1 Group Name

Florida Alligator Food Choice

2 Group Member

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3 Topic

Alligator Food Choice

4 Background and Literature Review

Understanding the dietary habits of alligators is pivotal for ecological balance and conservation strategies. Alligators, as apex predators, play an essential role in their ecosystems, influencing prey populations and nutrient distribution. Their diet, influenced by a range of factors including habitat, biological traits, and prey availability, provides insights into their ecological roles and adaptability to environmental changes. This project aims to investigate the dietary patterns of alligators across different Florida lakes, exploring how factors such as location, gender, and size impact their primary food choices.

The motivation for this study arises from the necessity to enhance our understanding of alligator behavior and its implications for ecosystem health. Knowledge of how various factors affect alligator food choices can inform conservation efforts, guide the management of alligator populations, and help predict the effects of environmental shifts on these key predators. This research not only contributes to our ecological knowledge but also aids in developing strategies to preserve the delicate balance within aquatic ecosystems.

The dietary patterns and conditions of American alligators (Alligator mississippiensis) have been the focus of extensive research due to their pivotal role in maintaining the ecological balance within their habitats. Studies by Delany et al. [2] and Delany and Abercrombie [1] have laid the groundwork in understanding the complex interplay between alligator size, gender, and their preferred prey, unveiling how these factors dictate the diet composition across various Floridian lakes. These foundational works not only highlight the dietary shift from invertebrates to larger vertebrates as alligators grow but also emphasize the significance of habitat characteristics in influencing these patterns.

Further contributions by Rice [4] provide a closer examination of the dietary preferences and physical conditions of adult alligators in central Florida, identifying a strong preference for fish and noting considerable variances in dietary habits across different lake environments. This research underscores the importance of prey availability and habitat diversity in shaping the feeding behavior and overall health of alligators. On the other hand, the study by Platt et al. [3] focuses on the lesser-studied juvenile stage of alligators, exploring how the unique estuarine ecosystems of the Upper Lake Pontchartrain influence the diet of young alligators. Their findings reveal a reliance on crustaceans and small fish, shedding light on the early dietary adaptations that enable juvenile alligators to thrive in their specific habitats.

These studies collectively underscore the adaptability of American alligators to their environments, illustrating how variations in habitat, prey availability, and intrinsic factors such as size and gender influence their feeding strategies. Understanding these dietary habits and conditions is crucial for the conservation and management of alligator populations, as well as for preserving the health of the ecosystems they inhabit. By synthesizing insights from these key studies, we gain a comprehensive view of the factors that influence alligator dietary patterns, contributing to our broader understanding of their ecological roles and the dynamic nature of aquatic ecosystems.

5 Description of the Variables

The study of alligator food choices involves several variables classified into independent and dependent categories, with distinctions between continuous, ordinal, and nominal types. Below is a detailed description of these variables:

5.1 Independent Variables

- **Lake of Capture (L):** This nominal variable identifies the lake where each alligator was captured. The categories are as follows: *Hancock, Oklawaha, Trafford, George*
- **Gender (G):** Another nominal variable indicating the gender of the alligator. It is a binary variable and has two categories: *Male, Female*.
- **Size (S):** This is a binary ordinal variable that classifies alligators based on their length (in meters). The categories are: $\leq 2.3, > 2.3$

5.2 Dependent Variable

- **Primary Food Type**: The primary food type, in volume, found in an alligator's stomach is a nominal dependent variable with five categories: *Fish, Invertebrate, Reptile, Bird, Other*

6 Research Questions

Our study aims to explore the dietary habits of alligators, focusing on the primary food type found in their stomachs. We classify these alligators based on the lake of capture, gender, and size. The research questions are structured to unravel the complex interactions between these variables and their impact on the alligator's primary food choice. To be specific, we are interested in:

- **Impact of Lake Ecosystem on Specific Diets** (How does the primary food type consumed by alligators vary across different lakes, and does this variation hold when controlling for size and gender?)
- **Gender-based Dietary Preferences** (Are there significant differences in the primary food types consumed by male and female alligators, and do these differences persist when accounting for the lake of capture and size?)
- **Size as a Determinant of Dietary Range** (How does the size of an alligator affect its likelihood of consuming broader categories of food, particularly when looking at interactions with gender and lake of capture?)
- **Correlation Between Alligator Size and Lake Habitat** (Is there a significant association between the size of alligators and their lake of capture?)
- **Gender Distribution Across Lakes** (Does the gender distribution of alligators vary significantly among the different lakes, and what might this indicate about habitat preferences or reproductive sites?)
- **Multifactorial Influences on Diet Choices** (How do combinations of predictor variables (lake, gender, size) influence the primary food type of alligators?)

7 Peer Assessment

All of we three decides the topic, group name, and search for relative papers. For writing of this report, Zihan Wang is responsible for the background and literature review section. Yiquan Xiao is responsible for the research question section. and Yusen Wang is responsible for the remaining sections.

References

[1] Michael F. Delany and C. L. Abercrombie. “American alligator food habits in northcentral Florida”. In: Journal of Wildlife Management 50 (1986), pp. 348–353. url: https://api.semanticscholar.org/CorpusID:87689453.

[2] Michael F. Delany, Stephen B. Linda, and Clinton T. Moore. “Diet and Condition of American Alligators in 4 Florida Lakes”. In: 1999. url: https://api.semanticscholar.org/CorpusID:87104107.

[3] Steven G. Platt, Christopher G. Brantley, and Robert W. Hastings. “Food Habits of Juvenile American Alligators in the Upper Lake Pontchartrain Estuary”. In: 1990. url: https://api.semanticscholar.org/CorpusID:54660192.

[4] Amanda Nicole Rice. “DIET AND CONDITION OF AMERICAN ALLIGATORS (Alligator mississippiensis) IN THREE CENTRAL FLORIDA LAKES”. In: 2004. url: https://api.semanticscholar.org/CorpusID:85680743.