Dr. Reichler's Bio 301M Exam #2 March 6, 2009 Print Name: KEY

1. Island Mack is 100 km^2, and island Brown is 500 km^2. Island Mack has twice as many species as island Brown. Why is this surprising, and how is it possible? (10 pts)
Biodiversity is commonly positively correlated with area, but in this case island Mack must have more resources.

2. You are studying a herd of yak (primary consumers) that live in an area free from predators. Their population had been rapidly increasing, but then it began to decline. No new predator was introduced, and the climate has not significantly changed during this time. Why did the population of yak decline? (10 pts) *They increased to above their carrying capacity, and now the population is shrinking due to either a lack of resources, a build-up of waste, or both.*

3. A flood has severely altered a prairie habitat. A species of prairie dog that lives there has been reduced from over 3,000 individuals to just 45 individuals. The following year there are no more prairie dogs left. Give **two** possible explanations for why the prairie dogs went extinct. (10 pts)
The numbers are so low that they entered an extinction vortex. During succession the resources they need are not present.

4. On the island of Flores, you find that *H. sapiens* and *H. floresiensis* ate the same food, and that they coexisted on the same island for a long period of time? Why is this surprising, and what might explain this? (10 pts)
Prolonged competition between species is unusual. They may be using different niches, like living in different parts of the island.

5. In Chernobyl there is a large paved area that was part of an amusement park. Is the succession occurring in this paved lot more like primary or secondary succession? Why? (10 pts)
Primary, this area lacks soil, etc and most other biological resources.

6. A forest fire occurred in an area with a similar climate and similar biodiversity to the area around Chernobyl. In which circumstance would you expect the succession to take place more quickly? Why? (10 pts)
Forest fire. Forest fires release resources into the soil. Also, the area around Chernobyl is contaminated with radioactivity, and that decreases survival of the organisms that live there.

7. Both wolves and grizzly bears are secondary consumers. Would you expect to find more wolves or more grizzly bears in Yelowstone NP? Why? (15 pts)
Wolves. Each wolf is smaller, and therefore more wolves can exist in a given area using the same resources as fewer bears. OR Since wolves hunt as a pack they can kill more prey and would have more resources available to them.

8. This graph is from a study on plant heights in Yellowstone NP riparian habitats after wolves were reintroduced. Which graph represents **high** risk sites? Why? (15 pts)
B. this is where plant heights increase indicating that the elk re avoiding this area due to the increased risk of predation from wolves.

9. Why does this graph imply that the loss of biodiversity may begin to slow down? Would you expect to see a major recovery in biodiversity over the next 20 years? Why or why not? (10 pts)
Decreased rural populations may mean fewer resources will be extracted from these areas and disturbed areas can return to a wild state. Succession takes a long time, maybe 100+/- years, so major recoveries of biodiversity will occur farther in the future.

Bonus: Only **one** of the following questions will count: (3 pts)
a) There are two meadows: both 2 acres in size, both receiving 80 inches of rain evenly distributed over the course of a year. One has clover (a legume) and the other has only grasses (not legumes). Which is likely to have more species of herbivores? Why?
With legumes will have more nitrogen that may allow more primary consumers to exist.

b) Were you at the "fieldtrip" on Wednesday?