

## Oh Cougar!

**Objectives:** Students will play a game where they represent cougars and habitat components to demonstrate population fluctuations. They will be able to identify food, water, shelter, and space as the 4 components of habitat. They will also understand the limiting factors of a given habitat and recognize that some fluctuations in wildlife populations are normal. Vocabulary includes limiting factors, carrying capacity, and habitat. This activity is adapted from Project WILD's, Oh Deer!

**Audience:** This teacher-led activity can be modified for any age group, but is most suitable for upper elementary. You will need at least 12 children to play.

**Science Standards:** K-LS1-1 Use observations to describe patterns of what plants and animals (including humans) need to survive; K-ESS3-1 Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live; 1-LS1-1 Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs; 2-LS4-1 Make observations of plants and animals to compare the diversity of life in different habitats; 3-LS4-4 Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change; 3-LS4-3 Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all; 5-LS2-1 Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

**Background: Carrying capacity** is the largest population of a species that a habitat can sustain. This is based on the number of animals in a given area and the availability of resources. The fundamental necessities of life for any animal are food, water, shelter, and space in a suitable arrangement. These are a species' **habitat**. If a population grows too large, it will deplete its habitat's resources and therefore some will not survive. The population will decrease naturally to a more suitable size for its habitat allowing the resources to recover.

The amount of resources available are a **limiting factor** to how large a population can grow, in other words the resources are the factors that limit population growth. Other natural limiting factors can be disease, predators, fire and other weather impacts. There are also human-caused limiting factors like vehicle collisions, hunting, pollution, and habitat destruction.

Wildlife populations are not static; they are always changing and fluctuating. In this activity, students will see how limiting factors contribute to fluctuations in wildlife populations, how a population will increase until a limiting factor occurs, how habitat is key to survival, and how nature is constantly changing.

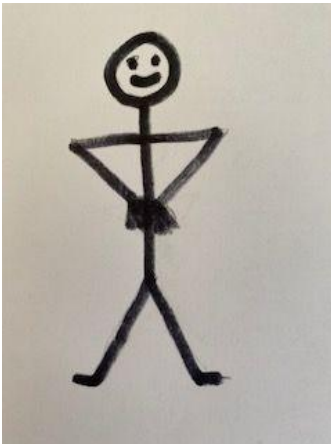
In this activity, students simulate being a cougar in a closed ecosystem. They can not leave or move outside of their habitat to get what they need. Keep in mind that in the wild, animals often look for another place to live if they cannot find food, water, shelter, or a suitable amount of space.

**Supplies:** A large area to play in, either outside or indoors, and a chalkboard or flip chart to record results.

**Instructions:** After talking generally about cougars (a good background can be found in the cougar craft activity) and reviewing habitat components and their importance to all species's survival with the class, you can explain the game.

1. Assign a quarter of the class to be cougars. This can be done by counting off in fours and choosing one number to be the cougars or just picking approximately  $\frac{1}{4}$  of the class.
2. The cougars will stand behind a line facing another line about 10-20 yards away. The other  $\frac{3}{4}$  of the class will stand behind the 2nd line. If done in the gym, you can use existing lines on the floor. In other spaces, delineate with tape, cones or anything else.
3. The cougars need to find food, water, shelter, and space to survive. The non-cougar students will be either food, water, shelter, or space.
4. Explain to the students that they will be representing their chosen habitat component with hand signals. Hands over their stomach represents food, hands over their mouth represents water, hands in an upside down V or tent shape over their heads represents shelter, and hands down and out at either side of their waists represents space. Here is a picture representation:

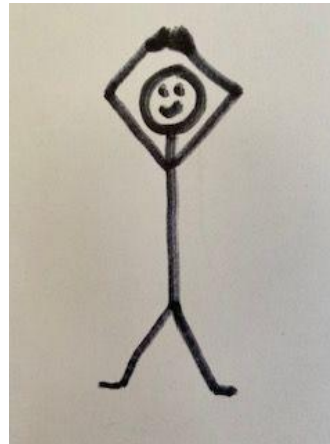
**Food**



**Water**



**Shelter**



**Space**



(With very young children, preschool- first grade, you may want to use only food, water, and shelter.)

5. The activity starts with the 2 lines of students facing away from each other. The cougars will choose which habitat component they are looking for and the habitats will choose which component they want to be. This can change with every round. (With younger children, you may want to assign them a sign for the first few rounds.)
6. Both sides will make the sign of the component they chose and can not change signs once they've chosen until the next round. (This is hard for younger kids so it can be helpful to have an adult with each line reminding them and monitoring this.)
7. At your signal, both lines turn around. The cougars go looking for the matching component to the one they chose. If a cougar is making the sign for water, they look for water from the habitat line. The same goes for food, shelter, and space.
8. Cougars should safely hurry over to the habitat line to claim their matching sign and bring them back to the cougar line. Capturing a habitat component represents meeting their needs and

successfully reproducing. The captured habitat becomes a cougar in the next round. A habitat component can only be captured by the first cougar who gets to them.

9. Any cougar who does not capture their habitat component does not meet their needs and therefore dies and becomes part of the habitat line. They become habitat components for the next round of cougars.
10. If a habitat component is not captured by a cougar, they remain habitat. They can change which component they are each round.
11. Repeat this activity 10-15 times, taking note of how the population of cougars fluctuates with availability of habitat components. Habitat is a limiting factor. You can record the results on a flipchart or chalkboard as a line graph, or have a student recorder write it down on paper and create the line graph together as a class after the game is over.

**Extensions:** After several rounds of play, especially with older kids, you can introduce other limiting factors.

1. Tell all of the habitat line that there has been a drought and there is no water available. None of them should make the sign for water. The same can be done with food.
2. Introduce a human-caused limiting factor into the game. Tell the habitat line that people have destroyed an area, building a housing development. This could take away space and/ or shelter from the area.
3. Tell the habitat line that there has been a huge flood and they are all going to be water for one round.
4. Introduce another predator into the game, one who can steal food from the cougars, like a wolf or grizzly bear. This predator can take food components from the cougars once they've captured them, but before they get back to the cougar line.
5. Make sure to discuss how these limiting factors affected the cougar populations.

**Discussion:** Have the students talk about the results and what they experienced.

1. When there were only a few cougars, were they able to find the habitat components they needed?
2. What about when there were lots of cougars? Could they all get what they needed?
3. Do they see any patterns in the chart they recorded the results on?
4. Talk about the population fluctuations. Were these patterns different when you introduced limiting factors? What about human caused limiting factors?
5. Discuss how in nature, populations also fluctuate up and down depending on habitat availability, and how human development is often the biggest threat to wildlife.
6. In the real world, what would a cougar do if they could not find what they needed in a given habitat?