

EEB 2208 (Introduction to Conservation Biology)

Sample Test Answers: Lectures 6-10

In each case, the letter A indicates that the statement is correct, and a B indicates that it is not. I have included some notes (in red) to explain my thinking when designing each question.

Why did heath hens go extinct?

1. Because no land was protected for them. **B**
2. Because their habitat was destroyed. **A**
3. Because they are a long-lived species, with high reproductive rates. **B**
4. Because a harsh winter killed many individuals. **A**
5. Because they were hunted. **A**

Answering this question correctly is mostly a matter of knowing the story. Even if you don't know the story, though, you should be able to use the information in class to infer that Q2 is correct (because most species are affected by habitat loss), that Q3 is wrong (because long-lived species usually don't have high reproductive rates), and – if you know that a heath hen is a grouse – that Q5 is right (because large vertebrates are often adversely affected by hunted). In other words, an understanding of the basic concepts surrounding extinction risk should get you a passing grade, but knowledge of specifics would be needed to raise that to a higher grade.

A recent study by Koh et al. described patterns of co-extinction. Which of the following results arose from that study?

6. Many symbiotic species are vulnerable to extinction. **A**
7. Most future extinctions are likely to be due to co-extinctions. **B**
8. The risk of co-extinctions is far less serious than previously thought. **B**
9. The extinction of currently endangered species will result in 1000s of co-extinctions. **A**
10. In the past 100 years, millions of species have gone extinct because their host species have gone extinct. **B**

Q7 was quite hard because there will be a lot of co-extinctions in the future...but certainly not "most". In the example I gave in class, the number of predicted co-extinctions was a lot less than the number of host species known to have gone extinct. Based on that result, the number of co-extinctions is expected to be less than half of all future extinctions (about 30-40% if you do the math, based on the example). Although Q10 related to co-extinctions, it was designed primarily to determine whether you know the approximate number of extinctions in recent times. Given that the current estimate of the number of species on the planet is only 5-10 million, it is very unlikely that millions of species could have gone extinct in the past 100 years. If you then limit things further by focusing only on co-extinctions, then it is even less likely. The remaining questions should be straightforward if you have learned the material presented in class.

Which of these statements about habitat loss are true?

11. The area of tropical rainforest destroyed each year is about the same as the area of Connecticut. **B**
12. About half of the wetland habitat in the U.S. (excluding Alaska) has been lost in the last two centuries. **A**
13. Most habitat loss is caused by urban development. **B**
14. Well over half the coral reef habitat in the world has been lost or severely damaged. **B**
15. Habitat loss and degradation affects more endangered species in the US than any other threat. **A**

This set of questions was primarily designed to test whether you have a general idea of the magnitude of habitat losses. For Q11, it is sixteen times the area of CT; for Q13, most loss is due to agriculture (if you think about it, relatively little of the world's land is actually urban); for Q14, it is <30%.

Which of the following statements correctly link a species with the factors that threaten it? (5 points)

16. Sea turtles are threatened because they are poor dispersers. **B**
17. Red-cockaded woodpeckers are threatened because they require specific habitat conditions that are rare. **A**
18. Large blue butterflies are threatened because they are extreme habitat specialists. **A**
19. Flattened musk turtles are threatened because they hybridize with other turtle species. **B**
20. Vultures are threatened by overuse of painkillers in farming. **A**

Mostly, knowing these examples is simply a matter of being in class. Q16 is one you could probably guess, but the others require that you know the specific examples I talked about.

Which of the following statements about over-harvest are true?

21. Species with high reproductive rates are most vulnerable to over-harvest. **B**
22. Over-harvest tends to affect plants more than animals. **B**
23. Bush-meat is exported from Africa for profit. **A**
24. Many marine species are threatened by over-harvest even though they have no commercial value. **A**
25. The annual harvest of millions of mourning doves is sustainable. **A**

This set was also fairly straightforward and designed to test your factual knowledge. Q24 is correct because of the effects of by-catch.

Why are there more endangered species in Hawaii than in California? (5 points)

26. Hawaii has more large species than California. **B**
27. Hawaiian species have more complex life-histories than Californian species. **B**
28. Hawaii is a group of remote islands. **A**
29. Humans have destroyed more habitat in Hawaii than in California. **B**
30. Introduced predators have a bigger impact on island species than on mainland species. **A**

There is no reason to believe that Q26, 27, or 29 are correct, although if they were they could account for the difference. On the other hand, species on remote islands are known to be more vulnerable (several examples given in class), and introduced predators on islands are well known to increase extinction rates (again, discussed in class).

31. In 1998, Wilcove et al. published a summary of the different threats faced by endangered species in the U.S. Describe the relative importance of the different threats they considered, and compare the results for vertebrates, invertebrates, and plants. (6 points)

This answer would get all 6 points: Habitat loss is the greatest threat for all three groups, affecting the majority of endangered species. Alien species and pollution each affect a large proportion of endangered species; about half in some taxonomic groups in each case. Invertebrates tend to be affected less by alien species, however, and few plants are affected by pollution. Over-exploitation affects about a quarter of both animal groups, but a much smaller proportion of endangered plant species. Finally disease affects about 1 in 10 vertebrate species, but very few invertebrate or plant species. Some of the differences among taxonomic groups, however, could arise from biases in existing knowledge. E.g., the low number of endangered invertebrates affected by disease may just reflect a lack of research on invertebrate diseases.

32. Define the following terms. (4 points)

Trophic cascade: See Myers et al. This term refers to the way in which effects on species at the top of a food chain can have major repercussions for species further down the food chain.

Extinction debt: See Hahs et al. This term refers to extinctions that have not yet happened but are expected to occur in the future as a result of habitat loss/degradation that has already happened.

Note that I will not ask about minor details in the discussion papers, but these first two terms are fundamental to understanding the papers that they came from, and we specifically talked about their meaning in class – hence I consider them to be terms you should know.

Genetic bottleneck: See notes on causes of population decline. This term refers to a situation where a population has been reduced to a very small size at some point in its past. Usually, this population reduction results in a loss of genetic diversity.

Symbiotic: See notes on patterns of extinction. Symbiotic species are those that have a close interactive relationship with another species. Frequently, they rely on that other species to survive, and this is the context in which I've talked about them in class.

33. Give four ways in which roads negatively affect species. (4 points)

See notes for Lecture 8.