

Read each question carefully and don't hesitate to ask if a question seems unclear. If possible, answer each question in the space provided, but if needed, continue on the back. If you use a drawing as part of your answer, be sure to also include a written explanation. These questions have specific answers, although for some, more than one answer is possible. To receive full credit you must clearly and fully answer the question being asked. The points for each question are noted in parentheses totaling 103 points.

1. In both male and female kestrels (a species of bird) having more offspring reduced survivorship. Based on this data, are kestrels monogamous? Explain. (5 pts)

Yes, since the survivorship affects both males and females, then they both must be helping care for the offspring.

2. Under what condition would a female be more likely to reproduce with an individual that is not her mate? Why? (10 pts)

Any of: When she has not been able to reproduce with her mate. When increased genetic diversity would be advantageous. If she is incompatible with her mate. When her mate is too similar to her.

3. What can be inferred about an area with high biodiversity? (5 pts)

There are plentiful resources.

4. You are studying life on Mars. You find 1 million vuuxes, 300,000 googoos, and 500 meekers. What can you infer about the relationship between these organisms? Explain. (10 pts)

The order that they appear in the food chain are: vuuxes then googoos, then meekers. Resources are lost as they move through each trophic level. Typically there are fewer higher consumers than lower level consumer or producers.

5. What do the tools found along with the *H. floresiensis* skeletons tell us about them, and why is this finding surprising? (5 pts)

They were intelligent. That is surprising given their relatively small brains.

6. On the island of Flores, skeletons of pygmy elephants and the proposed small human relative, *H. floresiensis* have been found. Other than an island, where would you expect to find small versions of a species? Why? (10 pts)

Wherever resources are scarce. A desert, etc.

7. Would an invasive consumer at the bottom of a food chain (a primary consumer) or an invasive consumer at the top of a food chain have a greater affect on the overall ecosystem? Why? (10 pts)

Either. Invasive primary consumers affect the producer, and the producers are providing the basis for the whole food chain. OR Invasive higher consumer by over-consuming the level below them can have a ripple affect all of the way down to the producers, such as the killer whale, sea otter, urchin, kelp example.

8. What has happened around Chernobyl since the accident that shows that in this area humans were competing with other organisms for resources before the accident? (10 pts)

Both biodiversity and the number of individuals are up (either answer is fine).

9. If you were not able to get data about cancer rates near Chernobyl before the accident, how could you still study the affect of the accident on cancer rates near Chernobyl since the accident? (10 pts)

You could look at cancer rates in similar areas to see if there was a difference. This is what researchers are doing for the animals and plants.

10. After a very destructive disturbance (like a fire), would you expect plants or animals to be the first organisms to colonize the disturbed area? Why? (10 pts)

Plants. They are the producers and serve as the basis for the food chain.

11. You are studying the number of deer that live in Travis County, and you notice a significant decrease in the number of deer. Give **two** hypotheses for this decrease in deer population. (5 pts)

Any two of: Increased competition. Increased predator. Decreased resources.

12. From the lecture on the reintroduction of wolves to Yellowstone NP, what question was tested by these figures, and what was the answer? (10 pts)

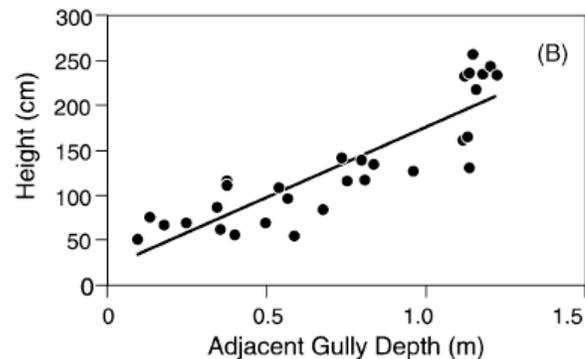
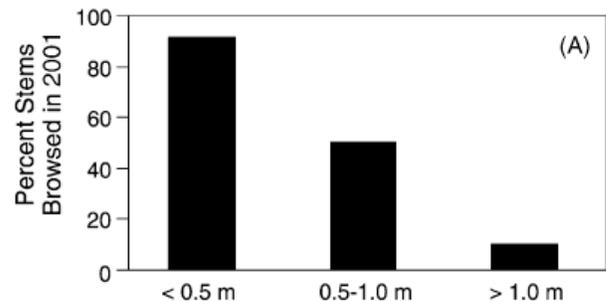
Question: (either)

Did wolves cause the increased plant growth?

Are wolves altering elk behavior?

Answer:

Yes. Changes were only seen in the deeper gullies.



Bonus: Based on what we know about modern humans, do you think that our ancestors of 5,000 years ago were socially monogamous, sexually monogamous, or non-monogamous? Why? (3 pts)

Any of: Sexually monogamous- if this is common behavior today, the genetic component of this behavior may have been passed on from then to now. Socially monogamous- if this is common

behavior today, the genetic component of this behavior may have been passed on from then to now.

Non-monogamous- this behavior most closely matches our current behavior, plus it appears that human males have behaviors, sperm competition that meant females were reproducing with multiple males. Also, the wide range of human genetic diversity might be a result on non-monogamy or social monogamy.