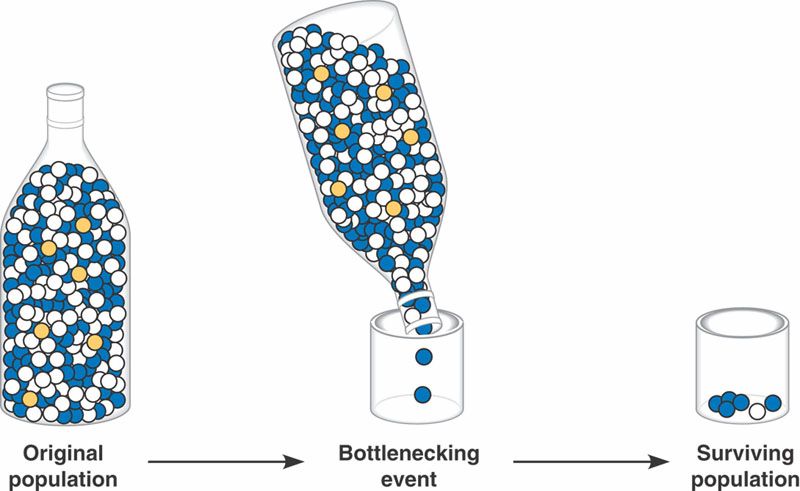
**Unit 2 The Living World: Biodiversity AP Exam Review**

**Levels of Biodiversity**

1) Define Genetic Diversity.

2) Define Species Diversity.

3) Define Ecosystem Diversity.

4) Describe how the picture to the left relates to genetic and species diversity.

**Specialist vs Generalist Species**

5) Compare a specialist to a generalist species. Give an example of each type of species.

6) Is a generalist or specialist more likely to survive in a changing environment? Explain.

7) Match the following:

* 1. generalist species Zebra mussel
  2. specialist species Galapagos tortoise
  3. invasive species American Alligator
  4. keystone species Tiger salamander
  5. indicator species Norway rat
  6. endemic Species Giant Panda

**Species Richness and Relative Abundance**

8) Define Species Richness. How is it calculated?

9) Define Relative abundance. How is it calculated?

10) What do these two things reveal about an ecosystem? Why?

**Ecosystem Services**

11) Fill in the chart below on the different types of ecosystem services

|  |  |  |
| --- | --- | --- |
| **Service Type** | **Define** | **Give a Real World Example** |
| Provisioning |  |  |
| Regulating |  |  |
| Cultural |  |  |
| Supporting |  |  |

12) Complete the following table:

|  |  |
| --- | --- |
| **Ecosystem Component** | **Ecosystem Services** |
| honey bee |  |
| water cycle |  |
| forest |  |
| bat |  |
| bacteria |  |
| coral reef |  |
| wetland |  |

**Anthropogenic Effects on Ecosystem Services**

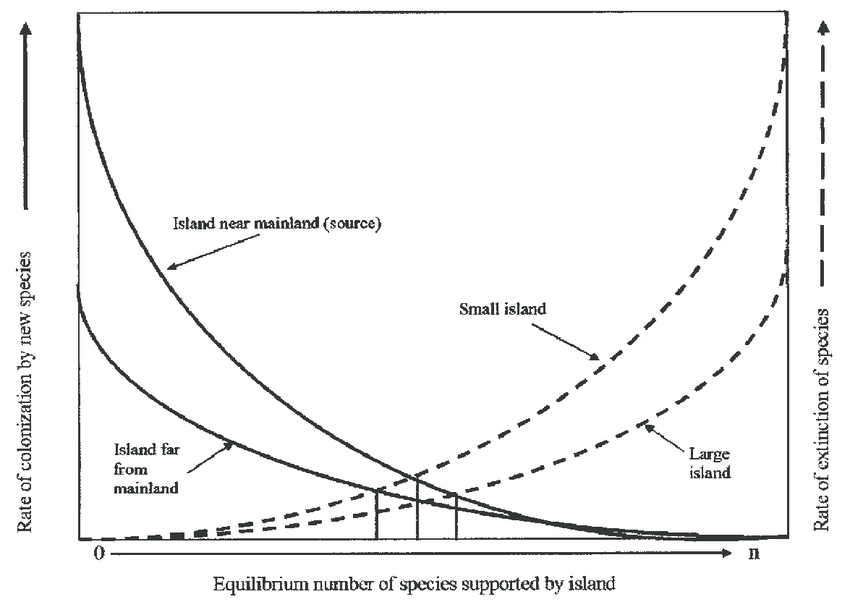
13) Describe 5 ways that humans have disrupted ecosystem services on earth:

a)

b)

c)

d)

e)

**Island Biogeography Theory**

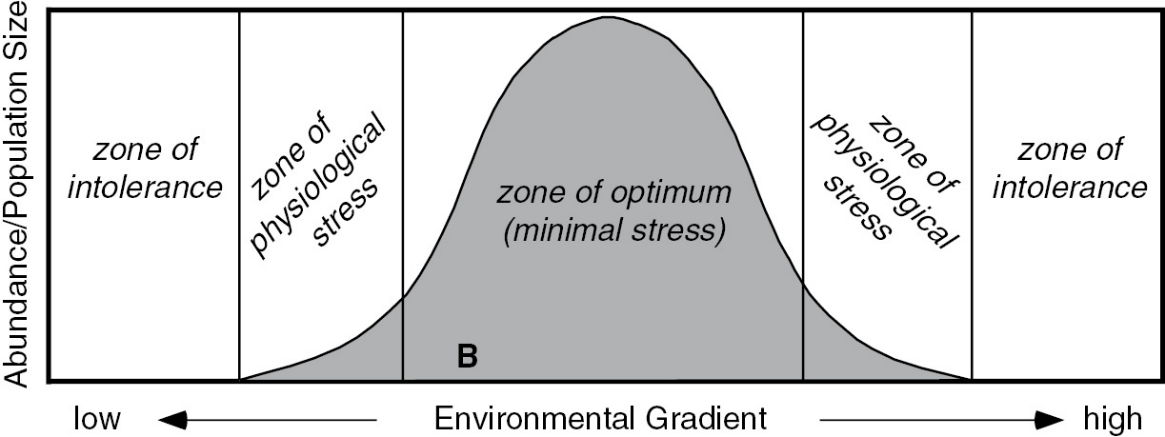
14) Two islands, different distances from the mainland have different rates of extinction, this is explained by the theory of island \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

15) Describe the trends observed in the image to the right.

16) Why are island specialists susceptible to extinction?

**Ecological Tolerance**

17) What is the range of tolerance? How can one determine what it is?

18) Define the terms in the picture below:

a) Zone of Intolerance

b) Zone pf physiological stress

c) Zone of optimum

**Natural Disruptions**

19) What are some examples of natural disruptions to the environment?

20) Compare resistance to resilience in terms of ecosystems.

**Plant Adaptations to Fire**

21) What biomes need fire for plant germination?

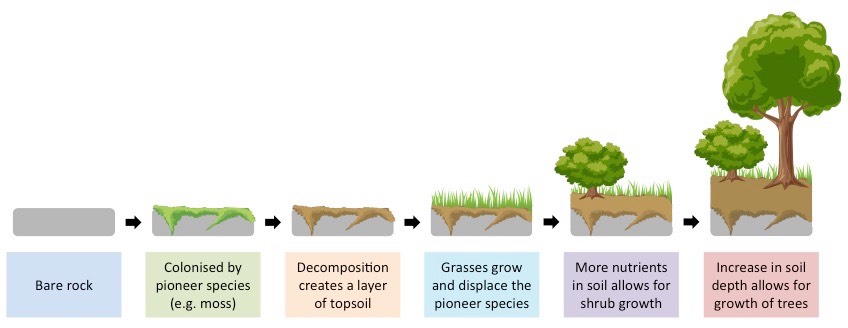
22) How have plants adapted to fire? Give at least two examples.

**Ecological Succession: Primary vs Secondary**

23) Compare and contrast primary to secondary succession. Give examples of each.

24) Define pioneer community.

25) Define climax community.

26) What type of succession is illustrated above? How can you tell?

**Species: Indicator and Keystone Species**

27) Define a keystone species. Give at least two examples.

28) Define an indicator species. Give at least two examples.

**Sample FRQ’s**

29) Biological diversity, or biodiversity, has become a topic of great concern among conservationists. Biodiversity is often used by scientists and policy makers to help determine the health of ecosystems.

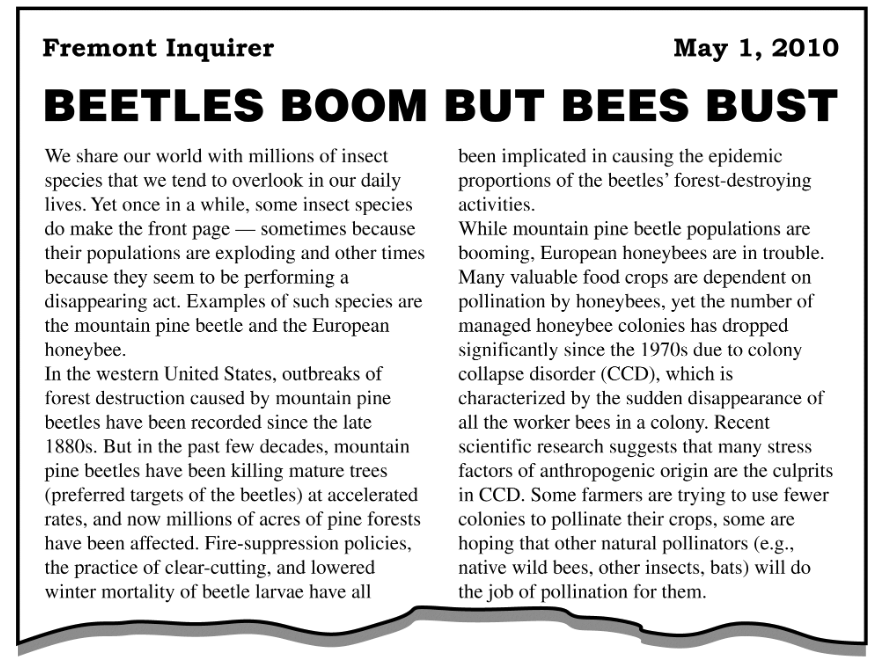
(a) Describe TWO characteristics shared by ecosystems that have high biodiversity.

(b) Identify TWO specific human activities that result in a loss of biodiversity, and explain how each activity lowers biodiversity.

(c) For each human activity you discussed in (b), propose a practical strategy (other than simply banning the activity) to reduce the loss of biodiversity.

(d) Describe ONE naturally occurring factor that could lead to a loss of biodiversity.

(e) Describe TWO ecological benefits that greater biodiversity provides.



30) Read the following article from the Fremont Inquirer and answer the questions that follow.

(a) As mentioned in the article, there are several possible explanations for the increase in mountain pine beetles.

(i) Provide one reason why fire-suppression policies lead to increased beetle activity.

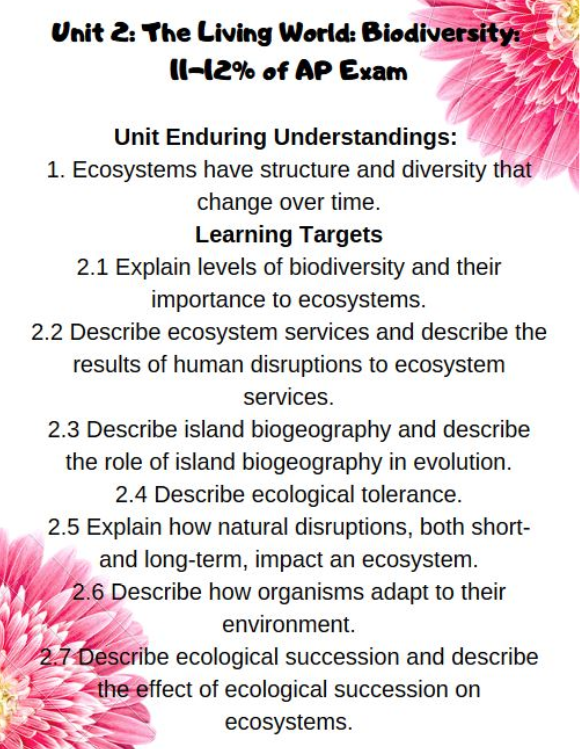
(ii) Reduced winter mortality of beetle larvae is likely a consequence of global climate change. Describe TWO ways that the activities of the beetles might enhance climate change.

(b) The widespread death of trees leads to a series of changes in a forest ecosystem. Identify TWO physical changes that occur in the forest ecosystem as the result of the death of mature trees. For each physical change you identify, describe an impact of that change on the forest ecosystem.

(c) As the article states, the number of managed honeybee colonies has dropped significantly over the past few decades. Describe TWO specific economic consequences of the collapse of the managed honeybee colonies.

(d) Pollination by native insects is considered an ecosystem service. Identify a different ecosystem service and explain how that service benefits human society.

***Modified by A. Willis from David Hong’s AP Environmental Science Review Packets (Diamond Bar HS). FRQ’s are College Board Released.***

**Unit 2 The Living World Biodiversity Review Videos**

**Mr. Andersen, Bozeman Biology**

[009 - Ecosystem Diversity](http://www.bozemanscience.com/ap-es-009-ecosystem-diversity)

[010 - Natural Ecosystem Change](http://www.bozemanscience.com/ap-es-010-natural-ecosystem-change)

[055 - Biodiversity](http://www.bozemanscience.com/055-biodiversity)

**Ted Ed**

Why is Biodiversity So Important? <https://www.youtube.com/watch?v=GK_vRtHJZu4>

Dead Stuff: <https://www.youtube.com/watch?v=KI7u_pcfAQE>

How Long Will Human Impacts Last? <https://www.youtube.com/watch?v=Zsc8G0NnMTs>

A Threat of Invasive Species: <https://www.youtube.com/watch?v=spTWwqVP_2s>

**Mrs. Campbell’s APES**

Range of Tolerance: <https://www.youtube.com/watch?v=Eo9bJVx6iyI>

Island Biogeography: <https://www.youtube.com/watch?v=8e_C4QWy_pI>

**Fuse School**

Generalist vs Specialist Species**:** <https://www.youtube.com/watch?v=bswS-Ooe4iQ>

**California Academy of Science**

Ecosystem Services: <https://www.youtube.com/watch?v=BCH1Gre3Mg0>

**HHMI BioInteractive**

Keystone Species: Some Animals are More Equal Than Others: Trophic Cascades <https://www.youtube.com/watch?v=hRGg5it5FMI>

**Crash Course**

Ecological Succession: Change is Good Crash Course Ecology #6: <https://www.youtube.com/watch?v=jZKIHe2LDP8&list=PL8dPuuaLjXtNdTKZkV_GiIYXpV9w4WxbX&index=6>

Ecosystem Ecology: Links in the Chain Crash Course Ecology #7: <https://www.youtube.com/watch?v=v6ubvEJ3KGM&list=PL8dPuuaLjXtNdTKZkV_GiIYXpV9w4WxbX&index=7>

**Khan Academy**

Ecological Succession: <https://www.youtube.com/watch?v=d7xbyNSxxrI&list=PLbjyLFA2XFZyvLJTz-oWEUURQtwnf32eP&index=11>

**Barron’s Review Chapters, 7th Edition**

Chapter 4: Ecosystems (Pg 91)

Chapter 5: Natural Biogeochemical Cycles (Pg 145)

Chapter 7: Land and Water Use, Forest Fires (Pg 213-213)

**Unit 2 The Living World: Biodiversity Vocabulary**

**species richness :** The number of different species in a community.

**Relative abundance:** The number of how many individuals are present for each species.

**Ecology**: study of living organisms in their nonliving world

**Biotic factor**: living item (ex: bacteria)

**Abiotic factor:** not living item (ex: rock)

**Ecosystem service:** the many and varied benefits to humans gifted by the natural environment and from healthy ecosystems.

**Ecological Hierarchy:** species 🡪 population 🡪 community 🡪 ecosystem 🡪 biome 🡪 biosphere

**Population**: a group of individuals of the same species

**Community:** a group of populations interacting together

**Ecosystem**: a group of communities interacting together

**Biosphere:** another name for earth

**Natural Selection**: survival of the fittest

**Salinity:** level of salt in the water

**Brackish:** medium levels of salinity. Often occurs in wetlands where salt and fresh water mix.

**Gaia hypothesis:** organisms interact with their inorganic surroundings on Earth to form a synergistic self-regulating, complex system that helps to maintain and perpetuate the conditions for life on the planet

**Range of Tolerance:** range of environmental conditions that are tolerable for survival in a species

**Ecological footprint:** a measure of human impact on Earth's ecosystems. It's typically measured in area of wilderness or amount of natural capital consumed each year.

**Primary Succession**: community change that occurs with new land formation: lichen 🡪 moss 🡪 small shrubs 🡪 small trees 🡪 large trees 🡪 climax community

**Secondary Succession**: community change that occurs with land already formed.

**Bottleneck Effect:** cut down of genetic diversity due to loss of individuals in a population.

**Non-native species:** a species that is not known historically in an area. Ex: cane toads in Australia

**Species diversity:** a count of how many species are in an area.

**Ecotone**: a transitional zone between two communities. Ex: intertidal zone.

**Niche**: an organism’s job in a community.

**Hybrid**: the offspring of two different species.

**Lichen:** a symbiotic relationship of a fungus and an algae

**Germination:** sprouting of a seed

**Competitive Exclusion Principle:** species with the same niche in the same area cannot coexist

**Keystone Species:** often a dominant predator whose removal allows a prey population to explode and often decreases overall diversity. Ex: sea otter

**Predation:** the preying of one animal on others.

**Mimicry:** the close external resemblance of an animal or plant (or part of one) to another animal, plant, or inanimate object

**Aerobic**: using oxygen

**Anaerobic:** using no oxygen