Review sheet for the material covered since exam III

WARNING: I have tried to be complete, but I may have missed something. You are responsible for *all* the material discussed in class. This is only a guide.

NOTE: the extra material I provided is *not* on this review sheet (you are *still* responsible for this).

1) Plant growth

What are annuals? Biennials? Perennials? How old can some plants get?

What is meristem? Where is it found? What is apical meristem? What is primary growth?

What is secondary growth? What is the role of meristem in secondary growth? What is vascular cambium? Cork cambium? How does a "tree" get thicker? What is the role of xylem? Phloem? What is cork? What are you looking at when you look at a cross section of a tree trunk?

What is heartwood? Sapwood? What are the rays found in wood? What is bark? How do tree rings form?

2) Plant (angiosperm) reproduction

Know all parts of the flower. Know which parts are male and which are female, and what the parts do. What is a complete flower?

How does fertilization take place?

How are sperm made? What is a generative cell? What is a tube cell? What is pollen? What is the role of meiosis in sperm formation? How is pollen distributed? What is the role of flowers in distributing pollen?

What is pollination (it is NOT fertilization)? Where is pollen deposited? What does the tube cell do now? The generative cell? What is the embryo sac?

What is the central cell? What happens to three of the spores that result from meiosis in the ovule? What is the embryo sac (yes, a repeat question)? What happens as the sperm enters the ovule? Why is this process called double fertilization? How many sets of chromosomes does the endosperm have?

How does the seed finally develop? What is the role of the zygote & endosperm? What is fruit? What is the role of the seed coat? What happens to the seeds?

How do seeds germinate? How is germination different in monocots and dicots? How is the shoot protected in monocots and dicots?

How important is asexual reproduction? What are some examples of asexual reproduction in plants? How important is this in agriculture?

3) Population ecology

What is ecology? What different aspects of ecology do biologists usually look at? How are these different?

What is a population? What is population density? How can we estimate the size of a population (hint: we usually can't count every individual)? What four factors cause changes to the size of a population?

What are dispersal patterns? Know the definitions of clumped, uniform & random.

How can a population grow? What could happen if a population grew without limits? What kind of growth model is this? What is the equation for this model (just know the basic equation, you don't need to know how to plug numbers into it)? What kind of a curve do we get with this kind of growth model?

Most important - why is this growth model totally unrealistic?

What is a more realistic growth model? What is the role of K in this model? What is K? Again, know the basic equation, but don't worry about being able to plug numbers into it. What is the name of this model? What kind of curve do we get?

What factors can affect K? What is the role of food, territory, weather, etc. in determining K?

Understand the lynx - hare example. Why do the numbers of lynx and hare keep going up and down? What are two possible explanations of this phenomenon?

What are life tables? Survivorship curves? What is the difference between types I, II, & III?

What is K - selection? r - selection? Why are humans generally considered to be K - selected and roaches r -selected? Why do we name these patters after r and K?

What is the main reason for the human population explosion? What is our current population size? Where might we be in 2050? What is a possible K for humans on the planet?

What is the problem with this? What impact does this have on our ecological resources?

What is meant by our ecological footprint? What would happen if every human consumed resources at the same rate that we do in the U.S.? Is this even possible?

What is doubling time? What country has the highest doubling time? What is the doubling time for the U.S.?

What are growth pyramids? What do they look like for a growing population? For one in decline? For a stable population?

Why is China's population still growing despite a 1 child / family policy that was instituted in 1979 (though not strictly enforced until later)?

4) Community ecology

What is species richness? Species diversity? How are they different? How do they contribute

to Biodiversity?

What is interspecific competition? How does the Barnacle example demonstrate competition? What is principle of competitive exclusion?

What is intraspecific competition? Why is this so important in agriculture?

What is a niche?

How does predation affect a community? Why might predation be a "good" thing (know the kelp example).

What other kinds of symbiotic relationships are there? Make sure you understand parasitism, commensalism and mutualism. Know some examples of each. Why did we say herbivory is essentially the same as predation?

What is disturbance? What happens as a result of disturbance? What is succession?

What are trophic levels? Why can't we support that many "top" carnivores? What are detritivores? Why is it more efficient to eat vegetables/fruits/grains rather than meat?

What are chemical cycles? (Just know what they are - we really didn't discuss these).

5) Conservation biology

What is conservation biology? Why would we want to conserve?

What are economic reasons for conserving? What are spiritual reasons for conserving? Ecological reasons? Make sure you know examples in each category (e.g., examples of food and medicine for economic, etc.).

Why do we need to be aware of social issues when we try to conserve something? What might different societies think about the same animal (e.g., snakes or dogs)? Why does this impact conservation efforts? What can be done to change people's minds?

What is habitat destruction? How does urbanization contribute? What is deforestation? Why is this a particular problem in the tropics? How much rainforest are we loosing every year? What is desertification? What causes it? How are wetlands being lost?

What is overexploitation? What happened to the cod? Mediterranean forests? Be familiar with some animals that are particularly affected or have gone extinct.

What problems do introduced species cause? How/why are species introduced? What can be done about introduced species?

What environmental factors are there that affect the environment? (We only talked about a very few of the more important ones). What kinds of pollution are there? What is the problem with ozone? Acid rain? Carbon dioxide? Pesticides?

What is the fundamental driving force behind most of the above problems? Are there any solutions? Understand that proposed solutions become political very quickly (it should be

obvious why).

How can we help conserve a species? Why does understanding the life history of the animal/plant help? What role does legislation play? What about controlling predators? Can we manage wild areas? What is the role of zoos? Reserves?

Finally, understand the example of the Nairobi National Park as described in class. Make sure you understand the both the benefits of the park and problems this park is having.