



Anna Savage: Conservation Scientist

Hunting for the Invisible Killer

Name: _____
 Period: _____
 Date: _____

Answer Key

Instructions: As you travel from site to site in Anna’s Google Earth tour, consider the following questions:

- Are there any consistent patterns in how Bd infection varies across seasons? What factor(s) might account for differences in these infection patterns between sites?

Yes, infection generally goes up in winter and down in summer. Change in temperature from season to season likely is the main factor accounting for this trend.

Students could also mention change in frog immune function or fungal biology over seasons. Both of these are possibilities that fundamentally relate back to temperature differences.

- Some sites have frogs with infection and disease. Other sites have frogs that are infected with Bd but show no signs of disease. What sites fall into each of these two categories?

Sites with frogs with Bd infection and mortality	Sites with frogs with Bd infection but no mortality
AC CIC MRBC TV WC	HR MRHS MRSS SM SS UH

- Why do you think some populations are diseased while others are not?

Likely possibilities include:

- *Genetic differences in the frogs living at the two types of sites*
- *Differences in environmental conditions such as temperature or moisture*

4. Two sites have shown no signs of Bd infection at any of the sampling dates. Which sites are these?

AS

HS

5. Why do you think the frogs in these two populations aren't infected with Bd?

Possible explanations include:

- a) *The Bd fungus has not been introduced to these two sites.*
- b) *Environmental conditions at these sites have protected the frogs from infection.*
- c) *Genetic resistance among frogs at these sites has protected them from Bd infection.*

6. Describe a way that you might be able to test your hypothesis.

Ways to test these hypotheses include:

- a) *Sample the environment to see if the fungus is present at each site.*
- b) *Look for environmental differences between infected and non-infected sites. Test the effect of factors such as temperature and moisture by exposing frogs in the lab to Bd under a range of conditions typically found in the field.*
- c) *Analyze DNA from frogs at sites AS and AH and compare with DNA of frogs at other sites, or...*
Test resistance to Bd by exposing uninfected frogs from both types of sites to this fungus in the lab under controlled environmental conditions.

7. What is the goal of Anna's research?

She is examining the frogs' DNA to learn whether some frog populations have evolved genetic resistance to the chytridiomycosis disease caused by the Bd fungus.

8. Why is this research important in terms of conservation?

The chytridiomycosis disease is causing decline in amphibian populations worldwide, in some cases even leading to extinction. If disease-resistant genes can be identified, this will help scientists to identify and breed frogs that are less likely to die after being exposed to the Bd fungus.