

Exam #4 April 23, 2008

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. Would eating significantly less food extend the life of a grizzly bear? Why or why not? (10 pts)
No, the grizzly needs to store excess energy so that it can survive its winter sleep. Less food would decrease the likelihood of surviving the winter sleep.

2. Would you expect a carnivore or an herbivore to have a larger stomach? Why? (10 pts)
Carnivore- food will only be available at certain times, so it needs more space to store the occasionally available food.

OR

Herbivore- some herbivores have stomachs that act as fermentation tanks for cellulose digesting organisms. These herbivores have large stomachs for the fermentation to take place.

3. What nutrient that you eat is critical for the transport of oxygen in your body? What is the connection between this nutrient and oxygen transport? (10 pts)
Either protein/amino acids to make hemoglobin, or iron to make hemoglobin. Hemoglobin binds to and transports oxygen around the body in the blood.

4. Would blood be more acidic in arteries or veins? Why? (10 pts)
Systemic veins- the blood has absorbed CO₂ from the cells and is therefore more acidic due to higher carbonic acid levels.

OR

Pulmonary arteries- CO₂, and therefore carbonic acid, are being delivered from the body and it is heading toward the lungs where it will be diffused out of the blood. After the lungs, in pulmonary veins the blood will be less acidic.

5. 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. (10 pts)
Any two of:

Decrease in resources such as water, nitrogen, etc. Increase in predators. Increased competition from another herbivore.

6. If there is 1 male grizzly bear for every 9 female grizzly bears, and this occurs over an extended period of time, what would you expect to happen to the ratio of male:female size? Why? (10 pts)
With so many females, the males do not need to compete for access to reproduction so the males would decrease in size due to less competition between males for the females.

7. Why would it be unusual to find a food chain with 10 levels of consumers? (10 pts)

Only about 10% of energy is passed on through each consumer. The farther from the producers a consumer is, the less energy that is available. There would need to be huge amounts of energy production to support 10 levels of consumers.

8. Of the resources that we discussed in class (water, carbon, nitrogen, oxygen, and space), describe how a terrestrial consumer could obtain **two** of these resources without relying on plants. (10 pts)

Any two of:

Water can be obtained directly. Oxygen is in the air. space could be underground or in rocks, etc.

9. We looked at an article which proposed that decreases in human density in rural areas will allow human disturbed areas (farms, villages, roads, etc) to recover and regain biodiversity. What is one problem with this idea? (10 pts)

Either: Decreased rural populations may still be able to extract resources with mechanization and technology. OR Many species cannot survive in disturbed areas, and it can take hundreds of years to recover from a disturbance, so the original organisms may not be around to repopulate the area.

10. 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)

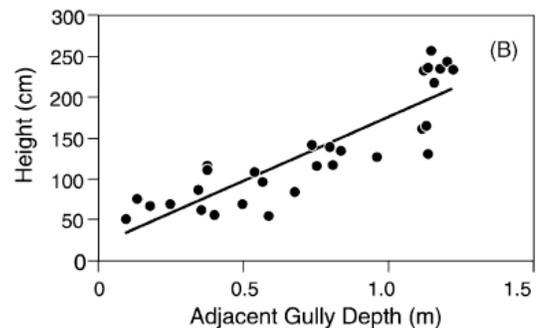
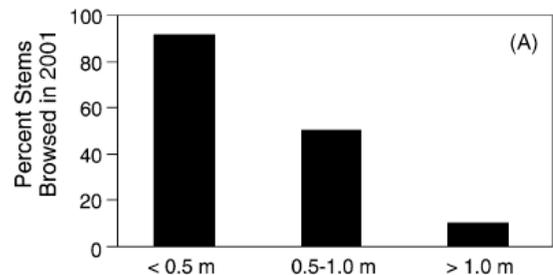
How have wolves affected elk behavior?

OR

Are wolves responsible for the improved riparian habitat?

Ans:

Elk are only avoiding the “high” risk areas, the deepest gullies. The “low” risk areas are still being heavily browsed.



Bonus: When trying to reintroduce grizzly bears to an ecosystem, would it be necessary to use a “soft” release similar to what was used on the wolves in Yellowstone NP? (3 pts)

No, grizzlies live by themselves, not in packs, and so they do not need to fear being in the wrong territory. The “soft” release was to allow the wolves to realize that they were not in another packs territory.