

WILDLIFE VISITS TO SANDIA MOUNTAIN SPRINGS

It is suggested that you watch [“Mud Spring: From Water to Wildlife” video lesson](#) before doing this assignment.

Read this background information to learn about the SMNHC, natural springs, why they’re important to wild animals, and trail cameras at them (after watching the video, much of this information will be review).

Sandia Mountain Natural History Center



The Sandia Mountain Natural History Center (SMNHC) is an environmental education center in the Sandias, east of Albuquerque, New Mexico. It is run by staff from the New Mexico Museum of

Natural History and Science and Albuquerque Public Schools (APS). If you went to elementary school in the Albuquerque area, you likely visited in 5th grade for the Ecology Field Program.

This land is at about 7,000 feet elevation, with a forest of piñon pine, juniper, Ponderosa pine, oak, and fir trees. The ecosystem is home to a wide variety of animal (consumer) species, providing good habitat and resources that help them survive here.

The Springs



Two natural springs, Mud and Paradise, are located along the Mud Spring Loop trail, in Cibola National Forest.

Paradise spring dried up when the groundwater filling it in dropped below ground in early 2012. Because it is now 2-3 feet underground, animals can no longer drink from it. As of 2020, Mud spring still has a little water above ground, but its level has been dropping too.



There are a number of reasons why the springs could be drying up: less snowfall, less rain, humans using water in their homes, changes to the water flow underground, or even from an increase in plant growth! The water level may drop if water is removed faster than it is added.

Climate change has led to years of drought (less snow and rain) in New Mexico, so it could also be a cause for springs disappearing underground.

Trail Cameras



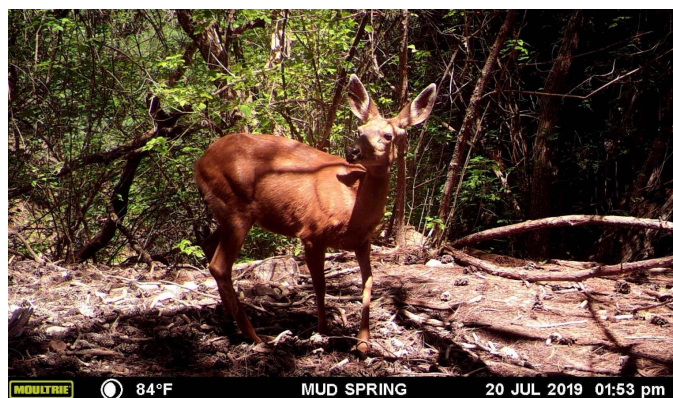
Trail cameras (or “game” cameras) are mounted on trees facing each of the natural springs. These cameras have motion and heat-sensing abilities, so they automatically take pictures when they detect an animal.

The cameras are left on all the time, capturing close-up images of wildlife that visit Mud and Paradise springs. Cameras have been at both locations since 2008.

Animals Visiting the Springs

Natural springs are very important to animals in the Sandia mountains, since there aren’t many drinkable water sources here (very few streams, no lakes or ponds).

By monitoring animal visits to the springs, we can learn many things: which animal species live here, population sizes and how they change, what times of day or months of the year animals are active and visiting, and even the air temperature when they visit.



Scientists can also use this data to learn more about characteristics and health of individual animals, behaviors and ranges of species, impacts of climate change on wildlife, and how many young are born. Plus, we get to see lots of cool photos of wildlife that usually hide away from us humans!



Your job is to do the work of a wildlife biologist by using real data of animal visits to Mud and Paradise springs since 2008. You will make hypotheses, graph the data, and analyze it.

PART 1. MAKING PREDICTIONS

Write hypotheses for patterns you predict to see in animal visits to the springs.

- Choose two species to make predictions about from the list.
- Choose one of the variables.
- State in each hypothesis whether you are discussing data from Mud spring, Paradise spring, or both springs together.

Example hypotheses:

Turkeys will visit Paradise spring most in October and November, and least in April-June.

Skunks will visit both Mud and Paradise springs more when air temperature is under 50°F.



ANIMAL SPECIES LIST

(Data is available for Mud spring, Paradise spring, and both springs combined, unless otherwise noted)

Bear

Cooper's Hawk *(Mud spring only)*

Coyote

Deer

Fox

Ringtail

Skunk *(Combined data only)*

Turkey

VARIABLES

Year (2008-2019)

Month

Time of day:

Late night (Midnight-4am)

Early morning (4-8am)

Morning (8am-Noon)

Afternoon (Noon-4pm)

Evening (4-8pm)

Night (8pm-Midnight)

Air temperature (°F):

<10°, teens, 20's, 30's, 40's, 50's,

60's, 70's, 80's, 90's



PART 2. GRAPHING THE DATA

Find the datasets on the [Wildlife Visits Spreadsheet](#) for the animals, variable, and spring(s) you used in your hypotheses.

Graph the data.

You are being supplied with real data of animal visits, collected from all photographs taken by the trail cameras from 2008-2019.

Use a computer graphing program (Excel, Google Sheets, etc.), or graphing paper (or draw your own grid) to graph the data.

Find and graph only the sets of data that apply to your own predictions (the species, variable, and springs you wrote in your hypotheses).

You may graph your data for both animals as two different lines (or 2 sets of bars) on the same graph.



Graphing Steps:

- Choose which type of graph is best to use for your data: a line graph, bar graph, pie chart, etc.
- Label your x and y axes (or wedges of your pie) clearly.
- Decide what intervals you need to divide each axis by in order to fit your data on the graph well. (by 1 year, 20 visits, etc.)
- Graph the numbers in your dataset carefully, and use a different color for each animal.
- Make a color-coded key to label each dataset.
- Give your graph a descriptive title.



PART 3. ANALYZING THE DATA

Answer the following questions for each animal, based on the variable you chose.



Finally, respond to these additional critical thinking questions.

- 1) If *you were* the species you chose, when would you choose to come to the spring(s)? Think about your different survival needs and threats. You can talk about *any* of the variables (not just the ones you chose) or any other reasons in your answer.
- 2) Choose one of the animals you looked at data for. Make a prediction for how their visits might change over the next 20 years. Sketch a new graph of your prediction. (You don't have to come up with exact numbers, just a general pattern.)
- 3) Think of some ways that climate change may affect animals and their ecosystem in the Sandia Mountains (temperature, amount of moisture, weather events, etc.). What are some local animal species that may be most affected, and why? How about least affected? Feel free to discuss any species that live in these mountains, including ones that weren't part of this lesson.



- 1) Which month(s)/year(s)/time range(s)/temperature range(s) had the most visits by the species you chose? Why might they visit most during those times or conditions?
- 2) Which had the least visits? Why do you think this may have been?
- 3) Compare your hypothesis for each animal species to the actual data trends. Would you consider your hypothesis to be correct? Why or why not?
- 4) What other real world data or information would you want to have in order to investigate *why* the visits changed from one month/year/time period/temperature range to the next?
- 5) If you were going to design an experiment to find out why this animal species visited more during certain months/years/times of day/temperatures than others, what possible cause would you choose to research, and why?

