

Invertebrate Biomass Effects on Abundance and Foraging Behavior of Dabbling Ducks



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Introduction

POI: How does invertebrate biomass affect the abundance and foraging behavior of different dabbling ducks?

Hypotheses:

1. Teal and Mallard abundance will be greater in areas with greater invertebrate biomass
2. Teal and Mallard foraging behavior will increase in areas with greater invertebrate biomass

Methods

Study Area:

The intertidal marsh section of the Arcata Marsh and Wildlife Refuge

- Point count surveys were performed using binoculars and spotting scope for bird counts
 - 10 minuets
 - **Recorded:**
 - Abundance of Mallard and Teal
 - Total number of individuals foraging vs not foraging
 - Foraging Behavior recording using 0-1 sampling
- Invertebrate Sampling was done using a benthic corer and invertebrate sampling was done after every point count survey
 - 4 locations, one location would be at flock location, the other three were random
 - A core sample would be taken one meter in each cardinal direction(N, S, E, W).
 - Invertebrates were dried and weighed

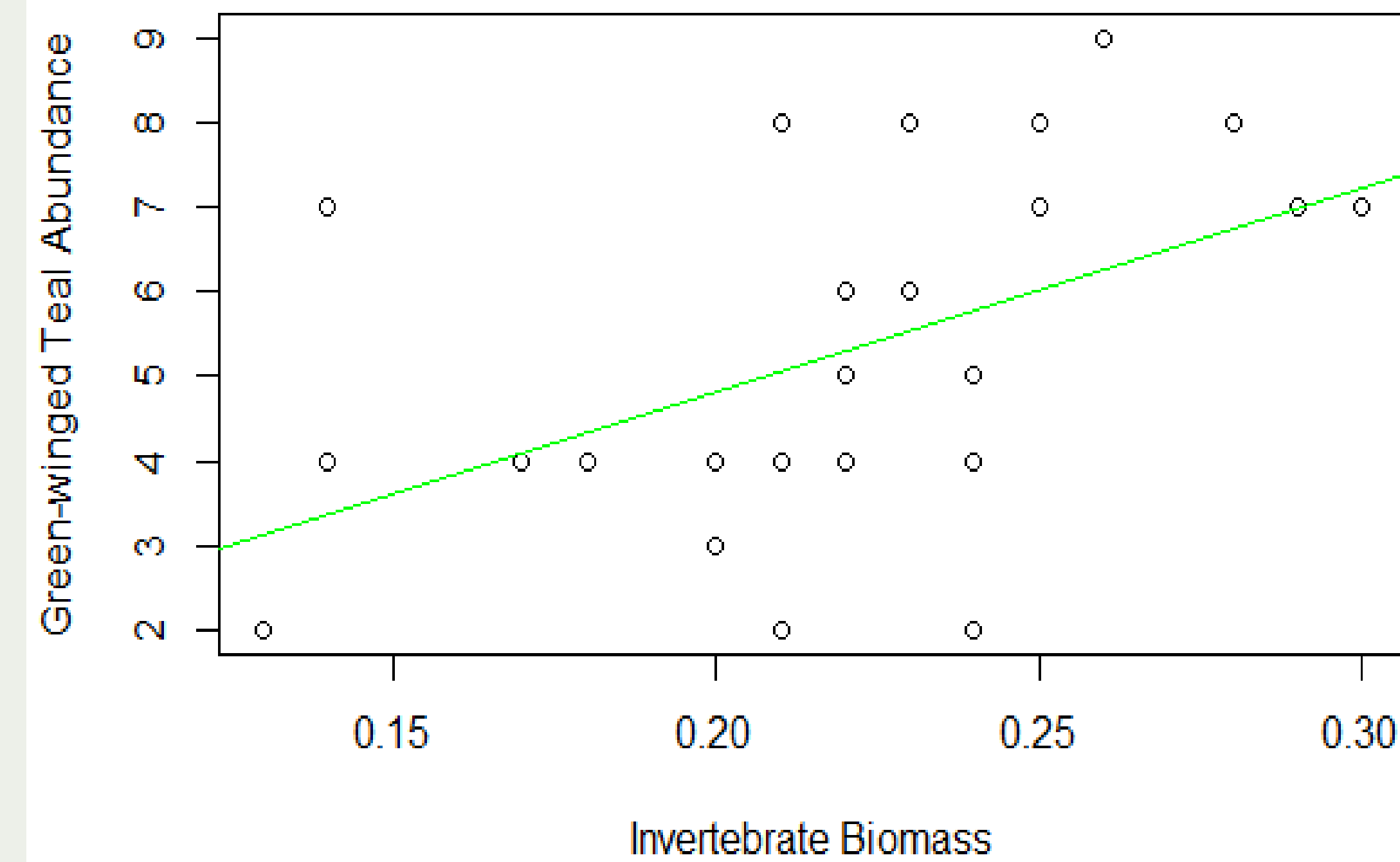


Fig 1. Green-winged Teal abundance as a function of invertebrate biomass

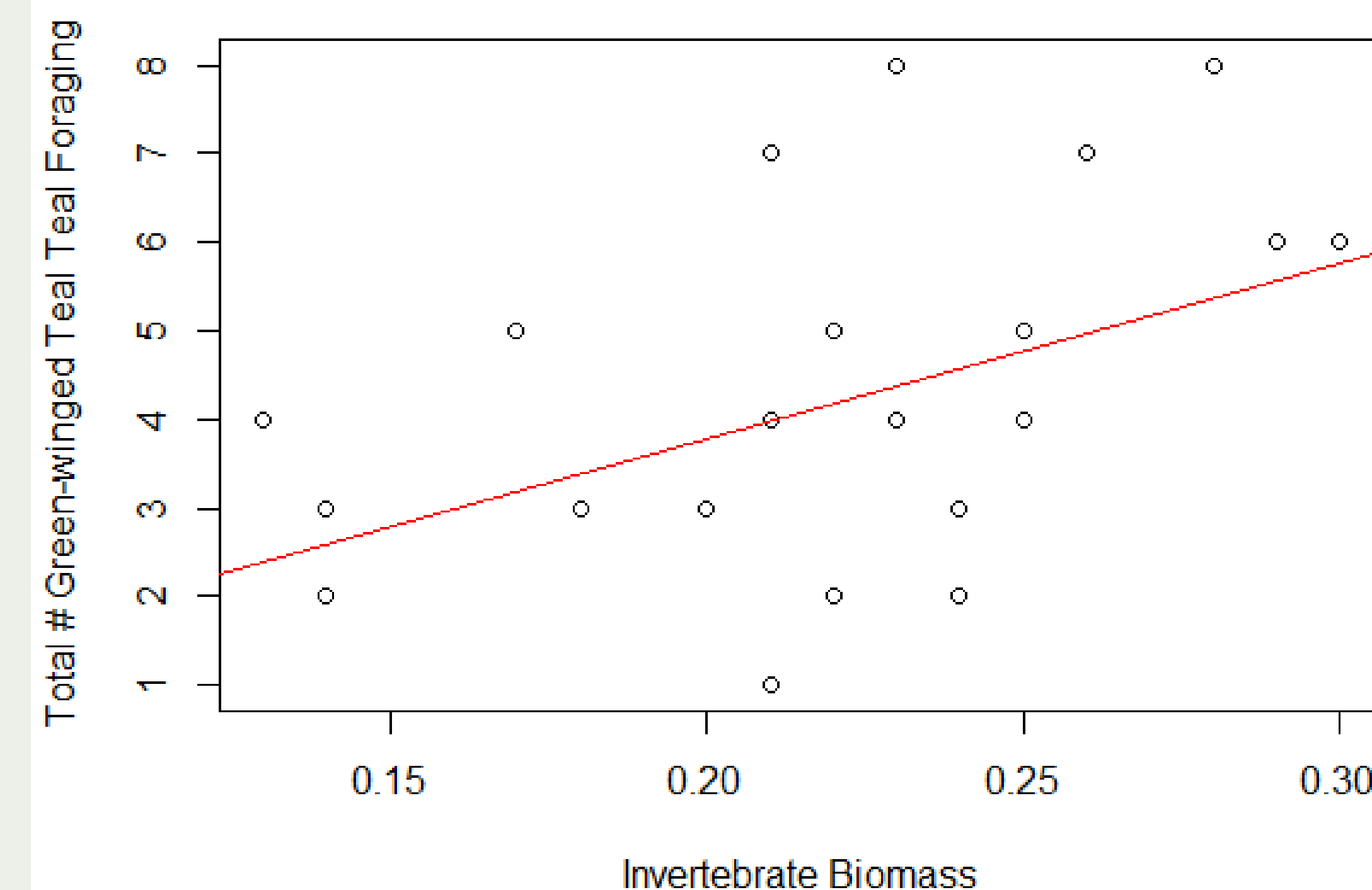


Fig 2. AGWT foraging behavior as a function of invertebrate biomass

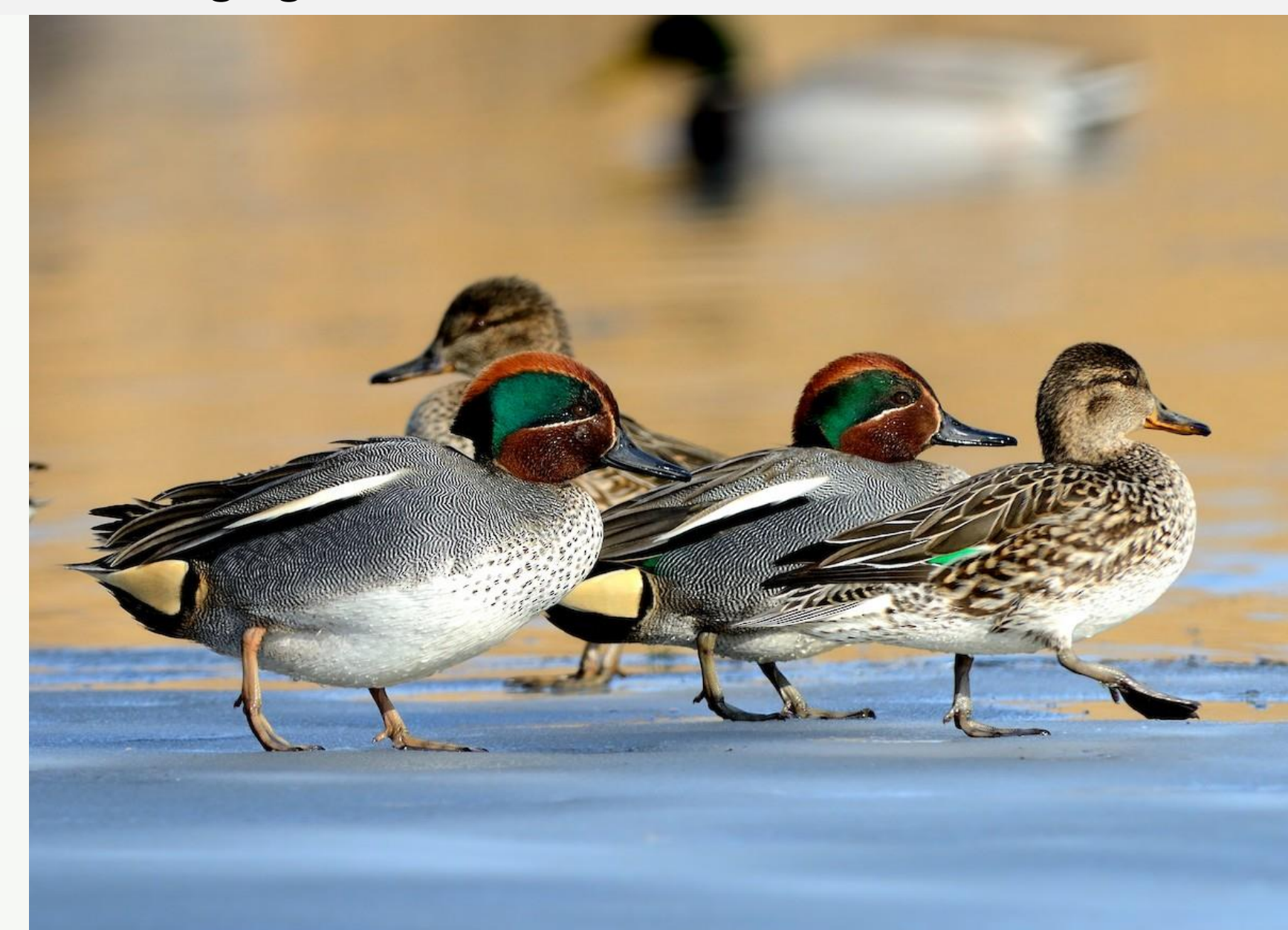


Photo Credit: Jihomoravský kraj, Czech Republic 2018

Acknowledgments

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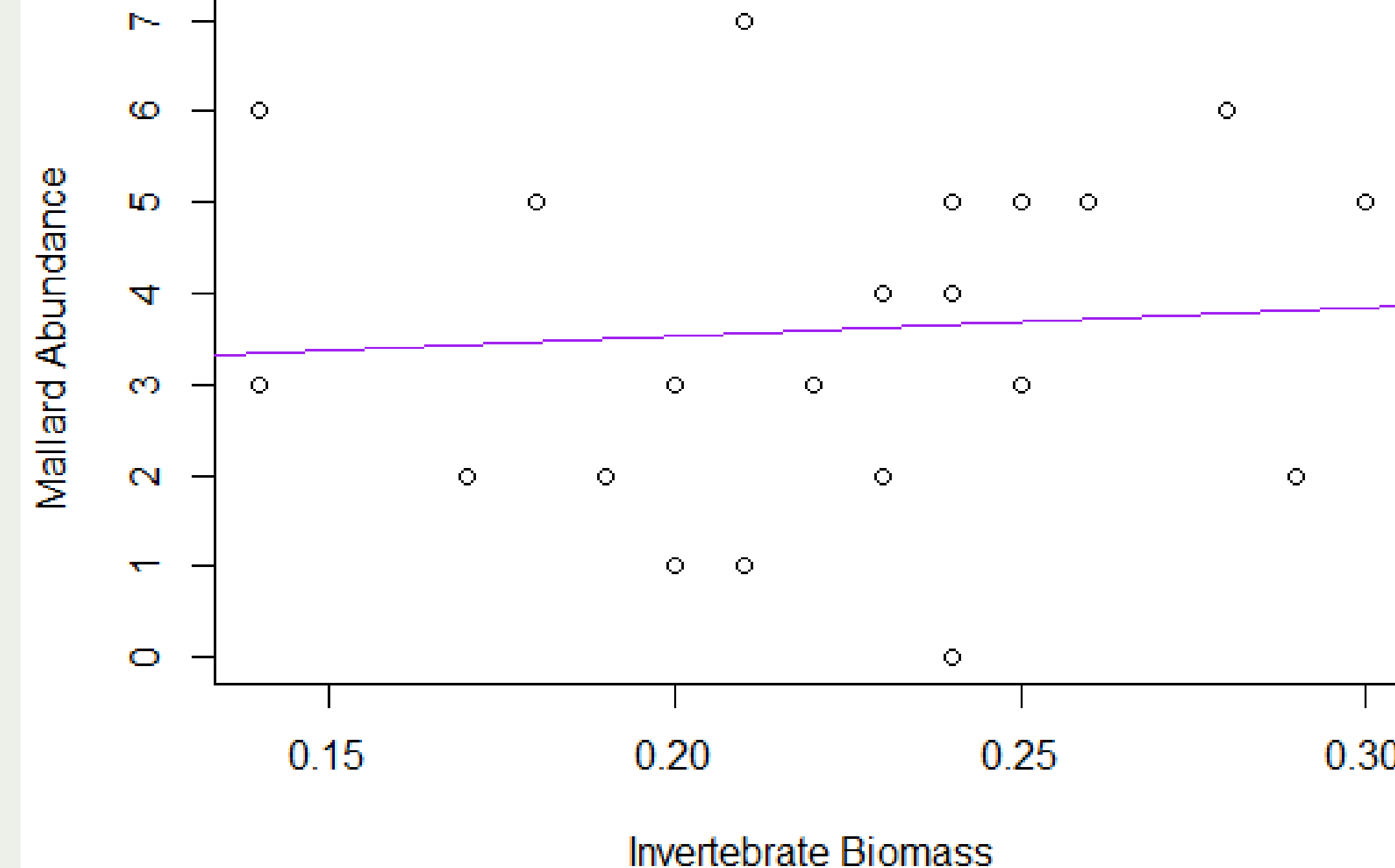


Fig 3. Mallard abundance as a function of invertebrate biomass

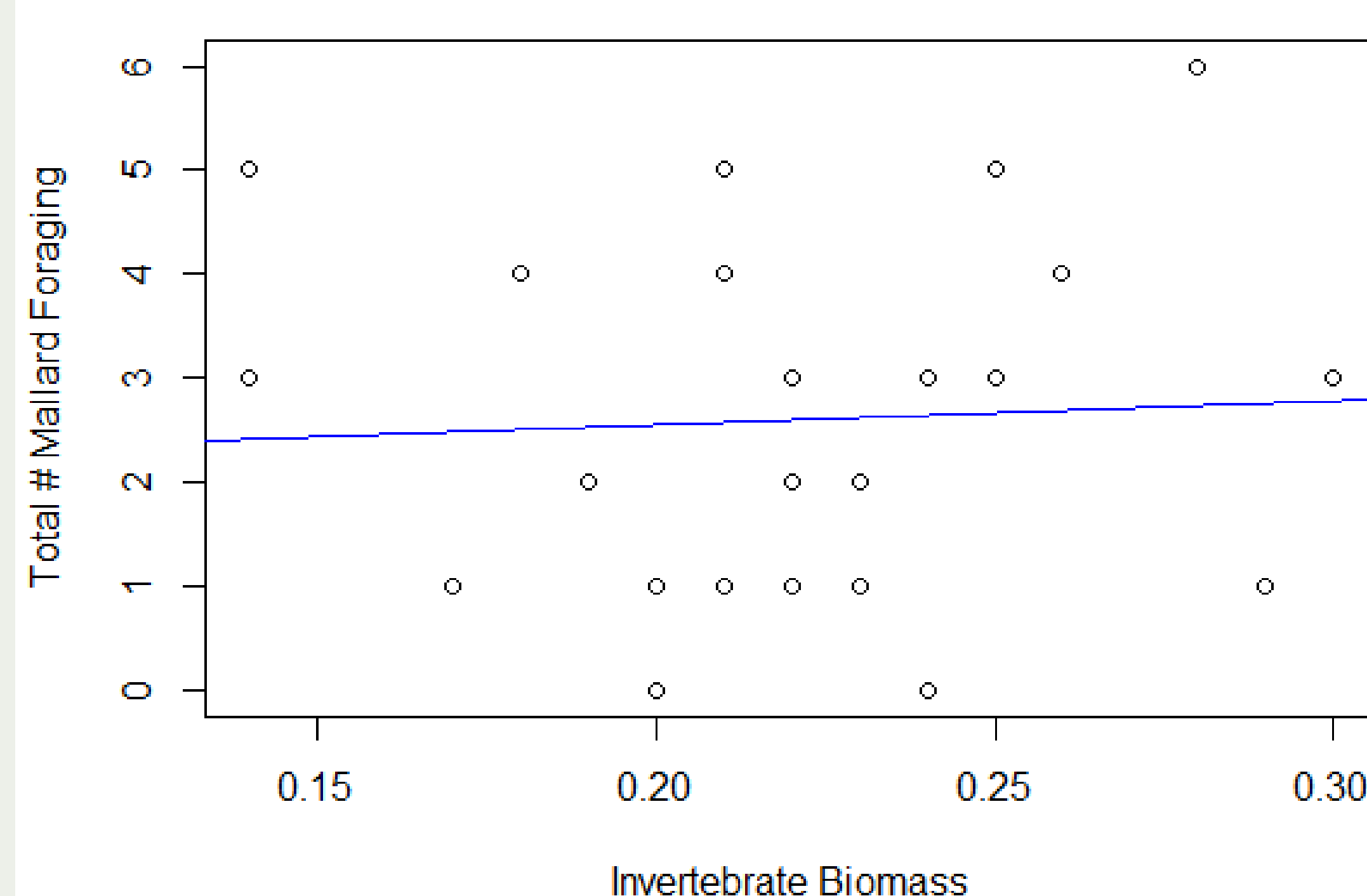


Fig 4. Mallard foraging behavior as a function of invertebrate biomass

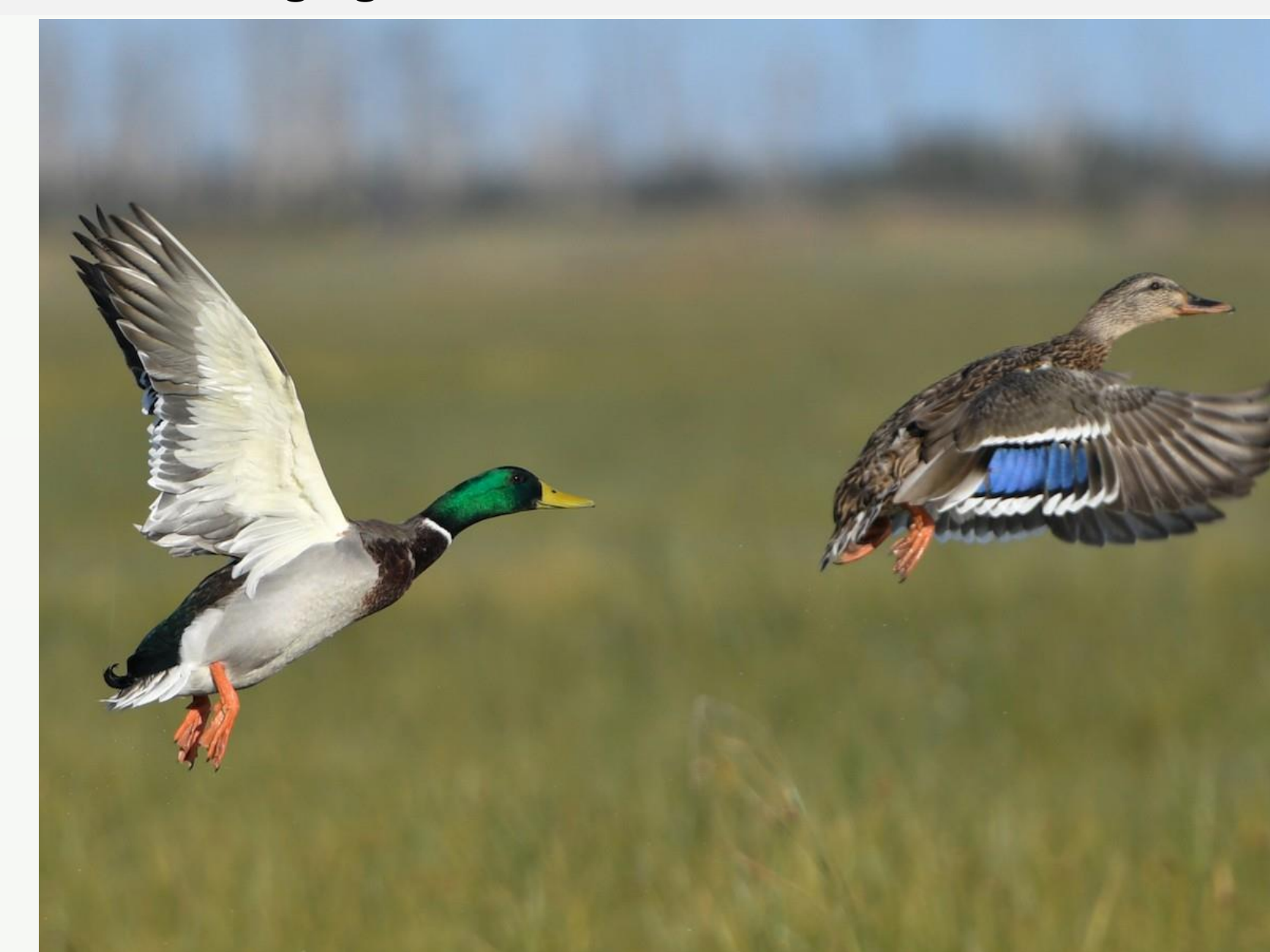


Photo Credit: Jonathan Irons, Virginia, United States 2019

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Results

Measured Variables	P-value
AGWT Abundance ~ Invertebrate Biomass	0.0110
AGWT Foraging Behavior ~ Invertebrate Biomass	0.0309
Mallard Abundance ~ Invertebrate Biomass	0.5901
Mallard Foraging Behavior ~ Invertebrate Biomass	0.7389

Discussion

- Results show a statistically significant relationship between invertebrate biomass and GWT abundance and foraging behavior.
 - **not for Mallard**
- Proper permits were not obtained until March 2023, halfway through the field season.
 - Assumptions were made about the invertebrate biomass at flock locations for surveys where invertebrate sampling could not occur
 - **This may have influenced the results of the statistical analysis**

Management Implications

Given the results of this study, I would suggest that managers and conservationists managing Green-winged Teal populations manage habitat for healthy invertebrate populations.