



## AP<sup>®</sup> Environmental Science 2003 Sample Student Responses

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4. The American whooping crane and the California condor are two of North America's largest birds. Although both are rare and endangered, they are protected, and large preserves are available for them. The two species, however, seem to be responding differently to these conservation efforts.

In 1937, the whooping crane population was reduced to 14 individuals. It has since recovered; currently more than 200 birds live and breed in the wild. In the preservation of endangered species, the whooping crane is a success story. On the other hand, the California condor population declined rapidly so that no birds remained in the wild between 1987 and 1992. Condors were reintroduced into the wild after 1992 and approximately 50 condors currently live in the wild in California and Arizona. However, the recovery program cannot yet be considered a success.

- (a) Identify and describe TWO major causes for the original decline of these species. (You may describe one cause for each species or two causes for one species.)
- (b) Describe TWO measures that have been taken to protect these species. (Specify which of the species benefited from each measure.)
- (c) Describe TWO important characteristics of an endangered species that would cause it to be slow to recover.
- (d) Make one economic or ecological argument for protecting the condor, the whooping crane, or another endangered species that you identify and make one economic or ecological argument against protecting it.

a) One major cause of the decline of the ~~American~~ <sup>California</sup> condor ~~whooping crane~~ is habitat destruction by humans. We cut down the trees it lives in for lumber, and we ~~also~~ pollute the forests it's naturally found in.

A major cause of the decline of the American whooping crane is human poaching, killing the bird for its <sup>monetary</sup> value, as well as hunting for entertainment or recreation. The birds are often exploited in this way for post card pictures and their feathers are used for tourists' gift purchases.

b) One measure that has been taken to protect these species is the setting up

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of large preserves, ~~no~~ areas where the birds can mate, eat, sleep, relax + generally live freely and without human interference. Only the whooping crane seems to have benefitted thus far.

Another measure taken is government legislation that protects endangered species such as the Endangered Species Act. This act <sup>as well as other similar laws</sup> say ~~that~~ that humans cannot degrade the environment ~~of~~ <sup>as well as disallowing</sup> an endangered species inhabits ~~that~~ ~~do not~~ allow American citizens to kill the members of the endangered species for any reason. Such laws also ban the sale <sup>government</sup> of these species and their parts. These laws + regulations protect both of the species in question from killing by humans.

c) One characteristic is a small population. The fewer members there are, the less genetic variation there is and the less likely it is that favorable genes will dominate - ~~a~~ an occurrence which would lead to the strength of the species to live and thus recover.

Another characteristic is large body size. The larger an individual member of a species is, the more room it needs to live. If an endangered species is endangered

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because of habitat destruction or fragmentation, it will be difficult to find an area large enough to support large numbers of the species and sustain its members for an indefinite period of time.

d) ~~we~~ we need to protect the African elephant because it is needed to maintain biodiversity. The African elephant fulfills a specific niche in its ecosystem and with the disappearance of the entire species, ~~the~~ the whole ecosystem will be disrupted. <sup>For example:</sup> What will happen to the plants the African elephant eats? Will they grow wildly + rampantly with no other species to check or inhibit their growth?

However, one can also argue against protecting the African elephant. An elephant's tusks are made of ivory and ivory is a very profitable material. The sale of ivory, however, has been banned in order to keep people from ~~killing~~ ~~or~~ poaching elephants for the sole reason of selling their ivory tusks. Repealing these laws, and thus, the protection of the African elephant, would allow developing nations

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to make money off the ivory they already have in their possession but are not allowed to sell, and kill the elephants to gain more ivory. This influx of profits would help further these developing nations' economies - a fundamental aspect of maintaining a fruitful society.

**END OF EXAMINATION**

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4. The American whooping crane and the California condor are two of North America's largest birds. Although both are rare and endangered, they are protected, and large preserves are available for them. The two species, however, seem to be responding differently to these conservation efforts.

In 1937, the whooping crane population was reduced to 14 individuals. It has since recovered; currently more than 200 birds live and breed in the wild. In the preservation of endangered species, the whooping crane is a success story. On the other hand, the California condor population declined rapidly so that no birds remained in the wild between 1987 and 1992. Condors were reintroduced into the wild after 1992 and approximately 50 condors currently live in the wild in California and Arizona. However, the recovery program cannot yet be considered a success.

- Identify and describe TWO major causes for the original decline of these species. (You may describe one cause for each species or two causes for one species.)
- Describe TWO measures that have been taken to protect these species. (Specify which of the species benefited from each measure.)
- Describe TWO important characteristics of an endangered species that would cause it to be slow to recover.
- Make one economic or ecological argument for protecting the condor, the whooping crane, or another endangered species that you identify and make one economic or ecological argument against protecting it.

a.) ~~The~~ reasons for the decline in the population of the whooping crane is that it has a specialized habitat which is under threat from human expansion and it has a slow reproductive rate which makes it hard for it to recover from any diebacks in the population.

b.) Two measures that have been taken to protect the species is: outlawing hunting of threatened and endangered species from which both species benefit and outlawing trading or selling of any part of an endangered or threatened species also from which both species have benefited.

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c.) Two characteristics of an endangered species that would cause it to be slow to recover include: it having a slow reproductive ~~and birth~~ rate because if the population is already in decline it takes ~~to~~ a longer amount of time for the existing survivors to replace themselves ~~and the part~~ and time is the element which it does not have because ~~it takes~~ ~~a while~~ for one animal by the time one animal reproduces itself, ~~two other~~ ten others of that species may have already died taking with them the potential for added members of the species. Another characteristic is it having economic value to humans because not everyone cares for the preservation of threatened/endangered species and they will kill or capture them regardless of any law protecting them if they are worth money and since they cannot protect themselves there is not much that can be done to save them. This makes it hard for the species to recover because if it released back into the wild, ~~no one~~

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no matter what law protects them, humans will still hunt them to gain ~~economical~~ ~~value~~ money from selling or trading ~~it~~ for something ~~that~~ more valuable to them as humans do ~~it~~ when they hunt <sup>and kill</sup> elephants for their ivory even though the elephant is an endangered species, this makes it hard for the population to recover because it's faster for a population to decline if its members are not only dying of natural reasons and from predators but also from humans which they are more vulnerable to.

d) An economic reason for protecting the condor is that African elephant is that the country or region containing it will have a boost in its economy because people have to come to that specific place to see it as it is not abundant throughout the whole world and the country's tourism will increase and with it its economy as ~~a~~ now African Safaris are very popular ~~to people~~ among people and they give the African economy more input from tourism. One economic reason against

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protecting the african elephant is that more money is put into protecting it, ~~and~~ and restoring its population and habitat than is spent on other issues that are more pressing to the country. That money could be spent on better education, medical developments, or education and distribution of birth control methods which would decrease the country's population and allow for it to develop on the money that it makes when more jobs are available for the people and people will not starve or die on things that can be prevented such as vaccinations which are bought with money not spent on protecting the african elephant, rather, the people.

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**END OF EXAMINATION**

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- (a) Identify and describe TWO major causes for the original decline of these species. (You may describe one cause for each species or two causes for one species.)
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4. a) Many species have suffered from the progress of the U.S., the California Condor and the whooping crane being two such unlucky species. The development and urbanization of North America in the 20th century resulted in a massive loss of habitat for the birds. Increasing use of chemical pesticides was also harmful, as chemicals harmed the birds' reproductive success through biomagnification. Both factors caused significant ~~declines~~ declines in population.

b) Condors benefited with the ban of DDT, ~~most~~ during the 1970's precipitated by Rachel Carson's Silent Spring. Whooping cranes were helped by the Endangered Species Act, which prohibited the harming or killing of any ~~species~~ <sup>member</sup> of the Endangered Species List. Both measures compounded the benefits of preserves and re-introduction programs.

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c) Endangered species usually have a small clutch size, meaning few offspring per breeding season. This trait makes population recovery slow, species at risk ~~also are~~<sup>also</sup> generally ~~also~~ have specific diets and exist at the end of a long food chain. This means they do not easily adapt to any change in their environment.

d) Ecologically, the California Condor should be protected to maintain biodiversity. Any ~~species~~ ~~is~~ ~~the~~ ecosystem is made up of a delicate and detailed web of organisms ~~and~~ that is easily damaged, especially by the loss of a species. Economically, however, the land used ~~to~~<sup>for</sup> preserves, ~~and~~ reintroduction programs, and captive breeding could ~~be~~ better used for industry or agriculture.

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