

Comparing the Diets of Diurnal and Nocturnal Raptors

Jericho B. Cook, Sara S. Taylor, Allen H. Hurlbert

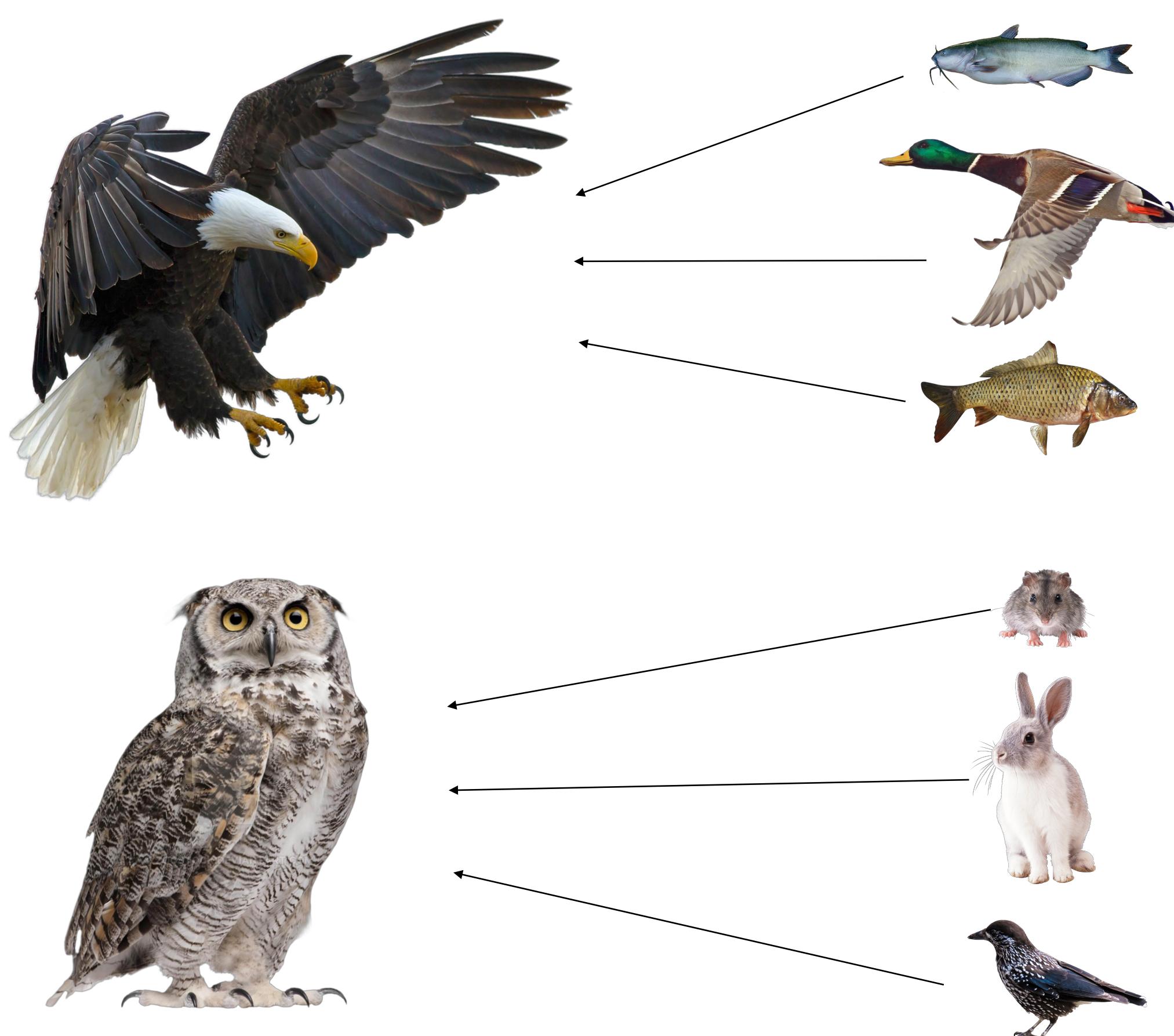
The University of North Carolina at Chapel Hill, Department of Biology

Introduction

The diets of diurnal and nocturnal birds of prey vary in composition based on their differing temporal hunting strategies; however, morphology is also a critical component in determining what kind of prey a given predator is able to predate upon.

Research question: **Does raptor diet in North America vary across time and space due to activity, size, or a combination of the two?**

Methods



Avian Data

- Raptor data from North American Avian Diet Database, Hurlbert Lab, UNC Chapel Hill
- Diurnal raptors of interest – Family Accipitridae (25 total)
- Nocturnal raptors of interest – Family Strigidae (18 total)
- 9,053 individual entries for all raptors of interest
- 172 individual studies for all raptors of interest
- Earliest study for all raptors of interest began in 1912 and latest study ended in 2013

Analyses

- Principal components analysis (PCA) of prey items and prey weight or volume
- Linear models with female mass, wing length, tarsal length and a unitless ratio of wing length to tarsal length

Results

Figure 1 – PCA of prey items

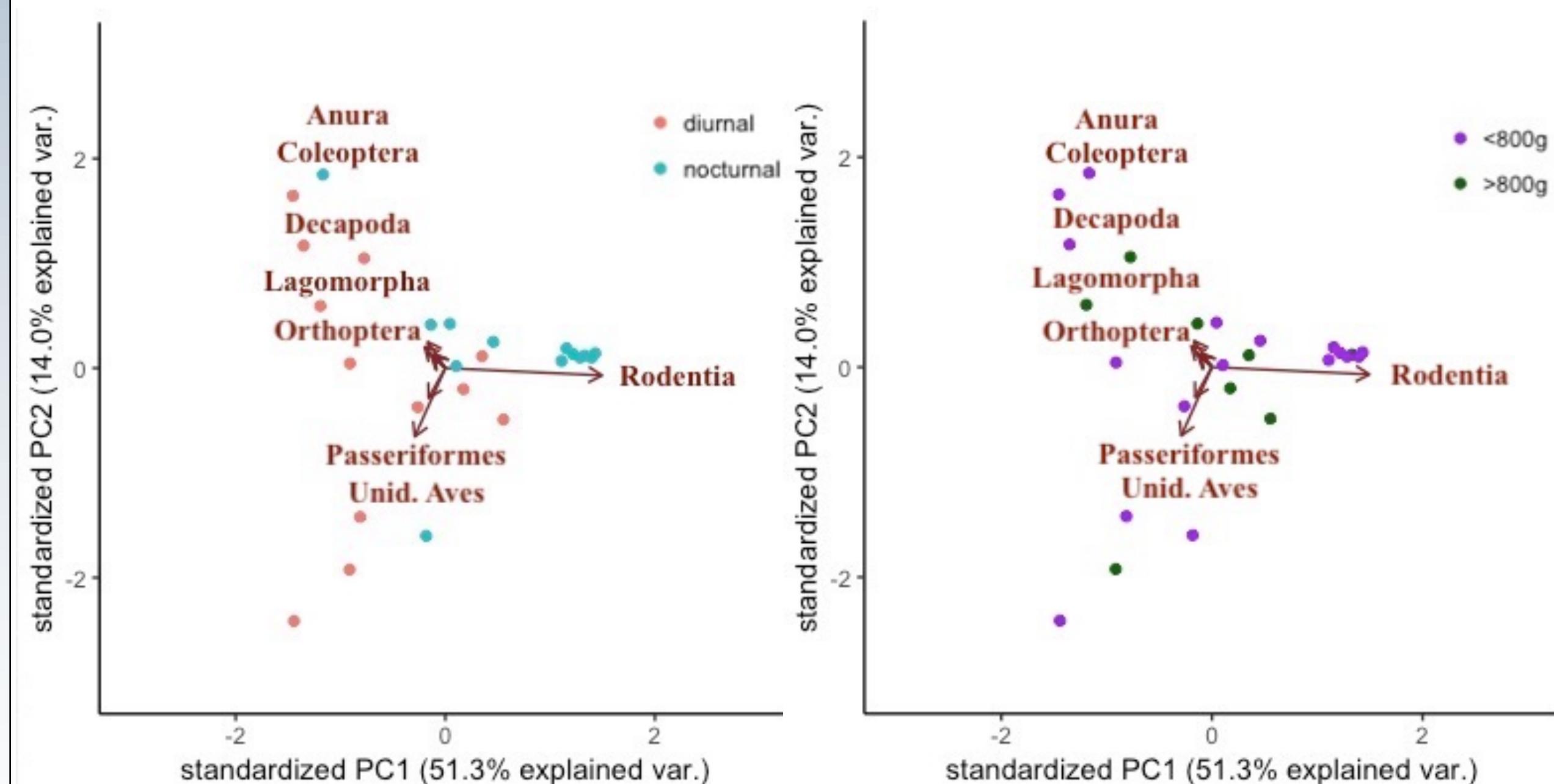
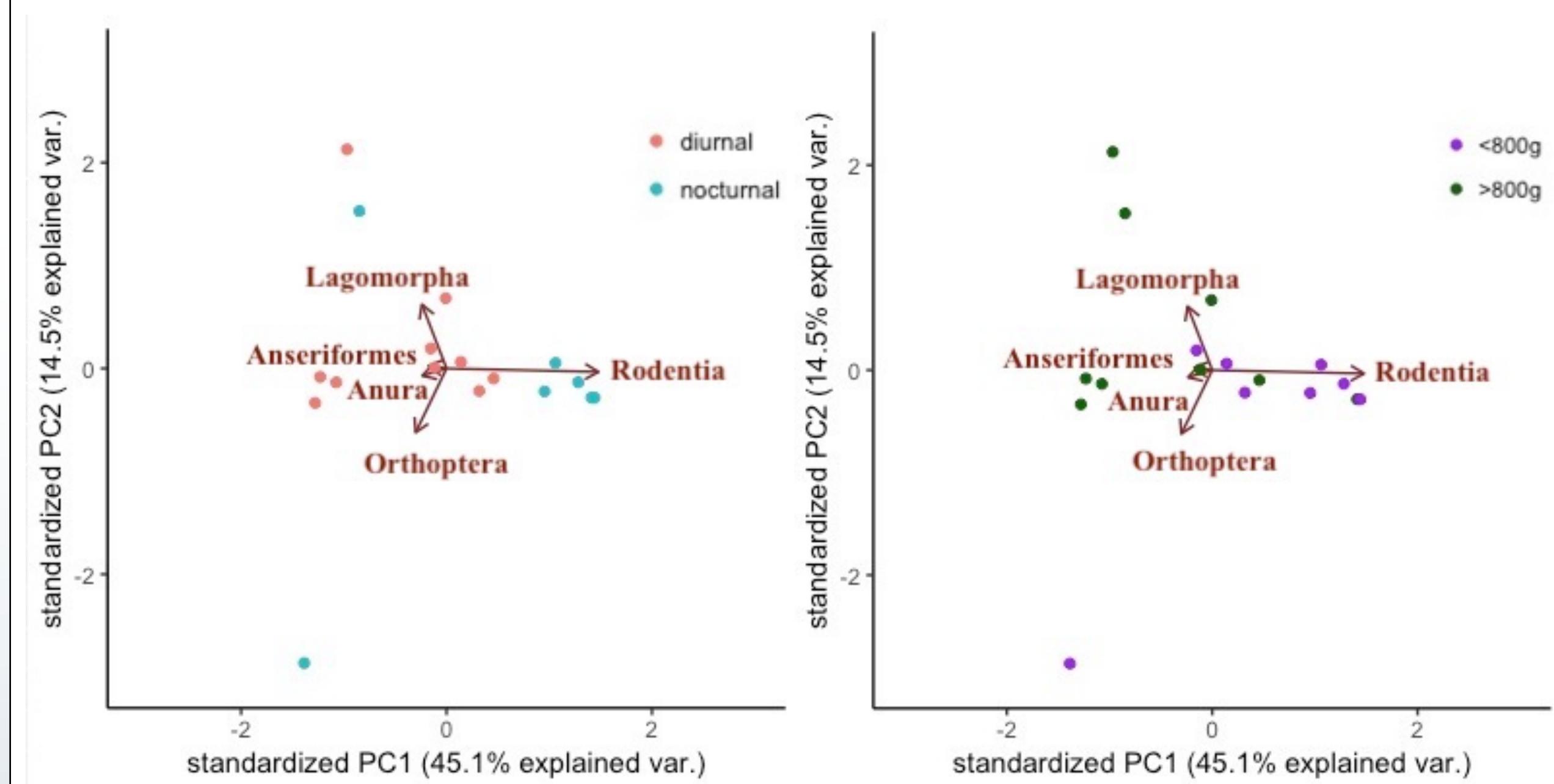


Figure 2 – PCA of prey weight or volume



Tables

Linear Model of PC1 by Weight or Volume

	Estimate	Std. Error	t value	Pr(> t)
Mass	-2.708E-04	8.02E-05	-3.377	0.00550 **
Wing Length	3.6209E-03	9.202E-04	3.935	0.00198 **
Tarsal Length	-1.173E-02	5.199E-03	-2.257	0.04345 *
Wing/Tarsus	-5.567E-02	4.31E-02	-1.292	0.22078

Linear Model of PC2 by Weight or Volume

	Estimate	Std. Error	t value	Pr(> t)
Mass	-5.89E-05	5.78E-05	-1.018	0.0527 .
Wing Length	9.92E-05	6.63E-04	0.149	0.8836
Tarsal Length	8.85E-03	3.75E-03	2.362	0.0359 *
Wing/Tarsus	4.44E-02	3.11E-02	1.428	0.1788

Discussion

- Mass, wing length and tarsal length are important in determining principal component 1 (PC1), and to some extent principal component 2 (PC2), for prey weight or volume only and not for prey items
- Nocturnal activity corresponds to diets consisting mainly of rodentia