

Cal Poly Humboldt

Digital Commons @ Cal Poly Humboldt

IdeaFest 2023

2023

Examining the Relationship between Zooplankton Abundance and Iscivorous Bird Richness at the Arcata Marsh

Aminah Aryan

Cal Poly Humboldt, aa786@humboldt.edu

Follow this and additional works at: <https://digitalcommons.humboldt.edu/ideafest2023>

Recommended Citation

Aryan, Aminah, "Examining the Relationship between Zooplankton Abundance and Iscivorous Bird Richness at the Arcata Marsh" (2023). *IdeaFest 2023*. 93.

<https://digitalcommons.humboldt.edu/ideafest2023/93>

This Article is brought to you for free and open access by Digital Commons @ Cal Poly Humboldt. It has been accepted for inclusion in IdeaFest 2023 by an authorized administrator of Digital Commons @ Cal Poly Humboldt. For more information, please contact kyle.morgan@humboldt.edu.

Examining the relationship between zooplankton abundance and piscivorous bird richness at the Arcata Marsh

H.

Aminah Aryan

Cal Poly Humboldt - Senior Thesis - Spring 2023

H.

Introduction

- Examined the relationship between zooplankton abundance and piscivorous bird richness at the Arcata Marsh
- Food web dynamics (Vander Zanden and Vadeboncoeur 2002)
- **Hypothesis:** An increase in zooplankton abundance will lead to an increase in the population of piscivorous birds

Methods

- 12 time-constrained (20 minutes) perimeter walks per body of water (3 bodies total, 36 perimeter walks)

To compare zooplankton and bird richness:

- 10x24 binoculars; direct observations/point counts
- Plankton tow used to collect zooplankton
- Zooplankton counted under microscope using 100/Species method (Mack et al. 2012)
- A poisson regression model was run to test for a relationship between zooplankton abundance and bird richness

Results

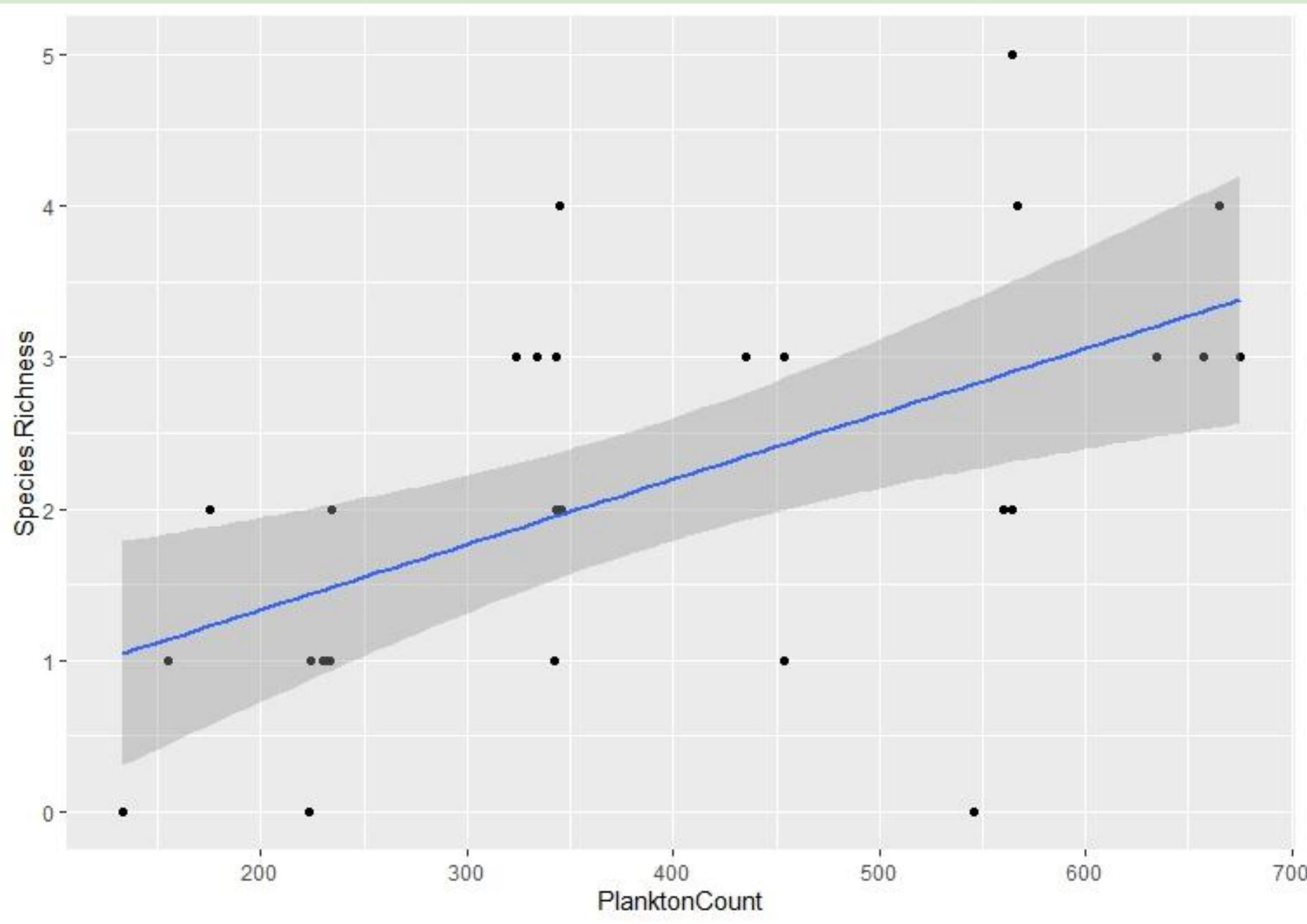


Figure 1. Total species richness counts plotted against zooplankton abundance across all study sites within the Arcata Marsh (Feb - April 2023).

Sites	Average Plankton Count	Average Species Richness
Brackish Pond	350	2.6
Klopp Lake	588.6	2.7
West Pond	218.3	1.1
Total	385.6333333	2.133333333

Table 1. Table of the average plankton count and species richness at each site (Feb - April 2023). *By City of Arcata*

Images



Figure 3. Microscopic image of zooplankton abundance, showing the variety of species and morphology present in the community. (Feb - April 2023). *By Illinois River Biological Station*

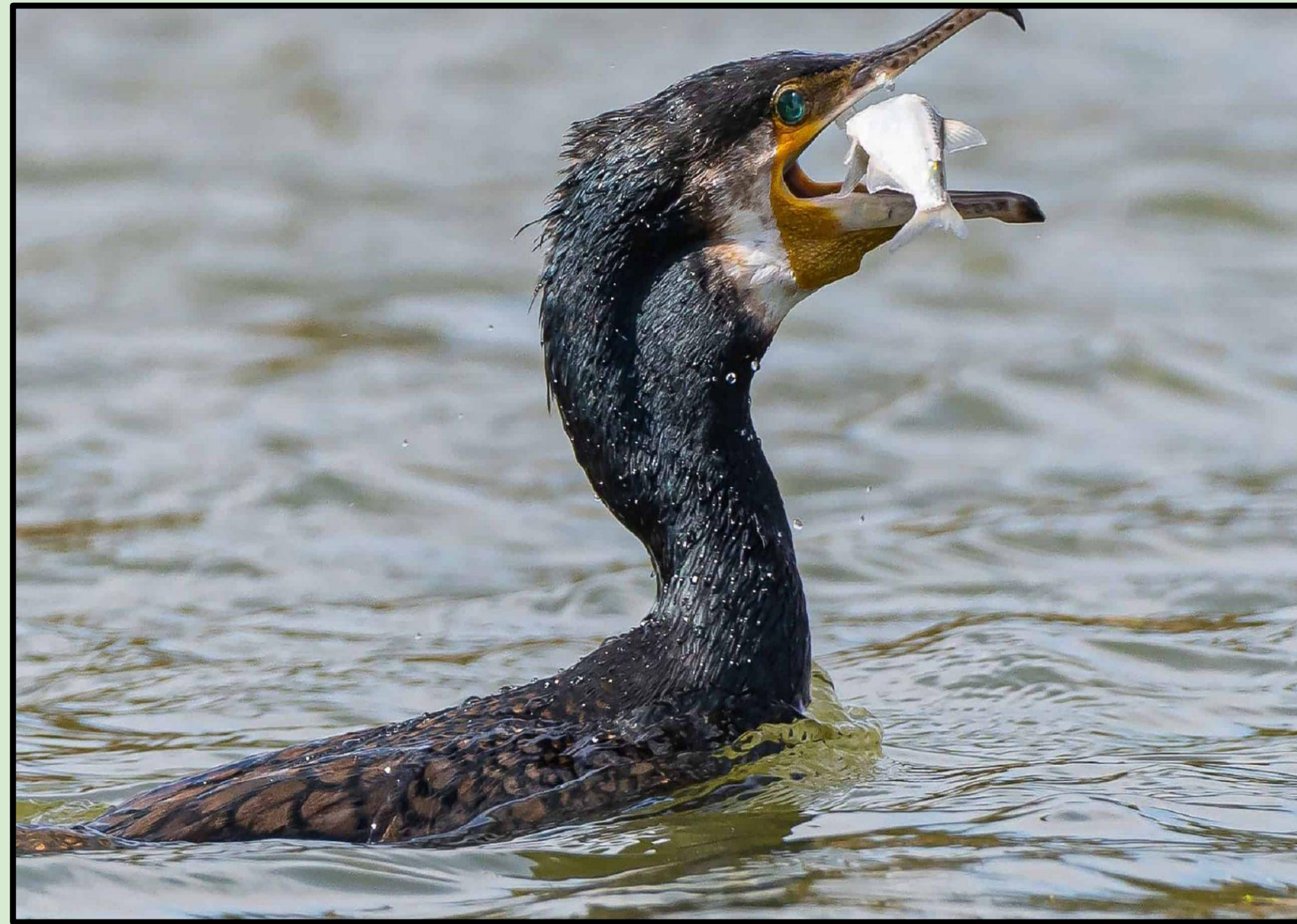


Figure 4. Piscivorous bird species include cormorants, blue herons, snowy egrets and more (Žydelis and Kontautas 2008). *By National Audobon Society*

Discussion

- Significant correlation ($p=0.008$) between zooplankton abundance and piscivorous bird richness in the three different ponds studied.
- Improvements:
 - Predictor variables
 - Expand sample size
 - Temporal variability



Literature Cited

- Mack, H. R., J. Conroy, K. Blocksom, R. Stein, and S. Ludsin. 1970. A comparative analysis of zooplankton field collection and sample enumeration methods. *Limnology and Oceanography* 10:41-53.
- Vander Zanden, M. J., & Vadeboncoeur, Y. 2002. Fishes as integrators of benthic and pelagic food webs in lakes. *Ecology* 83:2152-2161.
- Žydelis, R., and A. Kontautas. 2008. Piscivorous birds as top predators and fishery competitors in the lagoon ecosystem. *Hydrobiologia* 611: 45-54.

Acknowledgements

Thank you to: The **birds**, **Cal Poly Humboldt**, and Professor **David Sinn** (and **Link!**)