



# Reptile abundance in Clark County from road cruising surveys

**PRELIMINARY ANALYSES OF CITIZEN SCIENCE DATA**

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# Introduction

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Many reptiles are rare and/or cryptic

Still need information on presence, abundance, and trends



# Introduction

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Nevada Department of Wildlife (Jason Jones) started a road cruising program at nine routes across Clark County

Recruited volunteers (i.e., interested and dedicated amateur herpetologist)

Partially funded by DCP

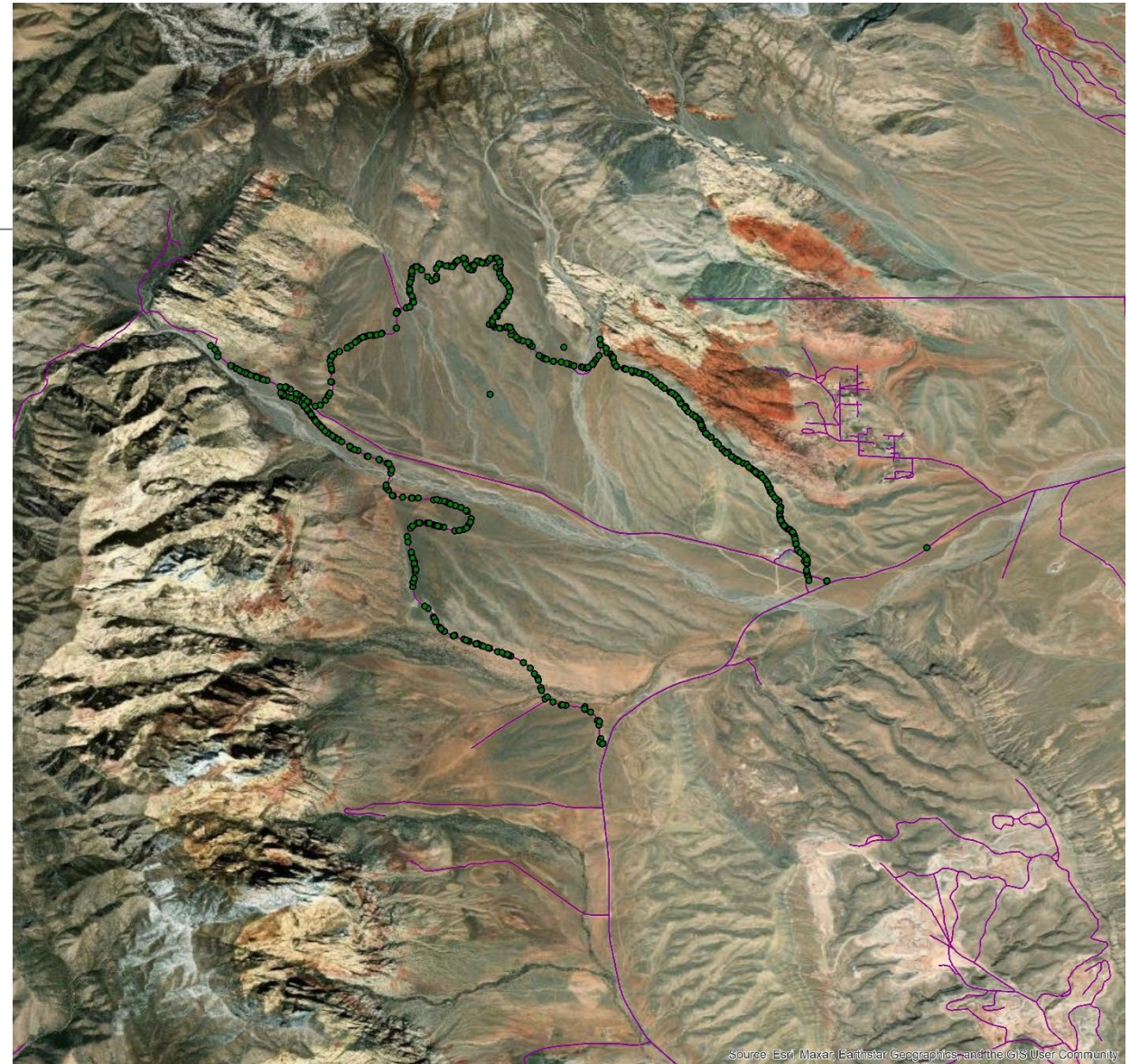
# Methods

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Drive route from one end to another (i.e., a 'pass')

Multiple passes in a single evening (usually 3)

Recorded species observed, whether dead or alive

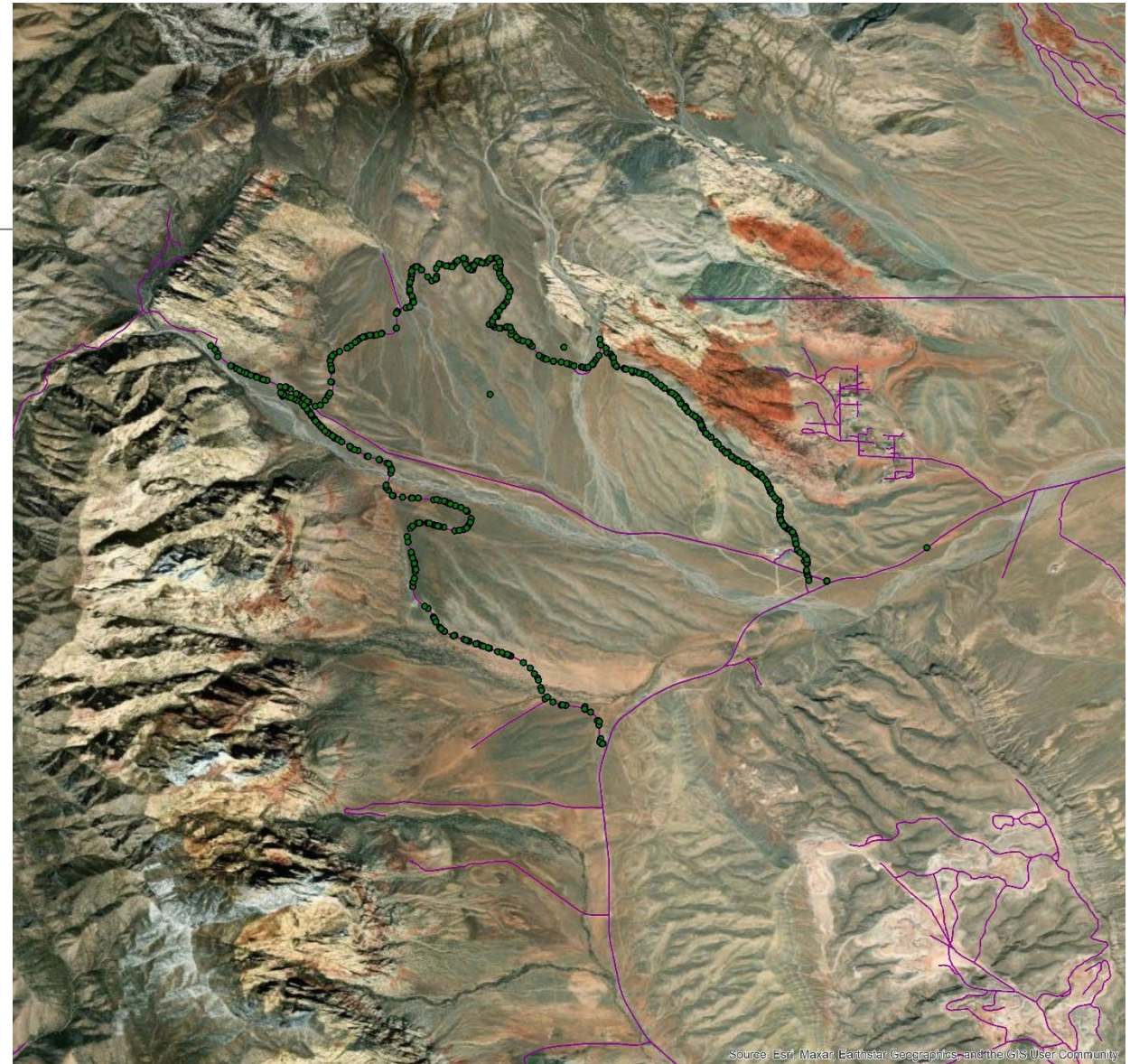


# Methods

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2022 high rainfall year

Potential 'gecko fatigue', where observers stopped recording geckos after the first few



Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

# Methods

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N-mixture modeling to estimate apparent nightly abundance of reptiles after accounting for imperfect detection



# Methods

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N-mixture modeling to estimate apparent nightly abundance of reptiles after accounting for **imperfect detection**



# Methods

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N-mixture modeling to estimate apparent nightly abundance of reptiles after accounting for **imperfect detection**

Graph apparent nightly abundance from May-October of 2022 as case study





# Results

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Frequency of observations by species in 2022 along Red Rock transect:

Common name	Scientific name	Number of observations
WESTERN BANDED GECKO	<i>Coleonyx variegatus</i>	39
DESERT NIGHT LIZARD	<i>Xantusia vigilis</i>	9
RED-SPOTTED TOAD	<i>Anaxyrus punctatus</i>	5
NORTHERN MOJAVE RATTLESNAKE	<i>Crotalus scutulatus scutulatus</i>	2
VARIABLE GROUNDSNAKE	<i>Sonora semiannulata semiannulata</i>	2
SMITH'S BLACK-HEADED SNAKE	<i>Tantilla hobartsmithi</i>	2
SIDE-BLOTCHED LIZARD	<i>Uta stansburiana</i>	2
GLOSSY SNAKE	<i>Arizona elegans</i>	1
WESTERN WHIPTAIL	<i>Aspidoscelis tigris</i>	1
PANAMINT RATTLESNAKE	<i>Crotalus stephensi</i>	1
LONG-NOSED LEOPARD LIZARD	<i>Gambelia wislizenii</i>	1
CALIFORNIA KINGSNAKE	<i>Lampropeltis californiae</i>	1
COACHWHIP	<i>Masticophis flagellum</i>	1
GREAT BASIN GOPHERSNAKE	<i>Pituophis catenifer deserticola</i>	1
LONG-NOSED SNAKE	<i>Rhinocheilus lecontei</i>	1

# Results

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Detection probability of individual animals

Western banded gecko:

0.583 (95% CI 0.399 – 0.745)



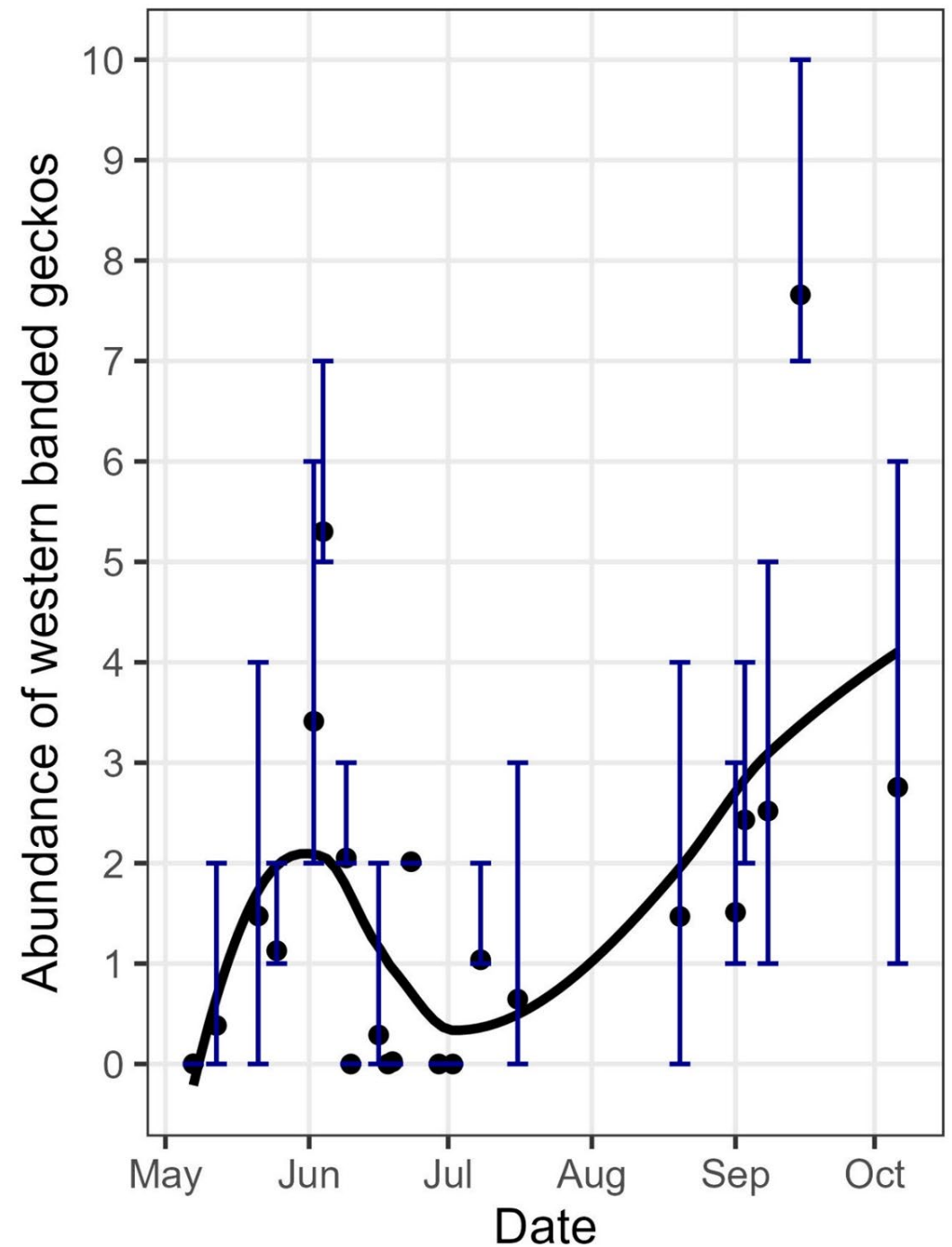
Desert night lizard:

0.144 (95% CI 0.045 – 0.376)



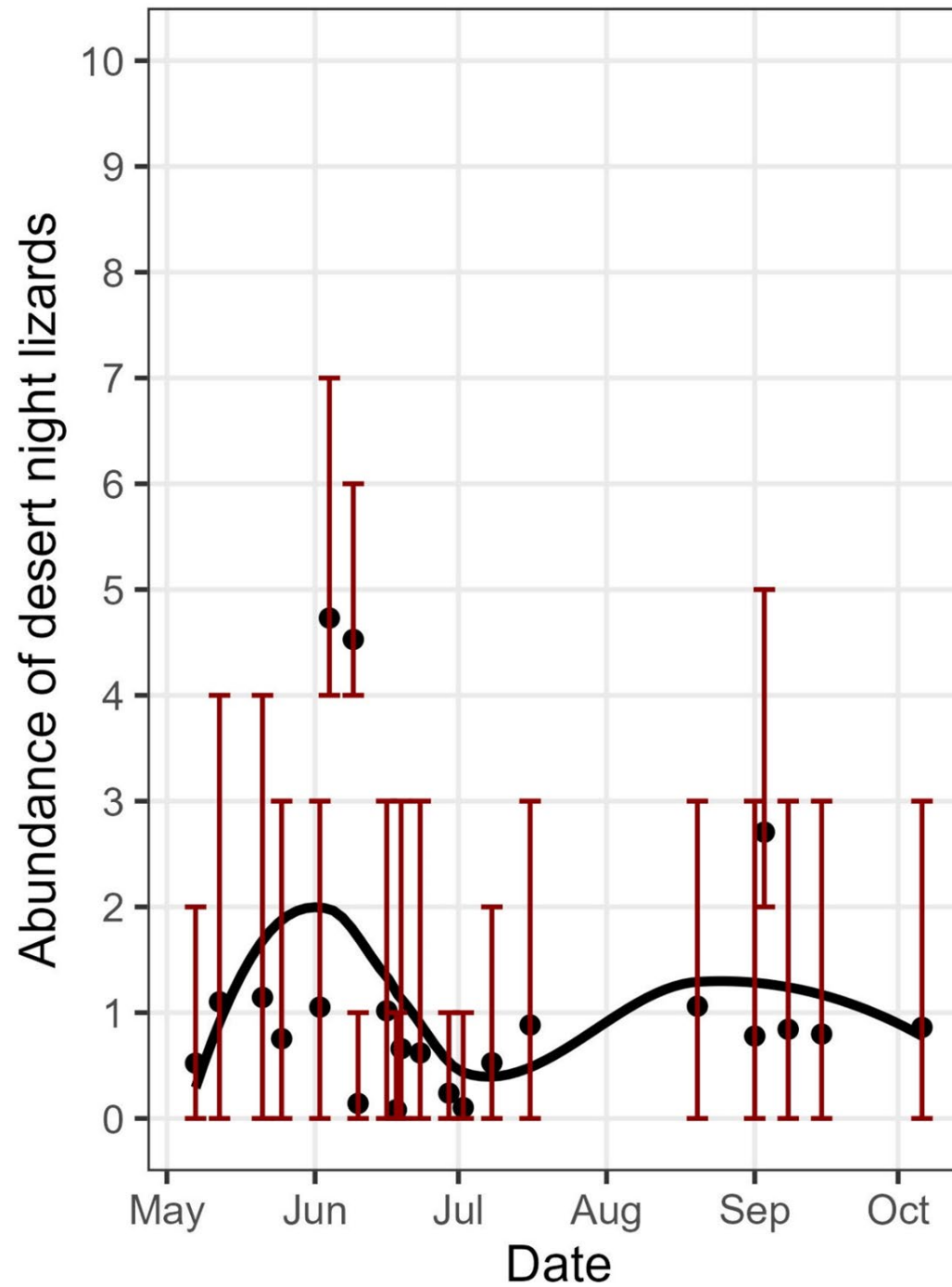
# Results

Western banded gecko abundance  
Red Rock transect, 2022



# Results

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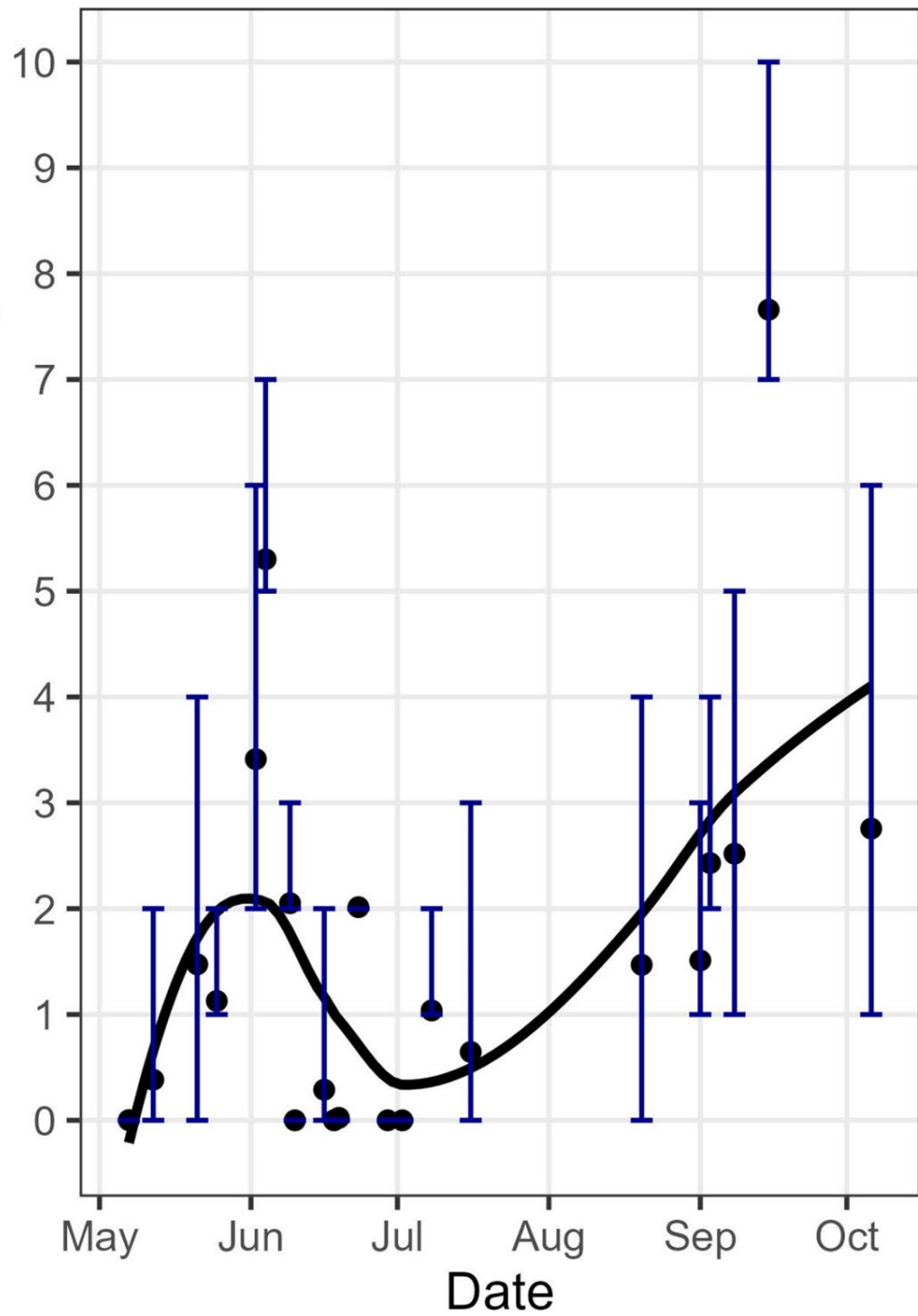


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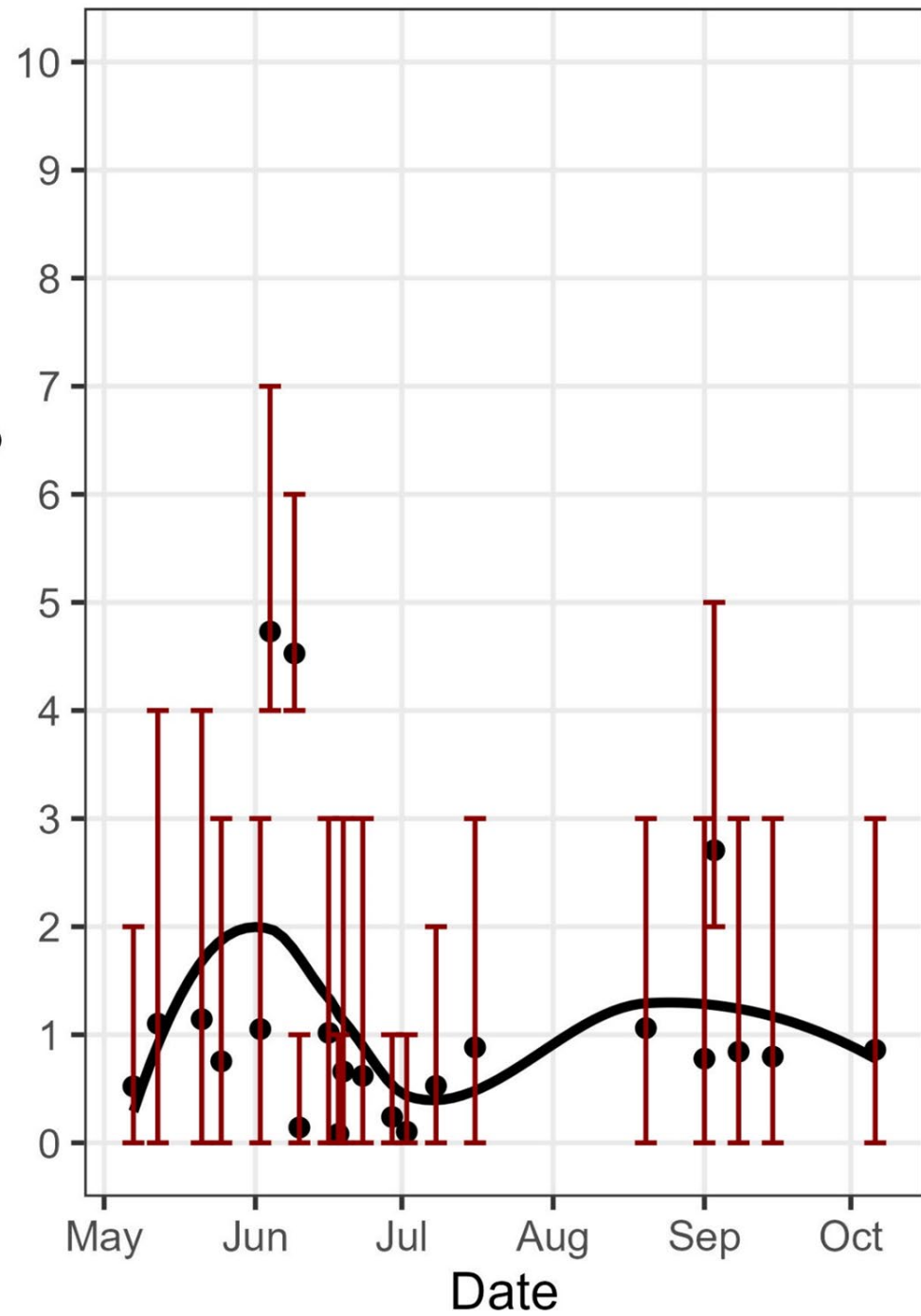
Desert night lizard  
abundance

Red Rock transect,  
2022

Abundance of western banded geckos



Abundance of desert night lizards



# Discussion

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- Gecko abundance generally higher and more variable than lizards
- Both species showed bimodality in peak apparent abundance, early June and early September
- Current approach assumes independence among survey nights and closed population within survey nights

# Discussion

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Could be analyzed differently with additional assumptions

- Single annual abundance estimate
- Requires assuming demographic and geographic closure from May-Oct
- Pool surveys across passes within a survey night
- Need to assume individuals available for detection all season (e.g., present, but adjacent to road)

# Discussion

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No matter how analyzed, inference is limited by few observations per species, so most useful for the most common or most visible species





Questions?

