

- (c) In 1992, new laws were introduced across south-west Europe to protect the grey wolf.

Fig. 2.2 shows the distribution of grey wolf populations in south-west Europe in 1970 and 2012. No grey wolves from captive-breeding populations were released into the wild in south-west Europe during the period from 1970 to 2012.

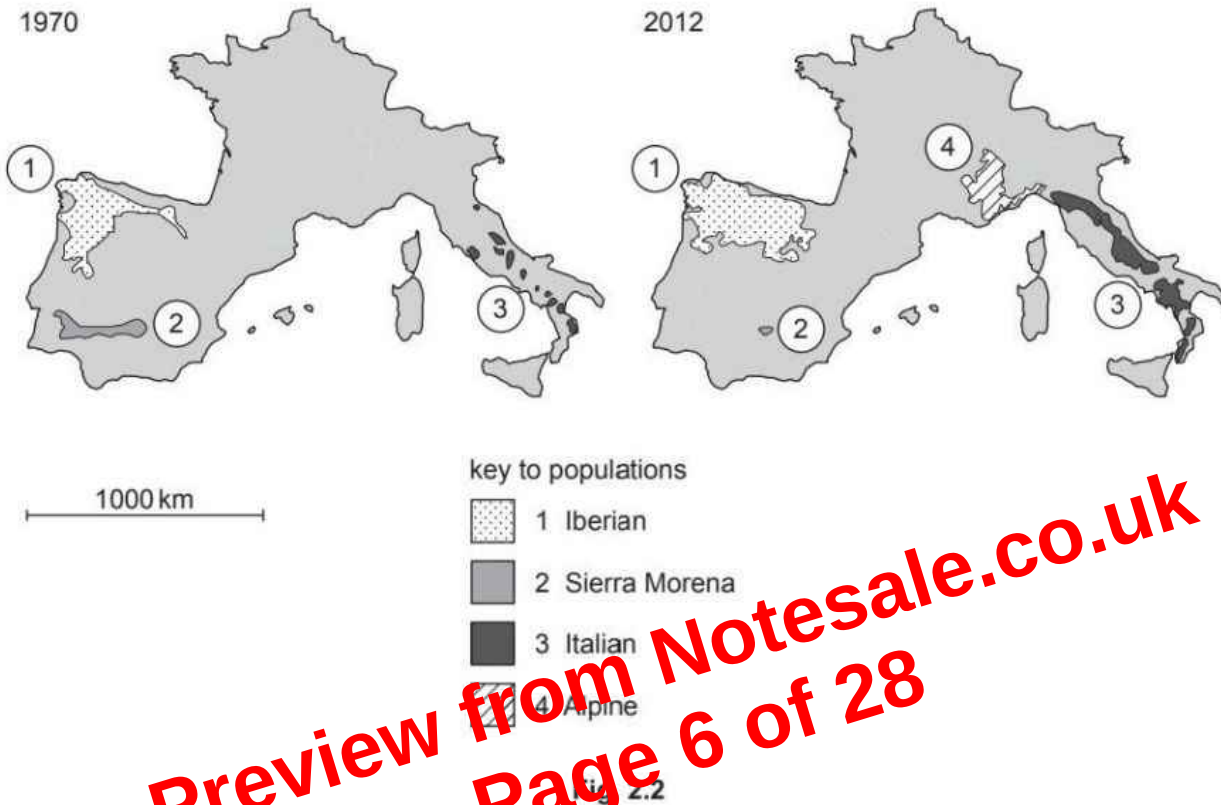


Table 2.1 shows the sizes of the populations of grey wolf shown in Fig. 2.2.

Table 2.1

population	size of population in 1970	size of population in 2012	percentage change
1 Iberian	700	2500	
2 Sierra Morena	60	6	–90
3 Italian	100	800	+700
4 Alpine	0	160	(+)257 / 260

- (i) Complete Table 2.1 to show the percentage change in the size of the Iberian grey wolf population from 1970 to 2012.

Write your answer in the table to the nearest whole number.

[1]

- (ii) With reference to Fig. 2.2 and Table 2.1, describe the changes to the grey wolf populations in south-west Europe from 1970 to 2012.

1. overall increase in grey wolf numbers

2. decrease in Sierra Morena population

3. alpine population is new population

4. increase in area for Iberian / Italian populations

[3]

- (d) (i) In regions of south-west Europe where grey wolf populations are present, farmers are concerned for the safety of their livestock, such as sheep.

Suggest how governments can help farmers who are concerned for the safety of their livestock.

compensation scheme for loss of livestock

or idea of protection of livestock

or allow controlled culling of wolves

[1]

- (ii) Suggest measures that could help to protect wild populations of grey wolves in south-west Europe.

1. reserves / national parks

2. education e.g. public awareness programmes

3. research qualified e.g. habitat, diet, reproduction

4. ban on hunting

5. monitor populations

[3]

[Total: 14]

- 5 (a) Many processes and actions in plants and animals are due to the movement of ions.

Table 5.1 lists several ions, the direction of movement of each ion and the action resulting from that movement.

Complete Table 5.1.

Table 5.1

ion	direction of movement of ion	action resulting from movement of ion
Na^+	from lumen of proximal convoluted tubule into proximal convoluted tubule cell	co-transport amino acids / glucose or osmosis of water
K^+	into guard cell	opening of stoma(ta)
Na^+	into presynaptic knob	depolarisation of presynaptic membrane
Ca^{2+}	into presynaptic knob	release of acetylcholine into synapse
H^+	from intermembrane space into matrix of mitochondrion	ATP synthesis
Ca^{2+}	from sarcoplasmic reticulum to cytoplasm of muscle fibre	binds to troponin / troponin shape changes, actin binding site on myosin head exposed / allows power stroke

[6]

Section B

Answer **one** question.

9 (a) Compare the characteristic features of the domains Eukarya and Bacteria. [8]

(b) Describe the methods used to conserve endangered **plant** species. [7]

[Total: 15]

10 (a) Explain what is meant by bioinformatics **and** outline the role of bioinformatics following the sequencing of genomes of humans and parasites. [6]

(b) Explain how a microarray can be used to analyse gene expression in a tissue sample. [9]

[Total: 15]

Answer 9 (a)

Eukarya v Bacteria

1. nucleus v no, nucleus / nuclear envelope
2. linear DNA v circular DNA (plasmid)
3. histone proteins associated with DNA v no histone proteins
4. double membrane bound organelles v no membrane-bound organelles
5. 80S ribosomes v 70S ribosomes
6. cell wall sometimes present v cell wall always present
7. cell wall (if present) made of cellulose / chitin v cell wall made of peptidoglycans
8. cells divide by mitosis v cells divide by binary fission
9. multicellular v unicellular
10. differences in flagellum structure

Answer 9 (b)

1. botanic gardens
2. research
3. controlled named growing conditions ; e.g. light / water / nutrients /temperature
4. propagation e.g. cuttings / tissue culture
5. plant back to natural environment