

Ecology/Ethology Problem Set

Many factors help determine the ecological diversity of an environment. Consider an old growth forest that in recent years has been maintained as National Park. Select all the true statements below that will lead to increased ecological diversity.

- A. By allowing fires to burn in forest as opposed to putting fires immediately in the forest diversity will be reduced.
- B. The advent of exotic animals will decrease diversity.
- C. Suppose that wolves are a keystone predator in this environment. The removal of wolves would then increase diversity.
- D. Fragmenting the forest will decrease diversity.

Many anthropogenic gases are contributing to global warming. Indicate the relative greenhouse gas contribution of each of the following anthropogenic gases per molecule.

- I. Nitrous Oxide
- II. CFCs
- III. Carbon Dioxide
- IV. Methane

- A. II>I>IV>III
- B. III>II>I>IV
- C. IV>III>I>IV
- D. IV>II>I>III

Match the description of each of the following biomes to the name of biome.

- A. Savannah
- B. Wetland
- C. Chaparral
- D. Grassland
- E. Mangrove Swamps

This biome has a distinct dry and wet season, with plants adapted to long periods of drought. The temperature year-round is often very high.

The biome has very cold winters that are very dry. The biomass in the biome is often very high, with some plants surviving for over 10,000 years.

This biome has a wet winters and dry summers. Plants in this area often have many spines.

This biome is incredibly high productivity. This biome is often used as a purifier of water supplies.

This biome is characterized by brackish waters and is often very productive.

Oftentimes in ecology, we see a lot pyramids, pyramids of biomass, species, and standing crop. However in rare occurrences we also see inversion of these pyramids. Match each of pyramid inversions with the correct biome

- A. Savannah
- B. Wetland
- C. Pelagic Ocean
- D. Deciduous Forest

This biome often has a inverted species pyramid.

This biome often has a inverted biomass pyramid.

Bees famously use dances to communicate with other bees where the location of possible food as famously observed by van Frisch. Select all the correct statements below.

- A. The round dance is used for food sources that are very close.
- B. The farther the straight walk the farther the food source
- C. The angle of the waggle dance indicates the angle from the sun
- D. Bees use visual communication to see each other dances.

Select all the following studies that are ethological studies.

- A. Pandas playing around in their environment at the zoo.
- B. The behavior of deer after human construction on their home habitat.
- C. Sharks behavior in response to human fishing.
- D. The behavior of penguins in Artic.

Ethologists can often determine the mating system between animals by observing their morphological features. Select all the true statements.

- A. If a specie species are monogamous, both male and females are often around the same size.
- B. In polyandry, the female is often highly ornamented
- C. In polygamy, the female is often highly ornamented
- D. Most birds are monogamous

Many creatures have different types of population curves. Indicate what type of population curve each of the following creature practices.

- I. Type I Population Curve
- II. Type II Population Curve
- III. Type III Population Curve

- A. Plants
- B. Corals
- C. Humans
- D. Large Fish
- E. Small mammals