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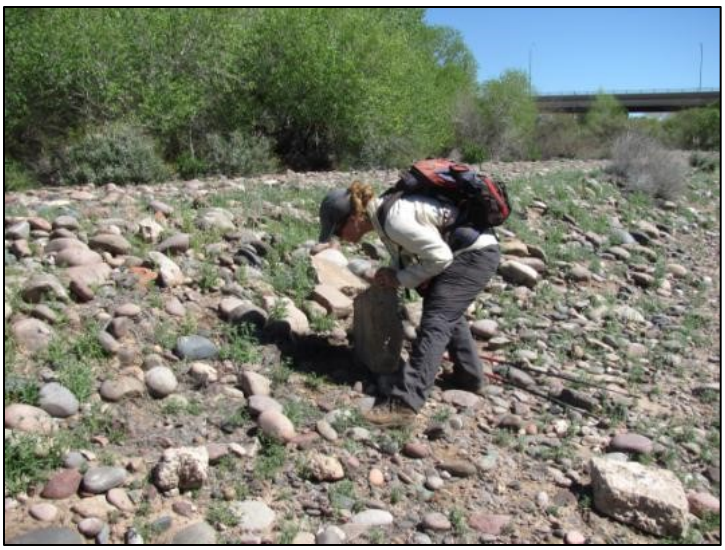
DATA Nugget

Lizards, Iguanas, and Snakes! Oh My!

Featured scientists: Heather Bateman & Mélanie Banville from Arizona State University

Research Background:



Scientist Mélanie searching for reptiles in the Central Arizona-Phoenix LTER.

Throughout history people have settled mainly along rivers and streams. Easy access to water provides resources to support many people living in one area. In the United States today, people have settled along 70% of rivers.

Today, rivers are very different from what they were like before people settled near them. The land surrounding these rivers, called **riparian habitats**, has been transformed into land for farming, businesses, or housing for people. This **urbanization** has caused the loss of green spaces that provide valuable services, such as water filtration, species diversity, and a connection to nature for people living in cities. Today, people are trying to restore green spaces along the river to bring back these services. Restoration of disturbed riparian habitats will hopefully bring back native species and all the other benefits these habitats provide.

Scientists Heather and Mélanie are researchers with the Central Arizona-Phoenix Long-Term Ecological Research (CAP LTER) project. They want to know how restoration will affect animals living near rivers. They are particularly interested in reptiles, such as lizards. Reptiles play important roles in riparian habitats. Reptiles help energy flow and nutrient cycling. This means that if reptiles live in restored riparian habitats, they could increase the long-term health of those habitats. Reptiles can also offer clues about the condition of an ecosystem. Areas where reptiles are found are usually in better condition than areas where reptiles do not live.

Heather and Mélanie wanted to look at how disturbances in riparian habitats affected reptiles. They wanted to know if reptile **abundance** (number of individuals) and **diversity** (number of species) would be different in areas that were more developed. Some reptile species may be sensitive to urbanization, but if these habitats are restored their diversity and abundance might increase or return to pre-urbanization levels. The scientists collected data along the Salt River in Arizona. They had three sites: 1) a non-urban site, 2) an urban disturbed site, and 3) an urban rehabilitated site. They counted reptiles that they saw during a survey. At each site, they

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searched 21 plots that were 10 meters wide and 20 meters long. The sites were located along 7 transects, or paths measured out to collect data. Transects were laid out along the riparian habitat of the stream and there were 3 plots per transect. Each plot was surveyed 5 times. They searched for animals on the ground, under rocks, and in trees and shrubs.

Scientific Question: How do urbanization and riparian rehabilitation impact reptile diversity and abundance?

What is the hypothesis? Find the hypothesis in the Research Background and underline it. A hypothesis is a proposed explanation for an observation, which can then be tested with experimentation or other types of studies.

What do you predict? Given the hypothesis, what are your predictions for lizard abundance and diversity at the three sites?

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Scientific Data:

Use the data below to answer the scientific question:

Reptiles	Non-Urban	Urban Rehabilitated	Urban
Tiger Whiptail Lizard	9	12	0
Common Side-blotched Lizard	8	15	4
Zebra-tailed Lizard	4	2	2
Desert Spiny Lizard	10	0	0
Ornate Tree Lizard	5	7	0
Desert Iguana	2	0	0
Long-tailed Brush Lizard	3	0	0
Western Diamond-backed Rattlesnake	1	0	0
Reptile Diversity			
Reptile Abundance			

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What data will you graph to answer the question?

Independent variable: _____

_____

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Dependent variables: _____

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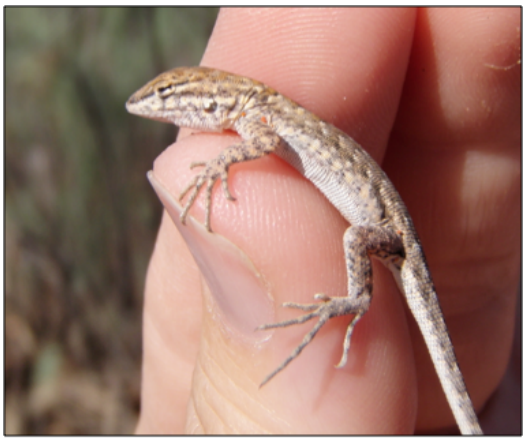
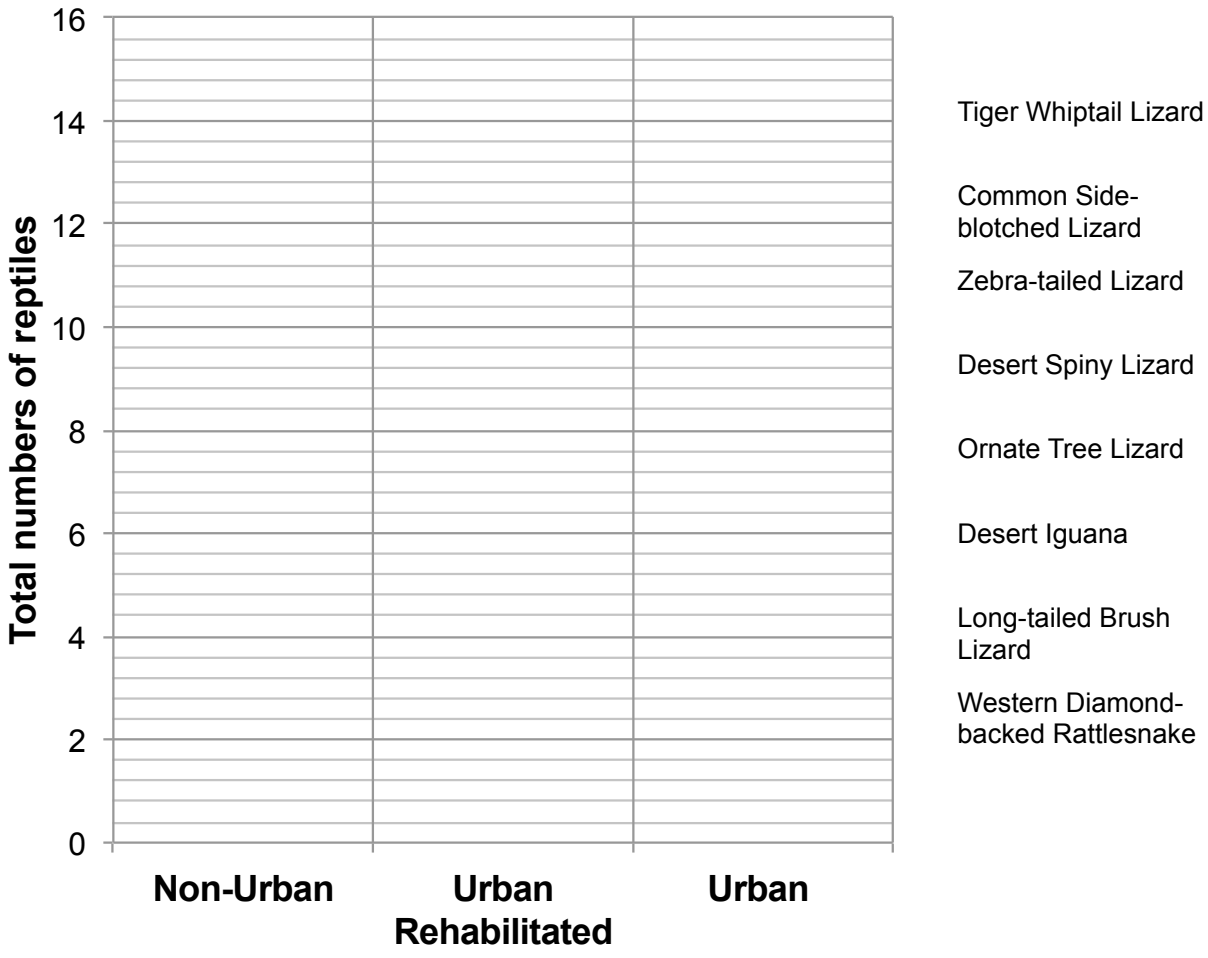


The Common Side-blotched Lizard

Graph the data below:



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Interpret the data:

Make a claim that answers the scientific question.

Support your claim using data as evidence. Describe the relationship between the dependent and independent variables. Refer to specific parts of the table or graph.

Describe your scientific reasoning and explain how the evidence supports your claim.

What do the data from this study tell us about the scientist's hypothesis?

Your next steps as a scientist: Science is an ongoing process. What new question do you think should be investigated? What future data should be collected to answer this question?