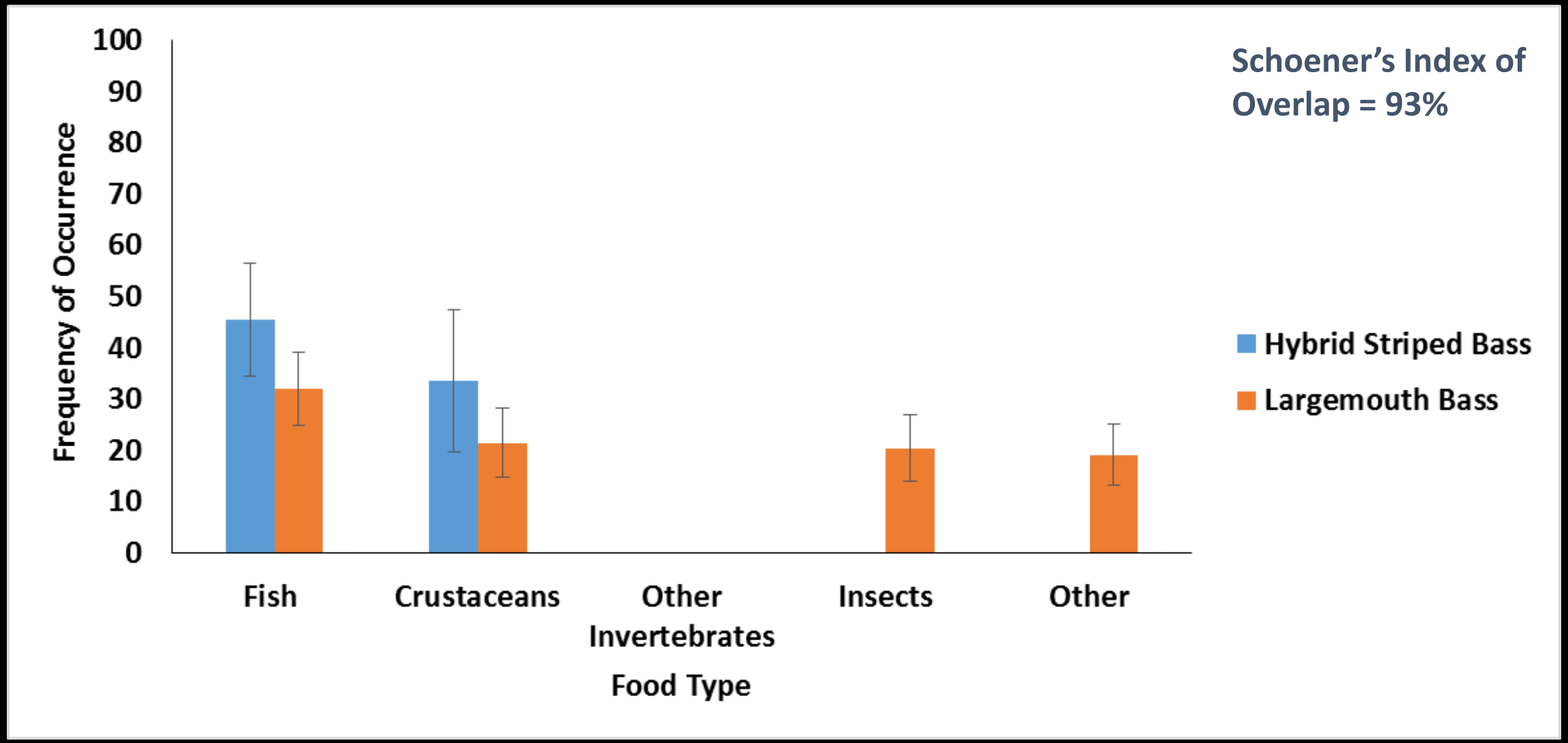
Diet Composition (Spring)



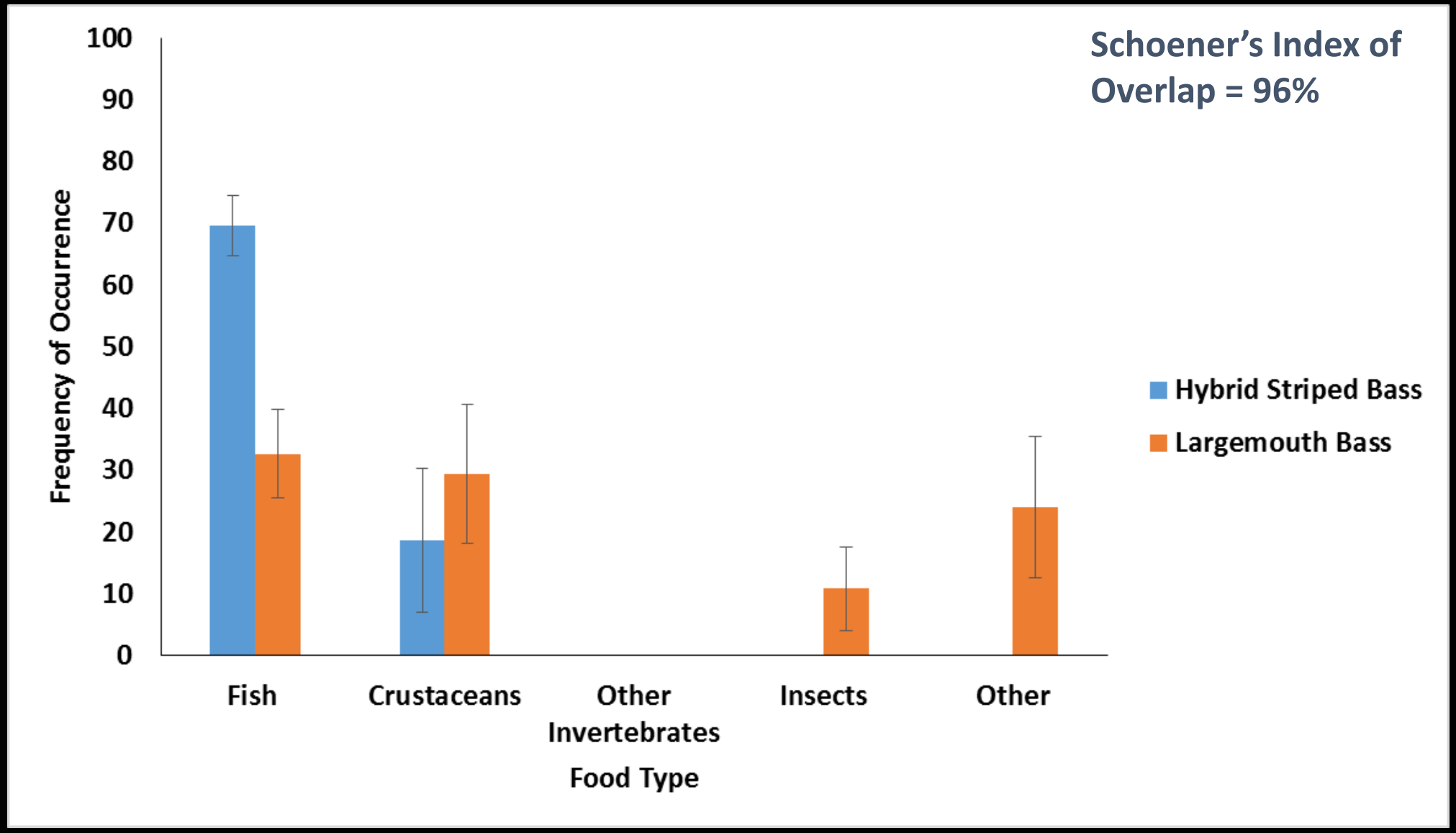
Diet Composition (Summer)



Diet Composition (Fall)



Diet Composition (Winter)



Take Home Message & Future Directions

- Habitat overlap potential
  - Depth/home range synergy
- Diet overlap potential (why?)
- Current research:
  - ➢2018 → Habitat use comparison
  - ➢2019 → Comparative diet analysis