Solutions

Marking: **M1** a correct method, **A1** the correct answer, **B1** an independent mark.

Each answer shows the steps, then the **result**.

2.1

each piece of forest is smaller, so it supports smaller populations, which die out more easily; animals cannot cross the road to find mates, and more of the forest is edge, so species that need the deep interior lose habitat

2.2

bees pollinate many crops, such as apples and almonds; with fewer bees, yields fall, or farmers must pay to rent hives or pollinate by hand

2.3

the climate the species needs shifts toward the poles or uphill; the reserve boundary stays where it is, so the suitable habitat ends up on land that is not protected

3.1

(a) larger fragments hold more bird species; from 5 species in 1 ha to 40 in 1000 ha

(b) in a small fragment, most of the area is edge, with more light, wind and predators; so species that need the cool, sheltered interior cannot live there

(c) plant wildlife corridors between fragments; birds can move between them, so populations are larger and species that die out in one fragment can return

3.2

(a) $(27\,800 - 4600)/27\,800 \times 100$; $= 83\%$

(b) any two: cattle ranching; growing soybeans; logging for timber; building roads and dams; mining

(c) any two: satellites watched the forest, so illegal clearing was found fast; laws were enforced and fines given; new protected areas; companies agreed not to buy soy from newly cleared land

(d) any two: carbon storage: trees hold carbon, so clearing releases CO_2; rainfall: trees return water to the air, so clearing can cause drought; habitat and medicines: many species are lost; soil: roots hold soil, so clearing causes erosion

3.3

(a) habitat loss, 63%; disease from the chytrid fungus, 30%

(b) chemicals pass easily through their thin skin; they live both in water and on land, so they meet pollution in both

(c) many species face more than one threat; each species is counted once under every threat it faces

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(d) any two: protect and restore wetlands and ponds; clean boots and equipment to stop the fungus spreading; use fewer pesticides; build tunnels under roads; captive breeding of the rarest species