End-of-unit Thought Questions for the Biodiversity, Population Biology & Population Dynamics Unit

For instructors: these questions can be used as homework at the end of the unit or for additional exam questions.

1) Define *biodiversity* & explain how we measure it. In other words, what methods can be used. Use some specific terms we learned this week to explain the composition or balance of species in an environment. Feel free to use examples.

2) Why is biodiversity related to ecosystem health?

3) Why do we study populations?

4) Pick your favorite animal. How would you study its population? Pretend you can spend as much $ as you want and design new technologies if you need to.

Answer Key:

1) Define *biodiversity* & explain how we measure it. In other words, what methods can be used. Use some specific terms we learned this week to explain the composition or balance of species in an environment. Feel free to use examples.

Biodiversity refers to the variety of species or taxa or genes or ecosystems on earth. We can measure it lots of different ways depending on what our question is or what type of biodiversity we want to measure. Maybe we could count the number of different species present, or look under a microscope at a water sample to count all the microscopic organisms inside and classify them, or characterize ecosystems and then quantify how many different types of ecosystems there are or lastly, analyze the DNA within a variety of organisms to see how different the genetic make-up of individuals actually is. Biodiversity of species can also be called species richness. If there are an approximately equal number of individuals in each type of species in an area, this would mean this region shows higher species eveness.

2) Why is biodiversity related to ecosystem health?

The diversity of species is related to the diversity of roles the species serve in their ecosystem. Since most species are thought to play important roles in the ecosystem, a higher diversity of species causes a higher level of ecosystem function and health. When species are removed from a system, a crucial service may also be removed. Higher biodiversity conveys higher ecosystem resilience to buffer the system against dramatic change.

3) Why do we study populations?

We study populations because in order to protect something we must first understand it. In order to protect populations from going extinct, we need to know how high or low its abundance is, how much the population is growing or decreasing, what threats face the population and what habitat needs that population has. There are many human activities that interact or impact wildlife populations and often, these activities (eg. Fishing, logging, development etc) are managed by state or federal regulations and these regulations often necessitate monitoring both the human activities and the status of the wildlife population. By knowing both pieces we can attempt to have development and industry be productive while being environmentally responsible.