Question 3 **(10 marks)**

Habitat loss and the distribution of mammal species in Australia are closely related. Over the past 100 years, many animals have disappeared from areas or relocated to ones that provide more suitable climatic conditions. The dibbler (*Parantechinus apicalis)*, an endangered marsupial, was once found throughout the south-west of Western Australia, where Phytophthora dieback is also present. Dieback produces an infection that causes the death of trees and shrubs. Since the dibbler was discovered in 1842, fossils, specimens and trapping records have been used to record the distribution of the species.

Past and present distribution of the dibbler based on fossil records, museum specimens collected and recent capture

(a) State **one** reason why scientists use past data when studying species distribution. (1 mark)

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(b) Dibblers are carnivorous marsupials which feed on small vertebrates such as mice, birds and lizards as well as insects and other invertebrates. Explain how the presence of dieback may have affected the population of dibblers. (3 marks)

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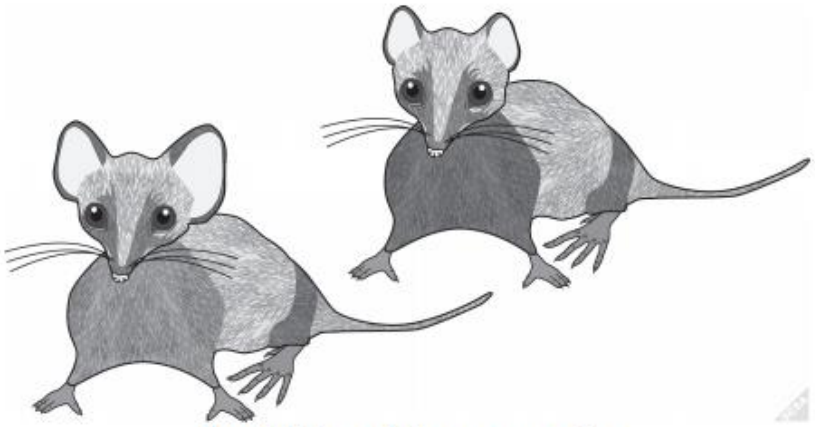
Question 3 (continued)

(c) State **one** reason why scientists would be interested in predicting suitable habitats of animal species. (1 mark)

Genetic diversity is important to the survival of a species. The illustration below shows an example of diversity between two dibblers.



Two dibblers of the same species

(d) Describe why genetic diversity is important to the survival of a species. (2 marks)