



## AP Environmental Science 2000 Student Samples

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- 301
3. Species such as the dusky seaside sparrow, the passenger pigeon, and the woolly mammoth are extinct. Populations of other species have declined to the point where they are designated as threatened or endangered.
- (a) Identify one threatened or endangered species and explain why its population has declined.
  - (b) Describe three characteristics of organisms that would make them particularly vulnerable to extinction.
  - (c) Present three arguments in favor of the maintenance of biodiversity.
  - (d) Name and describe one United States federal law or one international treaty that is intended to prevent the extinction of species.

a) Giant Panda is a species known by the masses as endangered. Only few hundred remain in the mountainous forests of China. This animal suffers from problems with habitat loss as Chinese settlement push further into the forests. Panda also faces problem with its food source, bamboo, which grows in cycles causing a famine for pandas. Also since so few of them are left that they have a problem with mating and genetic diversity. Most human attempts at mating the species fail.

b) Specialized feeding. Becomes a problem when the area is disturbed. The only source of food decreases causing die off of individuals.

Complex mating - some animals require a large number of individuals to participate in the "rituals" when a number is

## ADDITIONAL PAGE FOR ANSWERING QUESTION 3

diminished, reproduction will not occur

Susceptible Interfering with livestock. Coyotes and birds are often killed because they frequently attack foodcrops on which farmers' quality of life is based.

c) Biodiversity provides genetic material for future evolutionary processes. Without it future population will be susceptible to changing conditions without an ability to perform adaptive selection.

Biodiversity preserves genetic information useful to humans. Many medicines that are produced come from tropical areas. Many are species with potential cures are still undiscovered. Loss of diversity means loss of these species, means loss of potential knowledge

Biodiversity keeps the environment in check. One species prevents another species from destroying the entire system. Wolves keep rabbits from destroying grasslands and spiders prevent insects from destroying the plants. Didn't work on humans though, but we can control our actions, but only biodiversity can control the entire biosphere

## ADDITIONAL PAGE FOR ANSWERING QUESTION 3

d) The endangered species Act was designed to help threatened or endangered species to recover. It does so by placing limitations on hunting, fishing and encroaching on the habitat where these species prosper.

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(a) The giant redwood tree found in the United States Pacific Northwest is endangered. Its population has declined because of unsustainable forestry practices such as clearcutting to provide space for human activities such as farming. Another reason its population has declined is because of the novelty of the species. Humans, impressed by the immensity of these giant trees, have cut them down and used them as novelties either as souvenirs or for wood products such as tables or ~~flooring~~ flooring.

(b) Specialization, or a species relying on a few (or one) source of food makes that species <sup>more</sup> vulnerable <sup>to extinction</sup> than a generalist, or a species (such as humans) that relies on a wide number of food sources. A specialist is more vulnerable to extinction if that food source becomes unavailable. A species that interferes with human activities (or is perceived to interfere) is more vulnerable to extinction than a species ~~is~~ isolated from human interaction (such as a fish at the bottom of an ocean) because humans will attempt to remove that species. An example is the ~~coyote~~ coyote which is killed by farmers because coyotes eat the farmer's livestock. ~~the~~ If a species has only a few days per year ~~to~~ during which it can breed (such as the panda) it is more vulnerable to extinction because it cannot drastically increase its population in the event it is killed or ~~perched~~ poached by humans. (i.e. less time to be pregnant = less new organisms per year)

(c) Biodiversity is necessary because it keeps ecosystems more stable. That is, there are more species and alternative species which are trophic

## ADDITIONAL PAGE FOR ANSWERING QUESTION 3

level can rely on for food. Second, it is ethically correct and ecologically just to maintain biodiversity. That is, every species has a right to exist and humans should not interfere with that right. Third, it is aesthetically pleasing to humans when they are able to view and enjoy a healthy ecosystem. A healthy ecosystem is a diverse ecosystem.

(d) The Endangered Species Act asks that U.S. federal agencies such as the Fish & Wildlife Administration or the EPA to list and catalogue all species which are threatened by extinction and generate policies such as the banning of hunting these species to ensure they do not become extinct.

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a) The manatee is an endangered species. Its population has declined because selfish boaters insist upon speeding in restricted waters, and the blades of their boats kill the manatees. Also pollution of coastal water affects the manatees, killing and weakening some.

b) One characteristic that puts an organism vulnerable to extinction is if they only have one food source. Then if this species they depend on dies off, the organism can't survive. Another characteristic is if they have a low range of tolerance for changing conditions. Like if they can't handle a rapid change in the pH of an aquatic system they would die off. Another characteristic is if they have few offspring during reproduction. K strategists are very vulnerable to extinction because of the few specialized traits they have such as having very few offspring.

c) Biodiversity is essential. The more biodiversity in an ecosystem the more productive it can be. If there are more species in an ecosystem you'll get more healthy species and a better overall environment.

## ADDITIONAL PAGE FOR ANSWERING QUESTION 3

With more biodiversity there are more ecotones in which more biomes are present making for a healthier environment. And last, if you have more biodiversity there will be less genetic resistance and less intertwining of species, which will allow for species to continue their way of life without any extra threats.

d) The ~~Endangered~~ Endangered Species Act is a big contributor to the conservation of many wildlife species. When an species is deemed endangered there are lands put aside for this species and all cares of it have to be taken into consideration before human activity can proceed. This allows endangered and threatened species to have the opportunity to flourish once again.