Solutions

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

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

2.1

ships pump water into their tanks in one port to stay stable, and it contains larvae and small organisms; they pump it out in another port, far away, releasing the organisms there

2.2

each female lays up to a million eggs a year, so the population grows very fast (r-selected); there are few predators to eat them, and they can attach to any hard surface, so nothing limits them

2.3

the control species may eat or harm native species instead of the pest; it may have no predators in its new home, so it spreads; cane toads are poisonous and kill native predators that eat them

3.1

(a) zebra mussels rose from 0 to about 30 000 per m^2; native mussel species fell from 20 to 2

(b) zebra mussels attach to native mussel shells, so the natives cannot open to feed and they die; zebra mussels filter out the plankton, so natives have less food

(c) they block the water intake pipes of power plants and water works; so the pipes must be cleaned or replaced, which costs money

3.2

(a) more lionfish, fewer small native fish; from 120 fish with no lionfish to 30 with 150 lionfish per hectare

(b) they breed all year and eat many kinds of fish, so food never limits them (generalist); their poisonous spines mean few predators eat them

(c) any two: divers spear them, for example in fishing contests; encourage people and restaurants to eat lionfish; traps; teach local predators such as groupers to eat them

(d) without the grazers, algae grow over the coral; the coral is shaded and cannot get enough light, so it weakens and dies

3.3

(a) island species often evolved without predators, so they do not know how to escape them; their populations are small, and they cannot move away, so they die out quickly

(b) they hid in cargo on ships and planes; cargo was not checked, so they arrived without anyone noticing

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(c) the birds ate insects and spiders, so these increased; or the birds spread seeds, so fewer new trees grow

(d) any two: check cargo with trained dogs; set traps around ports and airports; inspect planes before they leave; strict laws on moving goods