OCR
Oxford Cambridge and RSA

A Level Biology A

H420/02 Biological Diversity

Question Set 8

1 Penguins are flightless birds that eat fish. Most species of penguin live near the coast of Antarcticaor on the many islands that surround Antarctica.

Fig. 17 shows the populations of three penguin species on an island off the coast of Antarctica.

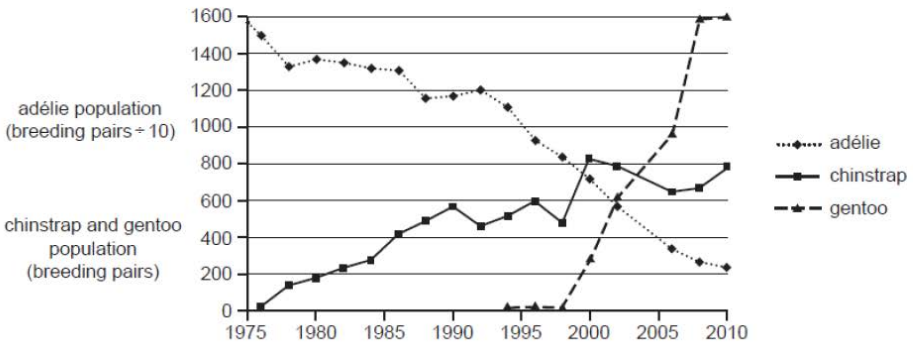

Fig. 17

(a) (i) Before 1975 the only penguin species on the island was the adélie penguin. Chinstrappenguins were first recorded on the island in 1976.

The changes in the chinstrap penguin population are not directly related to abioticfactors.

Suggest explanations for the changes in the population of **chinstrap** penguins between1976 and 2010. **[3]**

The population increases due to food and nesting sites are available with little or no competition. Then the number of chinstrap penguin plateaus due to increase in competition as gentoos arive.

(ii) Calculate the mean annual decrease in the **adélie** penguin population between **1988** and **2010**.

Show your working. Give your answer to **three significant figures**.

$\frac{(1150 - 205) \times 10 \times 2}{2010 - 1988} = \frac{18900}{22} = 859$ /year Answer 859 per year **[2]**

(b) (i) Adélie penguins need a habitat that contains sea-ice. Gentoo and chinstrap penguins cansurvive without access to sea-ice.

Scientists have claimed that the population changes in the three penguin species on theisland suggests that the Antarctic temperature is increasing.

Discuss whether the information in Fig. 17 supports the scientists' claim.

You should refer to the data in Fig. 17 in your answer. **[3]**

Fig 17 doesn't support the scientist's claim because the change in different penguin species population could be due to the arrival of gentoo/ chinstrap which increases the competition. For exomple, as gentoos outcompete chinstraps the population of gentoos increases whilst the

population of chinstrap decreases. Furthermore, the change in population could be due to a different factor other than temperature. The correlation we see between 3 different penguin species does not mean causation.

(ii) Scientists working in the local area monitored water temperatures and populations ofother water animals around the island between 1976 and 2010.

Suggest **two** further pieces of evidence that the scientists might have found to support their claim. **[2]**

Reduction in extent of ice
New animal species present on land

Total Marks for Question Set 8: 10