**APES- Unit #3 Study Guide**

***Species Interactions and Community Ecology***

Name: Brandon Tran

1: What makes the Zebra Mussel an **invasive species**?

It has no natural predators, competitors, or parasites, and they eat phytoplankton and zooplankton.

2: Define the following *species interactions:*

**\* Competition:**

When multiple organisms seek the same limited resources in order to survive. Both species harmed

**\* Predation, Parasitism, and Herbivory:**

Process by which individuals of one species (predators) capture, kill and consume individuals of other species (prey); Relationship in which one organism (parasite) depends on another (host) for nourishment or some benefit; Exploitation in which animals feed on the tissues of plants. Only one species benefits

**\* Mutualism:**

Symbiosis in which organisms live in close contact, and pollination where bees, bats, birds, and others transfer pollen from one flower to another, fertilizing eggs. Both species benefit

3: What are some of the *resources* that species compete for in competition?

Food, water, space, shelter, mates, and sunlight.

4: Define **Competitive Exclusion:**

When one species completely excludes another species from using a resource.

5: What must happen for species to co-exist?

Species must include and share all resources with one another.

6: What is the difference between **fundamental** and **realized niche**? *Explain why a species wouldn’t fulfill its fundamental niche?*

A fundamental niche is when an individual fulfills its entire rose by using all the available resources. The realized niche is the portion that is actually filled by the individual’s use of resources, which is usually limited by other individuals looking to fill their portion as well.

A fundamental niche cannot be filled because, as explained above, other individuals prevent others from filling it because they are trying to fill their fundamental niche themselves.

7: Give an example of **resource partitioning:**

An example of resource partitioning (dividing resources by different ways that don’t conflict) is 2 species that hunt the same food, one during the day, and one during the night. Because their hunting schedule does not conflict and the resources are shared, they are partitioning resources.

8: How does **character displacement** help with competition?

Character displacement helps competition in organisms by giving the species a specialized characteristic that helps them acquire the resource.

9: Explain how **predator and prey** populations depend on each other:

Predators and their prey both depend on each other because both populations eventually enter a period of equilibrium – a period where both species shift back and forth according to populations. For example, if the predator population is low, prey populations will skyrocket because there are fewer predators to feed on them. Because prey levels are increased, predator levels will increase because of the abundance of food. This rollercoaster effect will continue until either one is somehow disrupted.

10: How does **Natural Selection** strengthen population ***“fitness”***?

Natural selection narrows species development into adaptations that are suited for hunting specific animals. This strengthens population “fitness” because acquiring food becomes easier and more efficient.

11: *Define the following:*

**\* Cryptic Coloration:**

The coloration of an animal, which serves as a camouflage for certain surfaces.

**\* Warning Coloration:**

A bold color that alerts predators, usually present in toxic animals.

**\* Mimicry:**

A form of camouflage. When an organism evolves into a form that resembles a certain pattern, organism, or terrain.

12: Define **Parasitism:**

When an organism depends on an animal host for survival. This relationship usually degrades the host.

13: What is the idea of ***“coevolution”***?

The idea of coevolution is when hosts and parasites become locked in a duel of escalating adaptations, such as when the host develops an adaptation to counter the parasite, and vice versa.

14: What are some *plant adaptations* that help to protect plants against herbivory?

Some adaptations plants possess to prevent herbivory are toxic or distasteful chemicals, physical protection such as thorns, and organism relationships where an animal defends the plant.

15: Explain how *pollination is a form of mutualism:*

Pollination provides benefits for both parties. In exchange for the pollination of the plant, the plant offers its nectar to feed the animal responsible for the pollination of the plants.

16: *Define the following:*

\* **Allelopathy:**

When certain plants release harmful chemicals.

\* **Commensalism:**

A relationship in which one organism benefits, while the other remains unaffected.

\* **Facilitation:**

When an organism provides conditions that allow another organism of the same species to grow or develop, such as plants providing shade to allow seedlings to grow.

17: What is a **community** of organisms?

An assemblage of species that live in the same place at the same time.

18: Draw a trophic level pyramid with the following *terms/definitions (examples)* below:

**Autotrophs,** **Primary Consumers, Secondary Consumers, Tertiary Consumers, Omnivores, Detritivores, Decomposers**

Detritivores

Decomposers

----------------------------------------------

Omnivores

---------------------------------------------------------

Tertiary Consumers

-------------------------------------------------------------------

Secondary Consumers

------------------------------------------------------------------------------

Primary Consumers

----------------------------------------------------------------------------------------

Autotrophs

19: How is *most energy* lost in an ecosystem?

Energy is usually lost through waste, heat, and respiration.

20: Explain why this statement is true: *“ A human vegetarian’s ecological footprint is smaller than a meat-eater’s footprint.”*

In order to be a meat eater, a person must consume from the higher points of the trophic level pyramid. The energy loss explained in 19 is a huge amount in this level, so quite a bit of energy was used to nourish the animal that is being consumed. This energy loss and the need to replenish it is why vegetarians, who eat lower in the pyramid, have a smaller footprint.

21: What is the difference between a **food chain** and a **food web**?

A food chain shows a simple representation of energy being transferred up trophic levels. A food web displays energy transfer as well as the relationships between organisms in their trophic levels.

22: What is a **keystone species** and what happens to an ecosystem when it *gets removed*?

A keystone species is a species that has a major role or impact on the ecosystem, despite its usually small numbers. If a keystone species is removed, the food chain will alter and populations will deviate from their normal levels.

23: What is a **trophic cascade**? *Why is it important?*

A trophic cascade is when high trophic level organisms indirectly influence low trophic level populations by regulating the level of mid level species. This is important because an overabundance in both of these mid and low level species could lead to ecosystem problems such as overgrazed vegetation and weakened habitat structure.

24: Communities of organisms respond to disturbances differently. Explain r**esistance and resilience.**

Resistance is when organisms resist change caused by a disturbance. Resilience, on the other hand, is how a community reacts and changes in response to a disturbance.

25: What is an ***invasive species?*** How do we control a species that has become invasive? *(Name several ways)*

An invasive species is a group of non-native organisms that spread and dominate a community. Even though prevention is the best approach, we can control invasive species by removing them manually, applying toxic chemicals, drying them out, depriving them of necessities, and stressing them using irritating elements (such as heat or sound).

26: What is happening with ***ecological restoration*** in the Florida Everglades?

The Florida Everglades were one of many areas that were affected by flood control and irrigation. Because of its depletion, wading bird populations dropped by 90-95%, and a proposed 30 years and billions of dollars will be required to restore the Everglades to a stable position. Methods such as invasive species control and native species replanting are some of the efforts used to restore the Everglades.

27: Biomes: Name the type of SOILS in the following:

**\* Temperate deciduous forests:**

Fertile soil

**\* Temperate rainforests:**

Fertile soil

**\* Tropical rainforests:**

Poor, acidic soils

**\* Tropical dry forest:**

Erosion-prone soil

**\* Desert:**

Saline soil

**\* Tundra:**

Frozen soil

**\* Boreal forest (Taiga):**

Poor, acidic soil

28: How do biomes change with altitude? *Explain.*

Biomes change with altitude because different conditions exist in different altitudes. For example, higher altitudes have lower temperatures and thinner air, which may cause cold biomes to form. Lower altitudes may support other biomes that include trees and flora that need the air and temperatures to survive.