Name _____ **Period** _____

Chapter 38: Conservation Biology

Guided Reading Activities

Big idea: The loss of biodiversity

Answer the following questions as you read modules 38.1–38.6:

1. The three components of biodiversity include: economic diversity, species diversity, and genetic diversity.

2. Briefly contrast extirpation with extinction.
   Extirpation refers to the loss of one population of a species, whereas extinction refers to the loss of all individuals of a species.
3. Complete the following table, which compares the different kinds of diversity.

	Ecosystem	Species	Genetic
Description	The total of the world's natural ecosystems	The total of all of the world's different species	The total of all alleles for all genes within a population; this diversity is the pool from which microevolution draws when conditions change.
Example	Mojave Desert	California condors	A gene that confers resistance to a pest found in a wild variety of an economically important crop plant

4. True or false: The greatest threat to biodiversity is pollution from human activities. If false, make it a correct statement.
   False, the single greatest threat is from habitat loss.

5. Would a top-level predator be expected to have more or less of a pollutant in its body? Briefly explain your answer.
   It would be expected to have more of a pollutant in its body as a result of biological magnification.
6. Zebra mussels are a huge threat to native species of the Great Lakes. What type of threat is this?
   This is a threat from invasive species.

7. List three greenhouse gases.
   Carbon dioxide, methane gas, and nitrous oxide are three greenhouse gases.

8. True or false: The largest areas of temperature increases have been in the southern hemisphere. If false, make it a correct statement.
   False, they have been in the northern hemisphere.

9. What are the major sources of CO_2, N_2O, and CH_4?
   Livestock and landfills are responsible for the methane gas. Carbon dioxide and nitrous oxide come from the burning of fossil fuels.
10. Go to www.nature.org/greenliving/carboncalculator/ and calculate your carbon footprint. Record it here.

11. What are some steps you could take to reduce your carbon footprint?
    You could cut down on transportation emissions by carpooling or being more efficient when planning your trips. You could also cut down on home energy consumption by making sure your home is insulated and turning off lights in rooms that no one is in.
12. What are some ways in which the earlier arrival of spring, as a result of climate change, has negatively affected ecosystems?
    This can affect the precise timing that certain organisms rely on for specific events. One example is the pollination of plants by insects.
13. The ability to change phenotype in response to environmental cues is known as phenotypic plasticity.

14. Would a population of organisms that exhibits r-selection be more or less likely to exhibit phenotypic plasticity?
    Organisms that belong to an r-selected species would be more likely to exhibit phenotypic plasticity.

Big idea: Conservation biology and restoration ecology

Answer the following questions as you read modules 38.7–38.13:

1. Briefly explain why the bottleneck effect is a real concern in captive breeding programs.
   It significantly reduces the genetic diversity of the breeding population.

2. True or false: Conservation biologists know that some species cannot be saved and should focus on keystone species instead. If false, make it a correct statement.
   True

3. What is the relationship between an ecosystem and a landscape?
   An ecosystem is part of a larger landscape; a landscape may contain several distinct ecosystems.

4. The study of the dynamics and structure of a collection of ecosystems is known as landscape ecology.

5. Are there any biological hot spots in the United States? If so, where are they? Refer to Figure 38.9A on page 772 in your textbook.
   Yes, California has a large area of biodiversity hot spots.

6. A population of birds is found only on a small island off the coast of Australia. How might you describe this species?
   This species would be considered an endemic species.

7. What is meant by the term *ecotourism*?
   It refers to a practice that involves local human populations focusing on using tourism to make money rather than exploiting the natural resources.
8. How might ecotourism benefit local human populations?
   It would produce money and jobs and also promote a more sustainable type of living.

9. How did the loss of wolves in the Yellowstone National Park region have a cascading effect on the landscape?
   The loss of wolves led to an increase in the populations of herbivores. This increased the grazing done by these animals, especially along river and stream banks. This in turn led to a loss of lush riparian areas along river banks due to overgrazing.
10. What happened to the ecosystem as wolves were reintroduced to the Yellowstone National Park region in 1995?
    The ecosystem began to stabilize and return to a natural balance. Plant diversity along river edges began to recover.
11. The application of ecological principles in order to return a degraded ecosystem to its natural state is known as restoration ecology.

12. True or false: Sunflowers can be planted in areas where there are high levels of toxic metal pollutants because they can actually remove them from the soil and store them in their bodies. If false, make it a correct statement.
    True

13. Briefly explain why biological education of the human population is critical to conservation efforts.
    People need to be educated about the destructive practices that humans, as a population, currently practice. Our futures depend on our ability to manage our current natural resources appropriately.

CONNECTING THE BIG IDEAS

Use your knowledge of the information contained within this chapter's "Big Ideas" to answer this question.

Is there a link between reintroducing gray wolves into Yellowstone National Park and forest sustainability in Yellowstone?

