Exam Papers Practice

# 3.4 Conservation of Biodiversity

## Mark Schemes

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| Course | SL IB Environmental Systems & Societies (ESS) |
| Section | 3. Biodiversity & Conservation |
| Topic | 3.4 Conservation of Biodiversity |
| Difficulty | Medium |



To be used by all students preparing for
SL IB Environmental Systems & Societies (ESS)
Students of other boards may also find this useful

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| Indicative Content |
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| *In order to be successful, a protected area for wolves should have the following characteristics:*<br><br>Any **two** from the following:<br><br>• Should be a shape that reduces edge effects **OR** compact in shape rather than long and thin; [1 mark]<br>• Should be sufficiently large size for wolf territories / to support a viable population; [1 mark]<br>• Should have buffer zones to reduce edge effects / minimise disturbances / to keep people away; [1 mark]<br>• Should provide protection from poachers/hunters; [1 mark]<br>• Should have community involvement / have agreement from landowners/farmers; [1 mark]<br>• Should be connected by (habitat) corridors to allow interbreeding **OR** should not be made up of smaller isolated patches/islands; [1 mark]<br>• Should contain high quality of habitat / similar conditions of the wolves' natural habitat / sufficient water and food resources (to support wolf population); [1 mark] |

| Model Answer | Commentary |
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| *In order to successfully help to protect and conserve wolf populations, protected areas for wolves should be large enough to support a sustainable and viable wolf population size, as well as to allow wolves to set up sufficiently large territories as they would in the wild [1 mark]. In addition, if the protected area is split into several patches, these must be connected* | The answer uses the terminology from the question<br><br>The answer is not vague and instead uses the specific context given in the question (i.e. wolves)<br><br>The answer does not make simple statements (e.g. "protected areas should be large", which would not gain a mark) |

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| *via habitat corridors to allow wolves to move freely throughout the wider reserve [1 mark].* | Instead, each factor is **outlined** so it is clear why that factor can make protected areas successful for wolves |

2a

| Indicative Content | Commentary |
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| *Captive breeding programmes in zoos may help in the protection of endangered species, such as the western lowland gorilla, in the following ways:*<br><br>Any **three** from the following:<br><br>• Fewer (wild) animals need to be caught (for zoos); [1 mark]<br>• Animals have a greater chance of becoming pregnant (than in the wild) e.g. through IVF / easier to find a mate; [1 mark]<br>• Reintroduction into the wild (of animals bred in captivity); [1 mark]<br>• (Scientific) research is easier with captive animals **OR** scientists / researchers can study the species up close/in detail for a greater understanding of how to protect it (in the wild); [1 mark]<br>• (Overall) increase in numbers (of the species); [1 mark] | Captive breeding programs are conservation initiatives aimed at breeding and raising endangered or threatened species in controlled environments such as zoos, aquariums, wildlife reserves, and breeding facilities.<br><br>The primary goal of captive breeding programs is to increase the population size of a species that is at risk of extinction in the wild |

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| Antenatal / postnatal care provided **OR** care provided for animals during/after pregnancy; [1 mark] | |

2b

| Indicative Content |
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| *Disadvantages of captive breeding programmes include:*<br><br>Any **three** from the following:<br><br>• Inbreeding; [1 mark]<br>• Gene pool too small **OR** low genetic diversity may mean species unable to adapt / leave species vulnerable to changing environment e.g climate change / disease; [1 mark]<br>• No fear of humans (once reintroduced to the wild); [1 mark]<br>• Difficulty in socialising with other individuals of the same species (once reintroduced to the wild) **OR** difficulty in reproducing (in the wild); [1 mark]<br>• Difficulty in finding food; [1 mark]<br>• (Possible) transfer of pathogens (to wild individuals/populations); [1 mark]<br>• Other named negative effect of captivity eg. stress; [1 mark]<br>• Can be (very) expensive / not cost-effective; [1 mark] |

3a

| Indicative Content |
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| *Reasons why the Slippery elm species should be conserved include:*<br><br>Any **two** from the following:<br><br>• To maintain the supply of (traditional) medicine; [1 mark]<br>• To allow (future) access to potential medicines / useful compounds (that might not yet have been discovered); [1 mark] |

- To preserve habitats for animals / other plants / microorganisms; [1 mark]
- To maintain biodiversity / not to upset the ecological balance / for ethical/moral reasons; [1 mark]
- To prevent large-scale slaughter / exploitation of trees; [1 mark]

3b

| Indicative Content |
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| *i) The full name of the CITES treaty is:*<br><br>• (The) Convention on International Trade in / of Endangered Species (of Wild Fauna and Flora); [1 mark]<br><br>*ii) The main aim of CITES is:*<br><br>• To protect / conserve species which are endangered by trading activities **OR** to prevent the trade of species endangered **OR** to regulate trade at cross border controls; [1 mark] |

4a

| Indicative Content | Commentary |
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| *i) Scientists must be careful when carrying out captive breeding programmes for small populations because:*<br><br>Any **one** from the following:<br><br>• (There is a) high likelihood of relatives being bred together; [1 mark]<br>• Which could lead to inbreeding (depression); [1 mark]<br>• Potentially increases the frequency of harmful genes / | For part (ii), there are a range of other valid answers not listed in this mark scheme<br><br>Any other valid answer; [1 mark]<br><br>Remember that not every species has a native habitat of forest or requires trees for their survival, so vague answers like reforestation or planting trees would not gain credit here |

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| (genetic) mutations / (recessive) genetic conditions/diseases; [1 mark]<br><br>*ii) Other conservation strategies could be:*<br><br>Any **two** from the following:<br><br>• *In-situ* conservation; [1 mark]<br>• Removal of invasive species; [1 mark]<br>• Fire-prevention strategies; [1 mark]<br>• Planting of plant species that benefit the central rock rat e.g. as a food source; [1 mark]<br>• Providing protection from natural predators; [1 mark] | |

4b

| Indicative Content | Commentary |
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| *A habitat-based conservation approach may be more successful than a species-based approach for the following reasons:*<br><br>Any **three** from the following:<br><br>• Conserving habitats protects numerous species **OR** Habitats provide essential resources like food, shelter, and breeding grounds, which are critical for the survival/reproduction of numerous species; [1 mark]<br>• Preservation of diverse habitats leads to increased species | A habitat-based conservation approach is a strategy for preserving and protecting biodiversity by focusing on the conservation and management of specific habitats or ecosystems<br><br>A species-based approach to conservation is a strategy that prioritizes the protection and preservation of individual species, particularly those that are endangered, threatened, or of special concern |

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| diversity **OR** conservation of habitats promotes ecosystem stability/resilience, ensuring the survival of various species within complex ecological networks; [1 mark]<br>• Habitats play a crucial role in supporting the unique adaptations of species to their specific niches; [1 mark]<br>• Species can only exist beyond their natural habitat in artificial environments like zoos, limiting their population size; [1 mark]<br>• Consequently, genetic diversity within captive organisms is also limited; [1 mark]<br>• Preserving habitats can protect keystone species, which have disproportionate effects on their ecosystems, influencing the abundance/diversity of other species; [1 mark]<br>• Focusing on habitat conservation addresses the root causes of / highlights the problem of biodiversity loss, addressing threats to multiple species simultaneously; [1 mark]<br>• A healthy habitat can support the natural processes of speciation/adaptation, fostering the evolution of new species over time; [1 mark] | |