Instructions: Follow along with your teacher to complete the questions below (use your own computer if available).

‘Ecoregions’ in Puerto Rico

1. Looking at the map, what are the three ecoregions of Puerto Rico?
   __________________________________________
   __________________________________________
   __________________________________________

2. Looking at the map, can you figure out why some areas of the island contain dry forest ecosystems and some contain moist ecosystems?
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### ‘Habitats’ and ‘Ecological Niches’

3. **What is a habitat?**

   - A habitat is the natural environment or physical space in which an organism lives.
   - It includes all the necessary resources for survival such as food, water, shelter, and space.
   - The habitat provides conditions that support the organism’s life cycle and is specific to the species.

4. **Looking at the map, what are some features of the habitat of the Elfin-Woods Warbler?**

   - The habitat is located in dense forests with a variety of trees and vegetation.
   - It includes areas with a high number of insects and seeds for food.
   - The map shows that the habitat is rich in understory and canopy layers, providing shelter and nesting sites.

5. **Define the term “Ecological Niche” based on the discussion.**

   - An ecological niche refers to the role an organism plays in its environment, including how it obtains resources and interacts with other species.
   - It encompasses the entire set of environmental conditions that an organism encounters and its adaptations to those conditions.

6. **Remember from the map that the Warbler lives far from roads. What does this suggest about its habitat needs?**

   - It suggests that the Warbler requires a habitat that is undisturbed by human activities, such as roads.
   - Roads can alter the habitat by creating barriers to movement, introducing invasive species, and changing the microclimate.
   - The need for a remote habitat indicates a preference for areas that are peaceful and not disturbed by human intervention.

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![Bird Island Puerto Rico Map](image1)

![Elfin-Woods Warbler](image2)
Research and Assess Biodiversity

7. Reading the Neotropical Birds website, what are the physical characteristics of this species, and what does it prefer to eat?

8. According to the IUCN website (or class discussion), is this species considered critically endangered (CE), endangered (EN), or vulnerable (VU)?

9. What are the differences between the CR, EN, and VU classifications?

EX  No reasonable doubt that the last individual has died.
EW  Known only to survive in captivity.
CR  Extremely high risk of extinction in the wild.
EN  Very high risk of extinction in the wild.
VU  High risk of extinction in the wild.
NT  Close to being threatened in the near future.
LC  Widespread and abundant.
Industrial developers propose to clear-cut forests and strip mine approximately one-third of the western end of the island from Mayaguez to Utoado to mine lithium metal for use in cell phones.

A major highway will also be constructed that bisects the island to allow for the transport of lithium cargo to San Juan airport for overseas delivery.

Working as a team of wildlife biologists, answer the following questions below to help you decide to support or condemn further industrial development in Puerto Rico:

10. What is the name of your bird species?
_____________________________________

11. In which ecoregions does this species live?
_____________________________________

12. Describe the characteristics of these ecoregions.
_____________________________________

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13. What are the habitat needs of your bird species?

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____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

15. What is the IUCN classification of this species?
____________________________________________________________________

16. How would the proposed strip mine development change the ecoregion in which this species lives?
____________________________________________________________________
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17. Based on the habitat needs of your bird species, what impacts do you predict that the proposed strip mine would have on this species, and why?
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18. Do such impacts have the potential to move the bird into a higher IUCN risk category? Why or why not?

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19. If the impact is severe, are there alternatives to halting the mining development (such as another location on the island)?

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20. Can the bird population be safely relocated to another ecoregion to allow for such development? If so which one is compatible?

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____________________________________________________________________________________
Develop a Three-Minute Public Service Announcement for Puerto Rican officials to present your research.

- Choose a person in your group to narrate your presentation in Photo Story.
- Introduce your team of wildlife biologists.
- Use the camera to take pictures of yourself and your teammates to include in the presentation.
- Obtain screen shot photos of your bird from the Cornell website and include in Photo Story.
- Introduce the bird along with its habitat needs and ecoregions.
- State your final recommendation to advocate either for or against the industrial development project.
- Support your decision by discussing the impacts and how your group arrived at the decision.
- Discuss any alternative plans that may allow for any potential compromises.

Narrator’s Name (s):
________________________________________
________________________________________

Wildlife Biologist Team Members:
________________________________________
________________________________________
________________________________________

List Pictures and Proper Order:
1.____________________________________
2.____________________________________
3.____________________________________
4.____________________________________
5.____________________________________
6.____________________________________
7.____________________________________

Bird Species:
____________________________________

Habitat Needs:
____________________________________
____________________________________
____________________________________

Ecoregions in which this species lives:
____________________________________
____________________________________
____________________________________

Decision:
____________________________________
____________________________________

Alternatives (if any):
____________________________________
____________________________________
____________________________________