

- 1 Nuthatches are small, colourful birds belonging to the genus, *Sitta*. Many varieties of the species *Sitta europaea* (European nuthatch) can be found throughout mainland Europe. These varieties form overlapping populations in different regions. These birds eat small invertebrates, living in tree bark, throughout the year.



European nuthatch. Magnification x0.5  
Leslie J Borg/Science Photo Library

However, in the colder mountain forests on the island of Corsica, a small population of approximately 2500 pairs of nuthatches can be found. These birds are classified as the species *Sitta whiteheadi* (Corsican nuthatch). For most of the year, they feed on pine seeds. During the summer breeding season they also feed on small invertebrates.

Members of the two species, *S. europaea* and *S. whiteheadi*, are so similar in appearance and behaviour that they can usually only be distinguished by expert observation and research.

(a) Place a cross ☒ in the box next to the best definition of a species.

(1)

- A individuals can interbreed to produce fertile offspring
- B individuals can interbreed to produce hybrid offspring
- C individuals can interbreed to produce sterile offspring
- D individuals can interbreed to produce viable offspring

*\* (b) In mountainous regions of mainland Europe, only *S. europaea* is found. Suggest how a distinct species of nuthatch, *S. whiteheadi*, has evolved in the mountainous regions of the island of Corsica.*

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*(c) (i) Suggest how environmental changes, such as those caused by global warming, are more likely to cause extinction of *S. whiteheadi* than *S.europaea*.*

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(ii) Suggest why *S. whiteheadi* might be able to survive an environmental change such as global warming.

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(d) Explain how the work of zoos could be important to the survival of *S. whiteheadi*.

(2)

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**(Total for Question 1 = 13 marks)**