



5 MODELING PANTHER TERRITORY AND PATHWAYS



ESTIMATED TOTAL TIME
90 minutes

- ▶ Grades 9-Adult
- ▶ Life Sciences, General to Advanced
- ▶ Math and Geography Connections

In this activity, students explore and evaluate the importance of the Florida Wildlife Corridor in supporting wildlife. They first analyze photography of the Florida panther from corridor lands to help them visualize broader territory characteristics. They use a GIS mapping tool to view lands with open space and human development and then create models for territory that Florida panthers would require to survive and thrive, based on the geography of their local communities. They identify potential locations for wildlife corridors and crossings based on their exploration and evaluation.

For younger audiences, such as introductory biology classes, students can collaborate through the StoryMap exploration, jigsaw discussion, and MapMaker analysis activities with connection points to check for understanding between each step.

For advanced high school and adult audiences, participants can explore StoryMap and MapMaker in pairs or independently to allow for advanced learner-centered investigation.

KEY TERMS

- ▶ fragmented habitat
- ▶ territory
- ▶ wildlife corridor
- ▶ wildlife crossing

BACKGROUND

Large mammals, including the endangered Florida Panther, need expansive **territories** to survive and thrive, but rapid land development for houses and roads is encroaching on their habitats.

Wildlife corridors connect habitats fragmented by human activity, protecting critical areas for wildlife and people. They enable animals to travel safely between larger wild spaces, provide clean water for humans, and

maintain healthy ecosystems. Wildlife corridors can include meadows, forests, protected lands, and also aquatic and marine areas. Human-made structures like highway overpasses, underpasses, tunnels, viaducts, and canopy bridges,



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known as **wildlife crossings**, help animals navigate barriers like highways within these corridors.

The Florida Wildlife Corridor is vital for the survival and expansion of Florida panther populations, especially given their need for vast territories. Male panthers require areas of 200 to 250 square miles to hunt, find mates, and establish dominance. Isolated habitats limit their movement and ability to find mates outside their immediate gene pool. These corridors, composed of protected lands and natural areas, connect **fragmented habitats**, allowing

panthers to safely roam, find food, and access genetically diverse mates, which prevents inbreeding and supports population growth.

However, the Florida Wildlife Corridor faces threats from habitat fragmentation due to human development and high-speed traffic, which pose a danger to panthers crossing roads. Conservation efforts focus on securing land, building wildlife crossings, and raising awareness about the importance of protecting these corridors and their ecosystems for the future of the Florida panther and other species.

STANDARDS

This activity addresses the following:

NGSS: HS-LS2-1: Use mathematical/computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.

NGSS: HS-LS2-7: Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

Florida NGSS: SC.912.L.17.11: Analyze the distribution of organisms and how that distribution is influenced by the interactions between the biotic and abiotic factors within an environment.

OBJECTIVES

Students will:

- access prior knowledge about Florida panthers and visualize characteristics of panther territory;
- build background on the Florida panther and the Florida Wildlife Corridor;
- apply learning to develop a geographic model of panther populations relative to suitable habitat in their local community and beyond; and
- evaluate locations for wildlife corridors and crossings in Florida based on their research and geographic models.

PREPARATION

Gather and/or print materials:

- Slides: [Modeling Panther Territory and Pathways](#)
- Video: [Wildpath.com](#) (1:04; scroll down to find)
- Handout: Build Background on the Corridor and Panther (1 per student)
- Online Resource: [Connecting the Corridor StoryMap](#)
- Online Resource: National Geographic [MapMaker](#)
- Handout: Explore and Estimate Panther Numbers, Habitat, and Territory (1 per pair)
- Handout: Develop an Argument Based on Evidence (1 per small group)

Set up technology:

Determine whether students will use individual computers, or if pairs or small groups will share computers to view and interact with the [Connecting the Corridor StoryMap](#) and National Geographic [MapMaker](#).

Additional preparation:

- Familiarize yourself with [MapMaker](#) to be ready to guide students as needed. Decide which unit of measurement students will use for MapMaker (e.g., Imperial, metric).
- Optional: For younger/introductory biology students, consider creating groups for the jigsaw and MapMaker activities:
 - Divide students into five small groups to prepare for the jigsaw activity. Groups of mixed ability can work well in the initial groupings. Each group will be responsible for researching an assigned question number during the activity. Within their groups they can share a device or work individually.
 - Identify pairs of students to work together on the MapMaker Activity. They can share a device or each have a device. Pairing allows them to have a partner for problem-solving as they learn a new technology tool.



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10 MIN DISCUSS THE STORY A FLORIDA PANTHER PHOTO TELLS

1. Project the photo of the panther near a highway overpass from the slides. Have students study the photo silently for one minute to take a “slow look,” recording details of what they see. Have a short whole-class discussion about what students already know about the Florida panther and new perspectives from this photograph. Ask: *What story does this image tell?* Next have them do the same for one minute with the second photo, of a panther in a wild setting.
2. Next, have students close their eyes and visualize one of the two photos in step 1, envisioning the panther in its location. Then have them imagine flying over this place, with a bird’s eye view, for 15–20 seconds. Ask them to sketch or write what the geography or setting might look like for a one-mile radius around this panther. Give them a few minutes to share with a partner or small group.
3. Ask students to think about how much territory beyond that one-mile radius a panther might need for its range, e.g. how many square miles, and record students’ estimates on the board.
4. Show the Wildpath video (1:04; scroll down [this page](#)) and prompt students to add to their drawing (or list) human impacts that might be present in the panther’s radius as they watch. In the video, have them find the answer to the question: *How much territory does a male panther require?* (200 square miles; and females stay closer to birthplaces, roaming about 50 square miles) Have a class discussion about the pressures on panthers’ territory.
5. Use the video and other text on Wildpath.com to develop a definition of “wildlife corridor” as a group. Tell students that in this activity they will use a website and online GIS (geographic information system) to explore the geography of the Florida Wildlife Corridor.

25 MIN EXPLORE THE STORYMAP

6. For younger audiences, organize students into five groups and distribute a copy of the Build Background on the Corridor and Panther handout to each small group. Assign each group a single question; their goal is to become an expert group for that question. Together they will explore the [Connecting the Corridor StoryMap](#) and [Wildpath site](#) (linked in StoryMap) to answer their assigned question in the handout. Sharing a single device to view the StoryMap may encourage collaboration. Older students or adults may prefer to explore independently.
7. Reorganize students into a jigsaw group (optional) in which each group consists of students representing questions 1–5. While students share what they learned, have other students record the information on the handout. Circulate to encourage students to record important information and to keep them on task. For older audiences, consider small group discussions.

MORE TO EXPLORE

RESEARCH AND CREATE WILDLIFE CORRIDOR AND PATHWAY MODELS

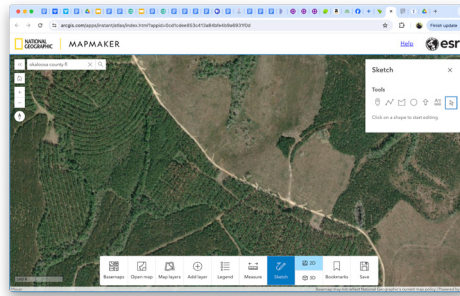
Have students work with [Florida Wildlife Corridor maps](#) and the [MapMaker](#) tool to explore the land in your area and its connections to protected lands in the corridor. What land is currently wildlife habitat, in the form of parks or preserves? Is there land that could help to connect these areas? Consider partnering with an art or engineering class to have students create wildlife corridor models, featuring [wildlife crossings](#) as well.



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25 MIN ANALYZE SATELLITE IMAGERY TO ESTIMATE POPULATION AND HABITAT SUITABILITY

- Organize students into pairs. Distribute a copy of the handout Explore and Estimate Panther Numbers, Habitat, and Territory to each pair. Review the directions, model the steps together as a class, and answer any questions students may have.
- See the slides for samples of how student maps should appear as they work through the steps.



TIP: Enough time is included here so that students will not feel rushed completing each of the steps, since using MapMaker may be new to them. If time is limited, consider assigning this section as homework.

25 MIN DEVELOP AN ARGUMENT BASED ON EVIDENCE

- Display the slide with a map of the Florida Wildlife Corridor and have students discuss it in small groups (either their initial group or jigsaw group). Distribute a copy of the handout Develop an Argument Based on Evidence. Prompt students to discuss the questions and record notes using both the map and what they have learned about the Florida panther.
- Facilitate a class discussion to close out the activity. Each group can share their answer to one question.

5 MIN REFLECT

- Ask students to respond to one of these questions in writing, handing it to you as an “exit ticket” when they leave the room:
 - Describe what makes a successful wildlife corridor.
 - How might the Florida Wildlife Corridor benefit species other than panthers?
 - How might the Florida Wildlife Corridor help the Florida panther population grow?

MORE TO EXPLORE

STUDY HUMAN IMPACTS ON BLACK BEAR M34'S PATH

Have students use the [Bear Necessities StoryMap](#) and videos included for a closer look at how one species responds to land development and habitat fragmentation. If time is limited, display the “A Closer Look” graphic with a swipe feature (scroll down about halfway) that compares a particular area of habitat in 2008 and 2020.

EXPLORE WILDLIFE CORRIDORS AROUND THE WORLD

Have students research other wildlife (e.g., pronghorn, tigers) that might benefit from the establishment of wildlife corridors. Students can learn from [this StoryMap](#) featuring land conservation goals and the role of wildlife corridors in the western U.S. and also [this project in Brazil](#). Find more about international efforts to create ecological corridors [here](#).

