EEB 2208 (Introduction to Conservation Biology)

Homework 3: Lectures 1-6

Homework checklist

- Answer every question or you will get no points
- Submit your responses before midnight on the day they are due or you will get no points
- Submit your answers via huskyct, following the instructions in the "Homework overview" document. Do not put your answers in the "Comments" box, or you will get no points.
- If you write your homework in Word and then copy & paste into HuskyCT, make sure you are not using Word's auto-numbering, otherwise all the question numbers will disappear when the homework is submitted (and you will get no points).
- Be sure to use the format explained in class and for Homework 1. Each numbered item is a separate question and would be worth 1 point on an exam.
- A = true, B = false

For the following sets of questions identify which answers are correct and which are false.

Using only Figure 3 in Hahs et al. (in the exam I would give you the figure and the legend), which of the following statements is correct?

1. The oldest cities have the highest extinction rates.
2. Extinction debt is lowest for Type III cities.
3. The number of extinctions is lowest for Type III cities.
4. Extensive transformation after 1600 is associated with relatively high extinction rates.
5. The youngest cities have highly variable extinction rates.

How does the current rate of extinction compare to the background rate? (5 points)

6. They are about the same.
7. Both are estimated to be greater than 10,000 species/year.
8. The current rate might be as much as ten thousand times greater than the background rate.
9. The current rate is estimated to be about 100-1000 times greater than the background rate.
10. Comparisons between the two numbers are meaningless.

Which of the following statements about extinction are correct?

11. Mass extinctions have been very common throughout geological time.
12. Extinction rates were far higher during past mass extinctions than they are today.
13. Extinction is a natural process.
14. Extinction rates in marine species are much higher than for terrestrial species.
15. Extinction rates in birds are very similar to all other groups.

The graph below illustrates the relationship described by the equation $S = c \ast A^z$, which I discussed in class. Which of the following statements about this figure and equation are correct?
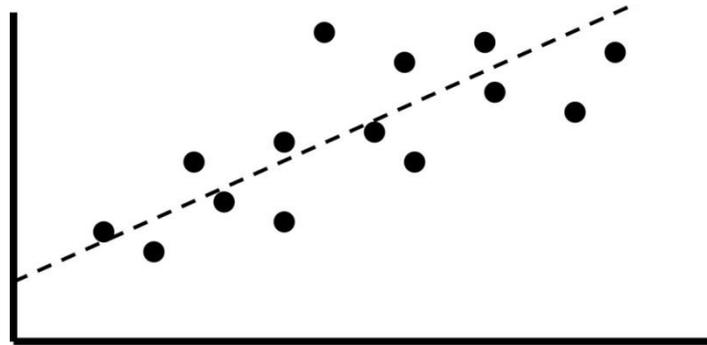
16. The "A" in the equation refers to Area, which increases from left to right.
17. The "S", "c" and "z" in the equation are all constants.
18. The equation and graph represent the change in species richness across a series of islands of different sizes.
19. Each dot on the graph represents a different species.
20. The figure shows the relationship described by the equation after taking logs.

Which of the following statements about extinction are correct?

21. A good way to define extinction is that a species has not been detected for 50 years.
22. The term extinction debt refers to extinctions that are expected to happen due to past actions.
23. In the Singapore extinction study discussed in class, extinctions rates were uniformly high across habitats and taxonomic groups.
24. One way to determine whether a species is likely to be extant is to look at the length of the time gaps between past sightings.
25. Because of extinction debt, scientists have suggested that only about half of the extinctions that will ultimately be caused by habitat losses will occur within the first 50 years.

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

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

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

31. Many symbiotic species are vulnerable to extinction.
32. Most future extinctions are likely to be due to co-extinctions.
33. The risk of co-extinctions is far less serious than previously thought.
34. The extinction of currently endangered species will result in 1000s of co-extinctions.
35. In the past 100 years, millions of species have gone extinct because their host species have gone extinct.

PART 2:

36. Define the following terms. Give examples of (a), (b) and (c), and explain how (d) is different from species evenness. (8 points)

a) Endemic species:

b) Extinct in the wild:

c) Symbiotic:

d) Species richness:

37. Explain how the equation and graph given for Q16-20 (above) could be used to estimate how many species will go extinct following the loss of 50% of the world's coral reef habitat. Include in your explanation the pieces of information that would be required to do this calculation. (3 points)

38. List 4 factors that make species vulnerable to extinction. Give a specific example for each. (4 points)