

CHAPTER 18

MULTIPLE-CHOICE QUESTIONS

1. Which is a cause of declining global biodiversity?
 - I Pollution
 - II Habitat loss
 - III Overharvesting
 - (a) I
 - (b) I and II
 - (c) I and III
 - (d) II and III
 - (e) I, II, and III**
2. Which statement about global biodiversity is *correct*?
 - (a) Species diversity is decreasing but genetic diversity is increasing.
 - (b) Species diversity is decreasing and genetic diversity is decreasing.**
 - (c) Species diversity is increasing but genetic diversity is decreasing.
 - (d) Declines in genetic diversity are occurring in wild plants but not in crop plants.
 - (e) Declines in genetic diversity are occurring in crop plants but not in wild plants.
3. Which group of animals is declining in species diversity around the world?
 - I. Fish and amphibians
 - II. Birds and reptiles
 - III. Mammals
 - (a) I
 - (b) I and II
 - (c) I and III
 - (d) II and III
 - (e) I, II, and III**
4. Which of the following species was historically overharvested?
 - (a) Brown-headed cowbird
 - (b) Honeybees
 - (c) Kudzu vine
 - (d) Dodo bird**
 - (e) Zebra mussel
5. Which statement is *incorrect* regarding the genetic diversity of livestock?
 - (a) The use of only the most productive breeds improves genetic diversity.**
 - (b) Livestock come from very few species.
 - (c) The genetic diversity of livestock has declined during the past century.
 - (d) Different breeds are adapted to different climatic conditions.
 - (e) Different breeds are adapted to different diseases.
6. Which statement is *incorrect* about invasive alien species?
 - (a) Their populations grow rapidly.
 - (b) They often have no major predators or herbivores.
 - (c) They are often competitively inferior.**
 - (d) A well-known invasive alien plant is the kudzu vine.
 - (e) A well-known invasive alien animal is the zebra mussel.
7. Which is an example of the single-species approach to conservation?
 - I. The Endangered Species Act
 - II. The Marine Mammal Protection Act

III. The Biosphere Reserve

- (a) I
- (b) I and II**
- (c) I and III
- (d) II and III
- (e) I, II, and III

8. Which principle of island biogeography is *incorrectly* applied to protecting areas of land or water?

- (a) A larger protected area should contain more species.
- (b) Protected areas that are closer to each other should contain more species.
- (c) National parks can be thought of as islands of biodiversity.
- (d) A larger protected area will have fewer habitats.**
- (e) Marine reserves can be thought of as islands of biodiversity.

9. Which statement *correctly* reflects the idea of a biosphere reserve?

- (a) Sustainable agriculture and tourism are permitted in different zones.**
- (b) Human activities are allowed throughout the reserve.
- (c) Human activities are restricted to the central core of the reserve.
- (d) No human activities are permitted in a biosphere reserve.
- (e) Sustainable agriculture is permitted, but tourism is not.

10. Which statement is *correct* regarding swapping debt for nature?

- (a) Protecting land and water is typically not expensive.
- (b) Developing countries can pay part of their debt by investing in their own environment.**
- (c) Developing countries pay their debt to the United States by investing in U.S. national parks.
- (d) Having a plan to improve the economy of a developing country is not important.
- (e) The only expense of protecting biodiversity is the purchase of an area.

FREE-RESPONSE QUESTIONS

1. The conservation of biodiversity is an international problem.

- (a) Name and describe one U.S. law that is intended to prevent the extinction of species. (4 points)

The Endangered Species Act was enacted in 1973 and forbids government and private citizens from taking actions that would destroy endangered species or their habitats. It also prohibits trade in products made from these species.

Another example is the Marine Mammal Protection Act of 1972 that forbids the killing of marine mammals or the import of their body parts.

- (b) Name and describe one international treaty that is intended to prevent the extinction of species. (4 points)

The United Nations Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) controls the international trade of threatened plants and animals.

- (c) Explain the benefits of taking an ecosystem approach, as opposed to a single-species approach, to conserving biodiversity. (2 points)

The ecosystem approach sets aside protected areas as a means of conserving biodiversity. Factors to be considered are size, shape, and connectedness to other protected areas.

Single-species approaches are focused on increasing the abundance of a particular species but these efforts often do not protect the entire biodiversity found in an ecosystem.

2. Tropical rainforests are home to a tremendous diversity of species. As a result, you need to develop

a plan to protect this diversity.

- (a) Describe the advantages and disadvantages of protecting a single large area versus several small areas. (2 points)

The advantage of protecting a single large area is that the area will have more species because they support larger populations of each species, which makes them less susceptible to extinction. Larger areas also contain more species because they typically contain more habitats and, therefore, provide a wider range of niches for different species to occupy. A disadvantage of protecting a single large area is that an event such as a disease or natural disaster could eliminate all individuals in the area.

- (b) How might increasing the amount of edge habitat affect species that typically live deep in the forest? (3 points)

Increasing the amount of edge habitat will affect species that live deep in the forest

because some animals that thrive in the edge habitat can have detrimental effects on species living deep in the forest.

- (c) Discuss the merits of preserving individual species that are threatened and endangered versus preserving the function of the ecosystem. (3 points)

The merit of protecting a single species is that when a species declines, the natural response is to encourage a population rebound by improving its conditions. This improvement can include providing additional habitat or reducing the presence of a contaminant that is causing impaired reproduction. By protecting the habitat for the single species, you protect the entire ecosystem as well.

- (d) Describe three characteristics of organisms that would make them particularly vulnerable to extinction. (2 points)
- i) Low reproduction rate (panda, polar bear)
 - ii) Specialized feeding habits (black-footed ferret eats only prairie dogs)
 - iii) Feeds at high trophic levels (tiger)
 - iv) Large size (rhino, various species of whales)
 - v) Limited or specialized nesting or breeding areas (red-cockaded woodpecker)
 - vi) Found in only one place (elephant seal)

MEASURING YOUR IMPACT

How large is your home? One of the major worldwide threats to biodiversity is habitat loss, including the loss of forests as the result of logging. Given that the demand for lumber drives much of the market for logging, consider how you and your family might influence the demand for lumber.

- (a) From 1970 to 2010, the average size of a house in the United States has doubled while the average size of a family has been reduced by half. Based on this information, how much more space per person does a modern house have?

The average person has 4 times as much space in 2010 as in 1970.

(b) The average house today uses the lumber from 50 trees. If homes were built to be half the size, and there are approximately 400,000 new homes built each year, how many trees could be saved?

Today: 50 trees per house \times 400,000 new homes = 20,000,000 trees.

If homes were reduced in size to being half as big, we would use 1/2 as many trees. So instead of 20,000,000, we would use 10,000,000 trees ($20,000,000/2 = 10,000,000$).

(c) Rather than demolishing an older house and building a new one, many homeowners have chosen to move an older house to a new location. This effectively recycles the older house. There are currently 50,000 homes moved annually. Assuming that the average house uses the lumber from 50 trees, how many trees are saved when houses are moved rather than demolished?

50,000 homes moved \times 50 trees per house that are not used = 2,500,000 trees saved