

# Conservation

## Question Paper 3

<b>Level</b>	International A Level
<b>Subject</b>	Biology
<b>Exam Board</b>	CIE
<b>Topic</b>	Biodiversity, classification and conservation
<b>Sub Topic</b>	Conservation
<b>Booklet</b>	Theory
<b>Paper Type</b>	Question Paper 3

**Time Allowed :** 69 minutes

**Score :** / 57

**Percentage :** /100

**Grade Boundaries:**

A*	A	B	C	D	E	U
>85%	'77.5%	70%	62.5%	57.5%	45%	<45%

- 1 The Santa Cruz tarplant, *Holocarpha macradenia*, is a tall annual plant that grows only in the coastal grasslands in California. An annual plant is one that grows, flowers, produces seeds and dies in less than one year.

The tarplant used to be widely spread in California, but there are now only nine natural populations. It is listed as an endangered species.

- (a) (i) Suggest **two** reasons why the tarplant has become endangered.

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- (ii) State three reasons why it is important to conserve species.

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2. ....  
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3. ....  
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..... [3]



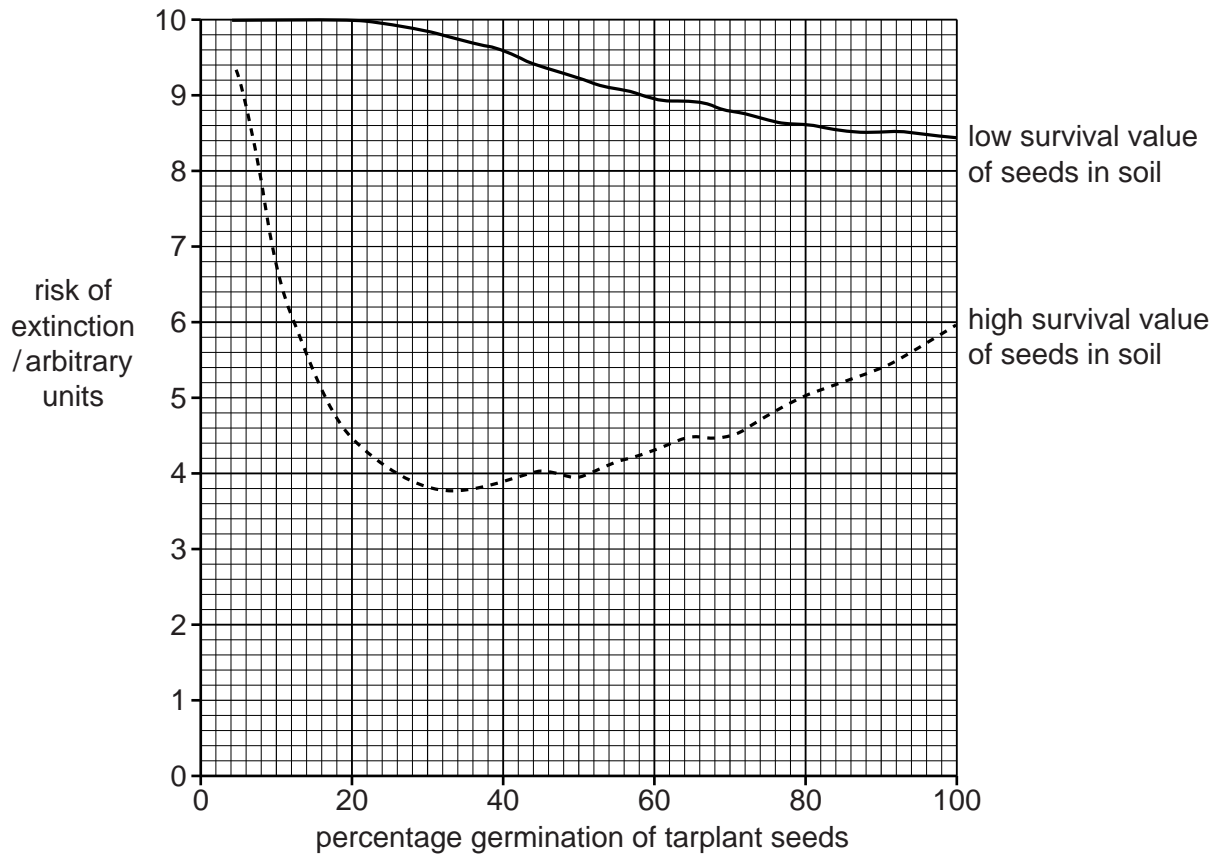


Fig. 4.1

- (i) With reference to Fig. 4.1, describe the effect of each of the following on the risk of extinction of the tarplant:

high compared to low survival of the tarplant seeds

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different germination percentages of the tarplant seeds.

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- (ii) With reference to Fig. 4.1, discuss whether scraping the soil should be recommended as part of the management strategy to attempt to conserve the tarplant.

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..... [3]

[Total: 15]



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A series of horizontal dotted lines for writing.

- 3 Sarawak is an area of south-east Asia that is largely covered by tropical rainforest. Logging has been allowed in large parts of the forest. A study was carried out to estimate the population size of different species of mammals living in the rainforest:
- before logging
  - immediately after logging
  - two years after logging
  - four years after logging.

Table 8.1 shows the results of the study for six species of mammal. Where numbers were too small to measure the population density, the species were recorded as “present”.

**Table 8.1**

mammal	mean number of animals km <sup>-2</sup>			
	before logging	immediately after logging	two years after logging	four years after logging
marbled cat	present	0	0	0
small-clawed otter	present	0	0	0
giant squirrel	5		4	1
treeshrew	10	5	10	38
small squirrel	16	24	104	19
barking deer	3	1	10	present

- (a) Calculate the percentage rise in the small squirrel population from before logging to two years after logging.

Show your working.

answer ..... % [2]



**(b)** Suggest why populations, such as that of the small squirrel, do not increase in size indefinitely.

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**(c)** Suggest why marbled cats and small-clawed otters became extinct in this area but the other mammals did not.

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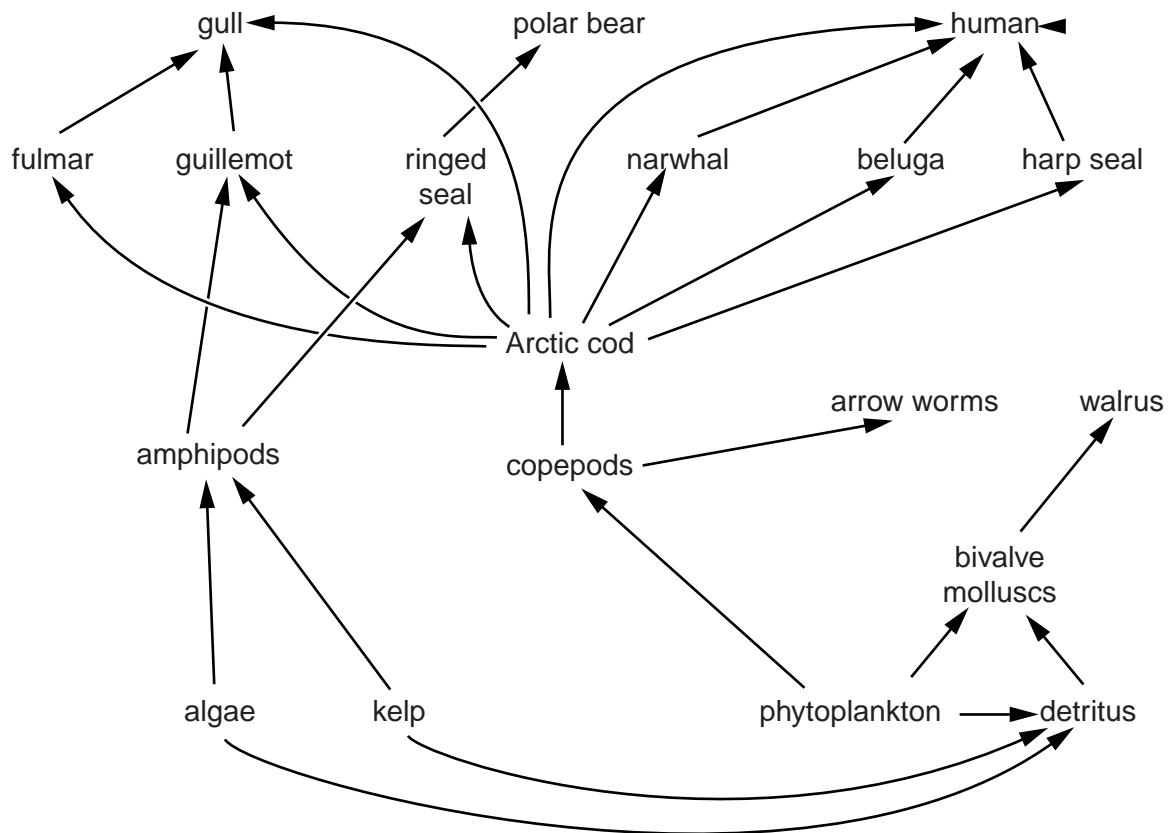
..... [2]

[Total: 8]

- 4 Lancaster Sound in the Canadian Arctic is a very productive marine environment and supports large populations of sea birds and marine mammals.

Studies of the area have shown the importance of Arctic cod, *Boreogadus saida*, in the flow of energy to marine birds, such as guillemots and fulmars, and marine mammals, such as narwhals and belugas. Arctic cod forms the main, or only, source of food for many such animals.

The flow of energy through the food web in Lancaster Sound is shown in Fig. 4.1.



Note: detritus is dead and decaying matter

Fig. 4.1

- (a) Name the trophic levels occupied by the following organisms in the food web in Fig. 4.1:

kelp .....

arrow worms .....

narwhals. .... [3]

- (b) The population of polar bears in the Lancaster Sound area is quite small in comparison to populations of animals that feed on Arctic cod.

Using **only** the information shown in Fig. 4.1, explain why the population of polar bears is small.

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- (c) Populations of many fish species are under threat of extinction as a result of over-fishing. Explain the likely consequences of over-fishing of Arctic cod.

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[Total: 10]

- 5 The Ethiopian wolf, *Canis simensis*, is a member of the Canidae family of carnivores.

Fig. 1.1 shows an Ethiopian wolf.



Fig. 1.1

- (a) Ethiopian wolves evolved from an ancestor similar to the grey wolf that crossed into Northern Africa from Europe about 100 000 years ago.

They live in the alpine grasslands and heathlands at, or above, 3000m altitude in Ethiopia.

State the most likely type of speciation that led to the evolution of the Ethiopian wolf.

.....[1]

- (b) A population of Ethiopian wolves is called a pack.

Heterozygosity has been found to be low in all of the packs of Ethiopian wolves that have been studied.

Suggest why the heterozygosity may be low in Ethiopian wolf packs.

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.....[2]

- (c) The Ethiopian wolf is classified as an endangered species by the International Union for the Conservation of Nature and Natural Resources (IUCN). It publishes an annual list of endangered species called the Red List.

Complete Table 1.1 to summarise four of the main reasons, with further explanation, as to why the Ethiopian wolf has become an endangered species.

Table 1.1

reason	explanation
	an activity that accompanies human expansion and reduces the size of the wolf habitat
rabies, a lethal viral disease of wolves	
	a human activity to control wolves, considered to be pests
	the result of wolves breeding with domestic dogs

[4]

- (d) According to the Red List, the number of endangered mammal species in 2007 was 349 and in 2008 was 448.

Calculate the percentage increase in endangered mammal species between 2007 and 2008.

Give your answer to the **nearest whole number**.

Show your working.

answer .....% [2]

[Total: 9]