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Environmental systems and societies
Standard level
Paper 1 – resource booklet

30 April 2026

Zone A afternoon | **Zone B** afternoon | **Zone C** afternoon

1 hour

Instructions to students

- Do not open this booklet until instructed to do so.
- This booklet contains all the resources to answer paper 1.

Figure 1(a): World map showing location of France

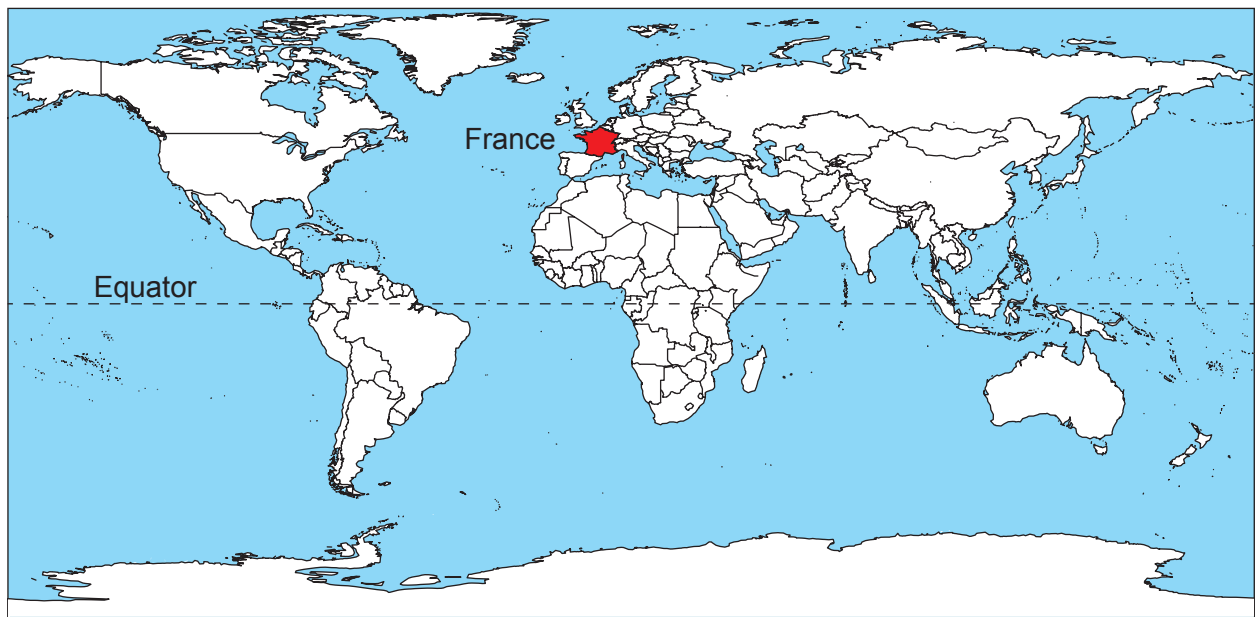


Figure 1(b): Map of France with neighbouring countries



Figure 1(c): Map showing the location of Corbières-Fenouillèdes Natural Park in France

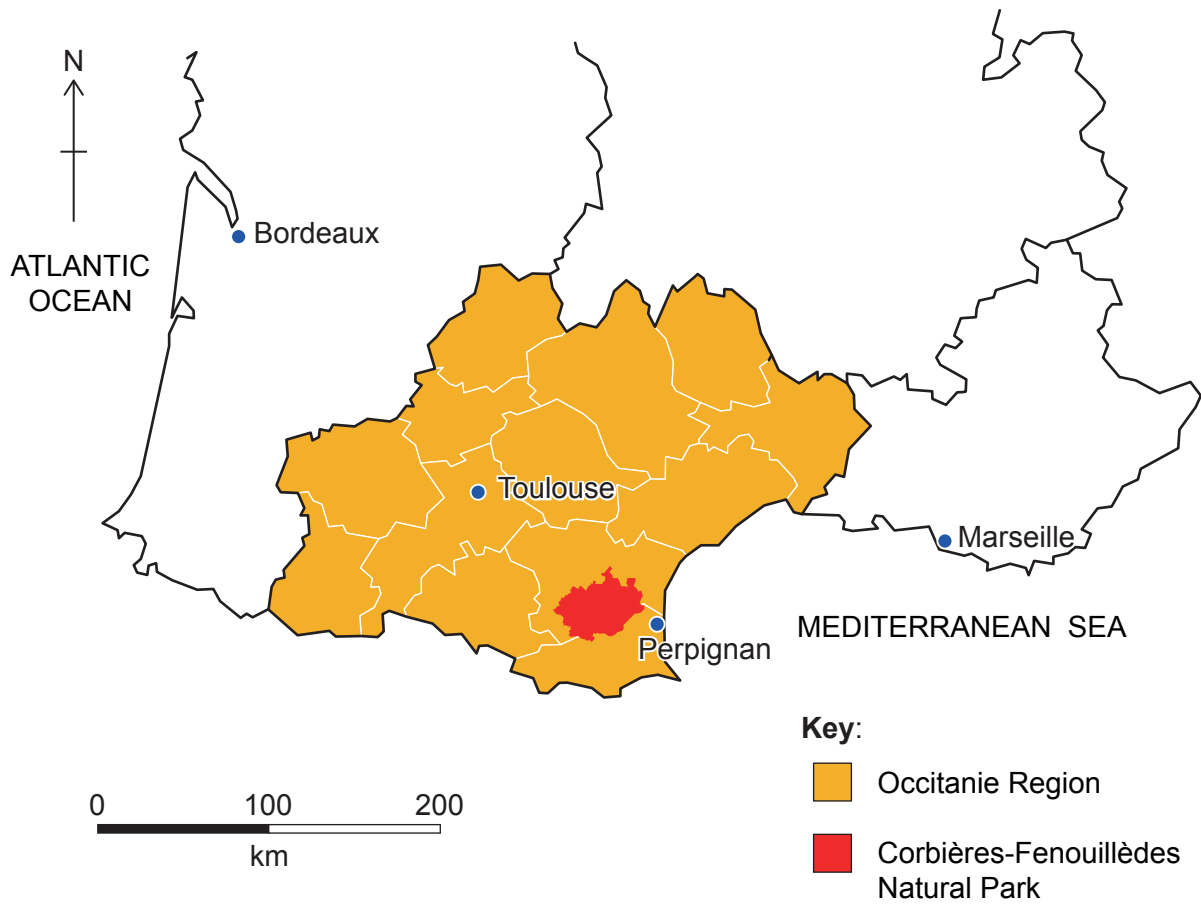


Figure 1(d): Climate data for the Corbières-Fenouillèdes Natural Park

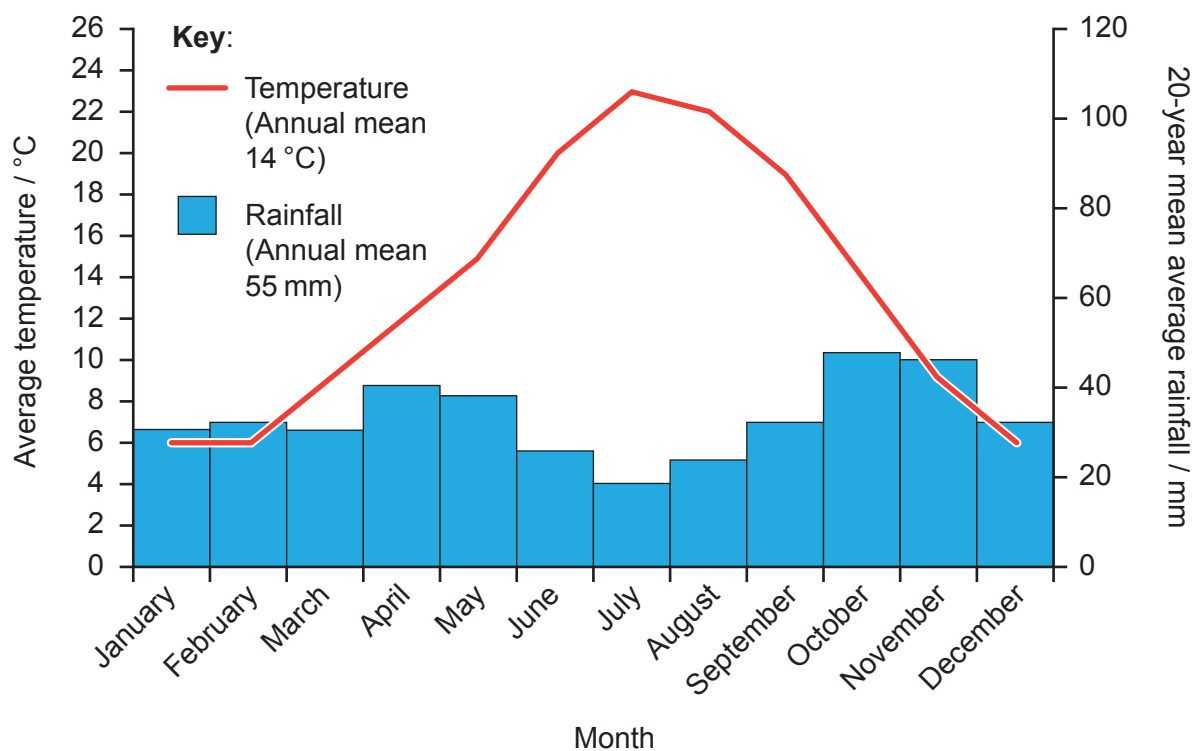


Figure 1(e): Biomes by temperature and precipitation

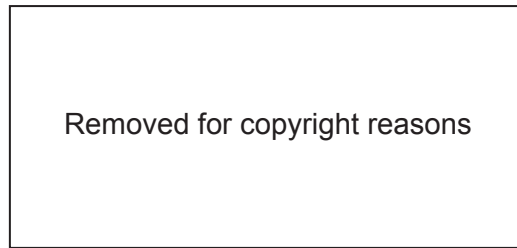


Figure 1(f): Fact file on the Corbières-Fenouillèdes Natural Park

- One of 58 nationally recognized nature parks across France
- Regional areas have voluntarily chosen a development method based on the enhancement and protection of natural and cultural heritage considered rich and fragile
- Created in 2021 and recognized for its natural and cultural history
- An area of 1800 km²
- Low resident population of around 30 000 people
- Around 26 000 visitors each year, mainly in the summer
- A region of river valleys and low mountains running from the Mediterranean coast to the Pyrenees
- Popular tourist destination with city of Perpignan and the summer beach resorts of Le Barcarès, Canet Plage and Argelès-sur-Mer to the south
- Extensive wine production in valley bottoms. Lower slopes of mountains traditionally supported small-scale, low-impact seasonal grazing of goats, sheep and cattle
- Mainly areas of grassland (prairie) and scrub (garrigue) on lower slopes
- Closed-canopy forests are found on steeper slopes
- Many rocky ledges on steep valley cliffs
- Part of Mediterranean-type ecosystems with exceptionally high plant biodiversity with many endemic species
- Contains six areas designated as Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) under the European Union's Habitats Directive and Birds Directive

	Number of species found in the Corbières-Fenouillèdes Natural Park	Status under the French National Strategy for the Creation of Protected Areas (SCAP)
Orchids	75	16 heritage, 8 protected
<i>Gagea spp</i> (a lily species)	6	All protected
Birds of prey	16	All protected

Figure 1(g): Images of typical habitats of the Corbières-Fenouillèdes Natural Park



Figure 1(h): Carbon and water footprints of wine production process (per bottle)

	Amount per bottle	Main use
Carbon dioxide	1.28 kg	Agricultural vehicles, transport and electricity during wine production
Water (artificial irrigation is banned in the Corbières)	632.20 l	For growing vines, sterilization during bottling and crop spraying with pesticides

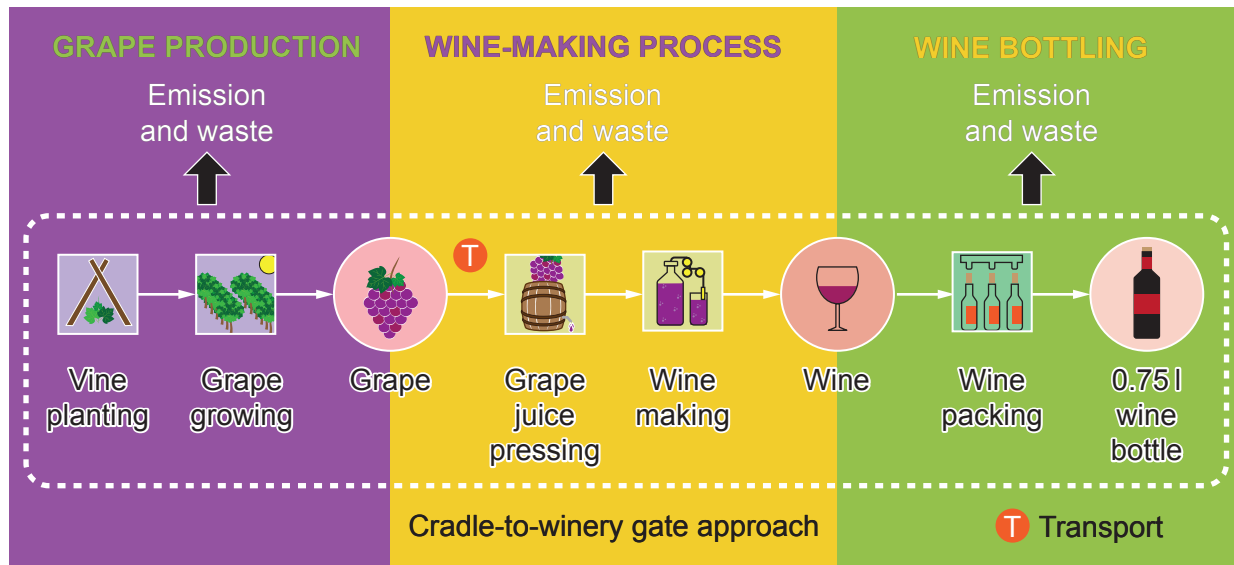


Figure 2(a): Image of Lac sur l'Agly



Figure 2(b): Position of Lac sur l'Agly on the river Agly in the region

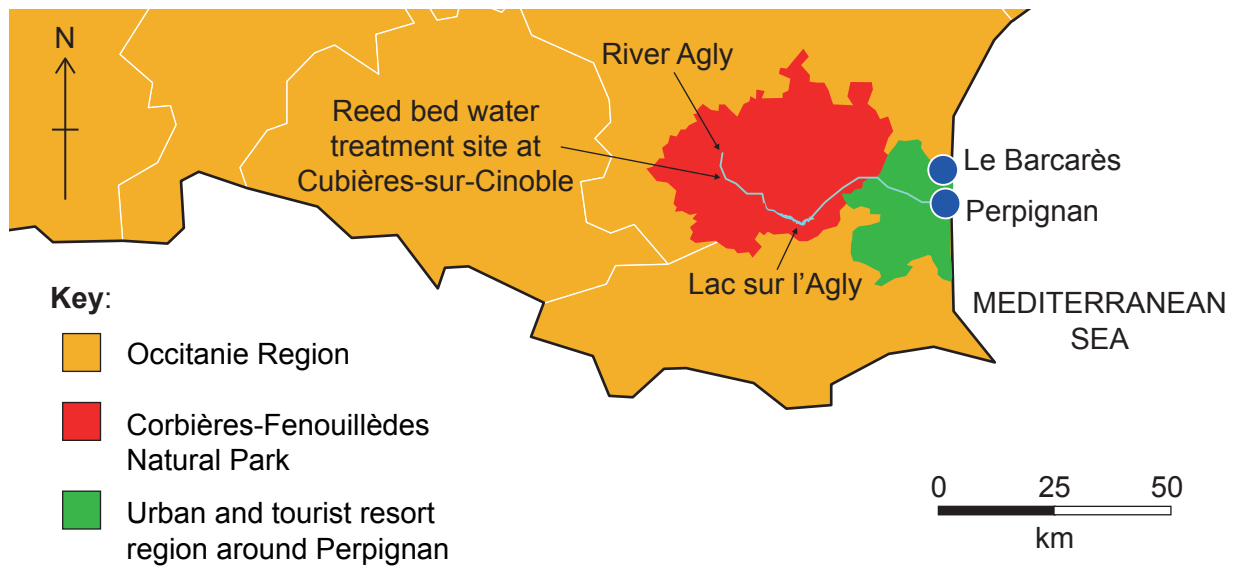


Figure 2(c): Fact file: River Agly and Lac sur l'Agly dam

- Lac sur l'Agly was constructed in 1994 as part of a regional water management initiative
- Designed for flood control in winter and as drinking water for Perpignan and the surrounding coastal areas in the high-demand summer tourist season
- Covers an area of 170 ha
- Surrounded by many walking paths used for recreation
- Used for recreational fishing
- In January 2023 and 2024, fish were removed from the river and transferred to the lake to protect them from an ongoing drought
- In years where there is limited winter rain, a build-up of organic matter occurs in both the lake and river, causing algal blooms

Figure 3(a): Sources of energy used in France, 2024

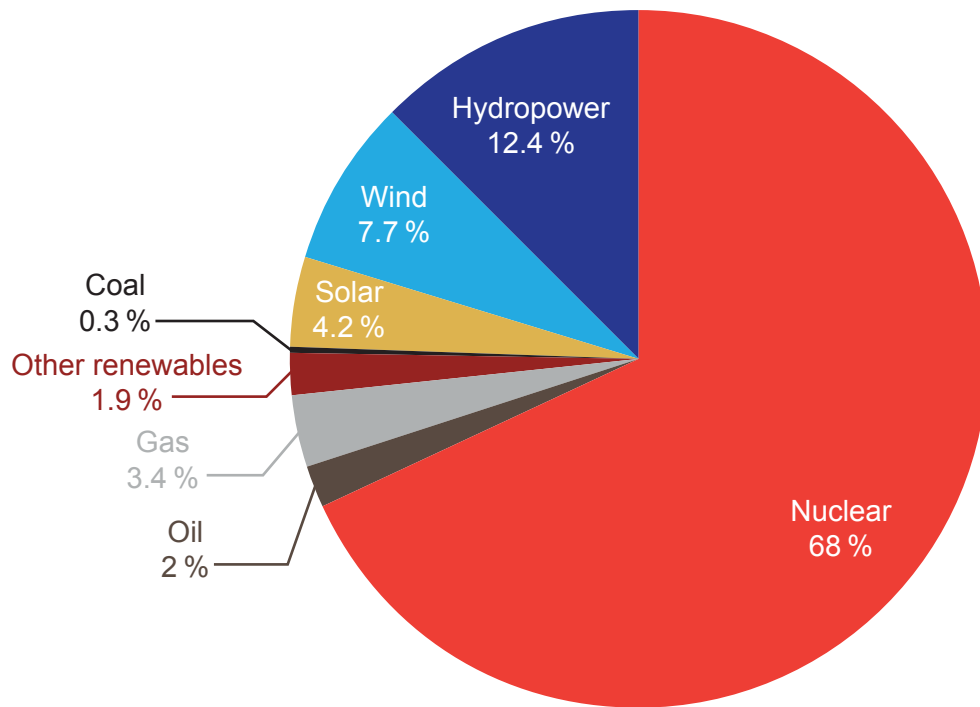


Figure 3(b): Energy fact file

- France generates over 550 TWh of electricity each year.
- The percentage share of energy consumption from fossil fuels has decreased from 95.8 % in 1965 to 5.7 % in 2024.
- The percentage share of energy consumption from renewables has increased from 10.3 % in 1965 to 26.2 % in 2024.
- The first nuclear power plant in France was built in 1962, and they now have 18 power plants.
- The French government banned hydraulic fracking for shale gas (methane) in 2011.
- Methane or natural gas is the cleanest form of fossil fuel, producing 50 % less carbon dioxide than coal and 30 % less than oil.

Figure 4(a): Fact file on demography of France, 2024

Total population	68 373 433
Birth rate	9.7 per 1000 people per year
Death rate	9.55 per 1000 people per year
Total fertility rate	1.82 children per woman
Life expectancy / years	82.82

Figure 4(b): Population pyramid for France, 2024

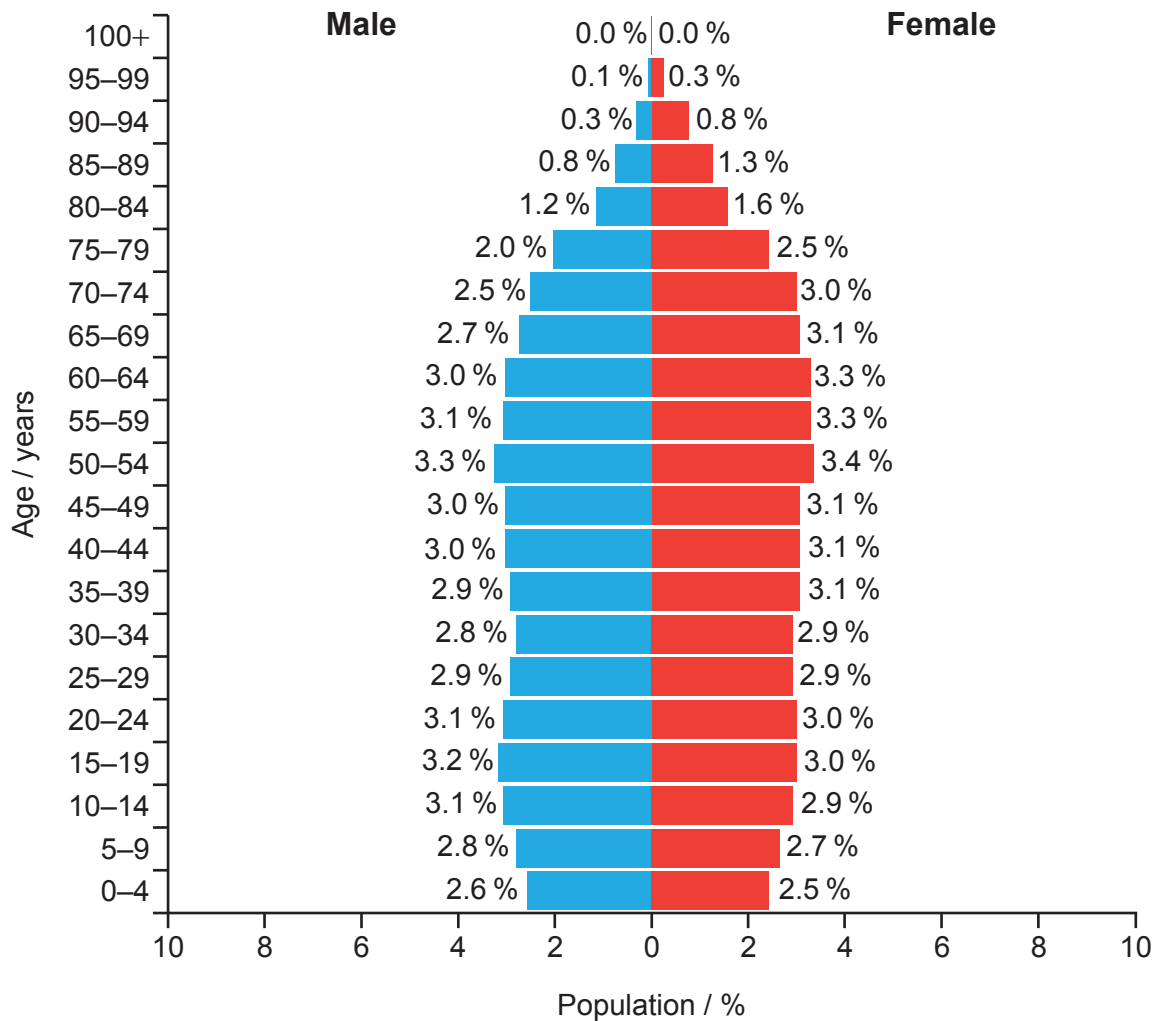


Figure 5(a): Food web of Corbières-Fenouillèdes Natural Park

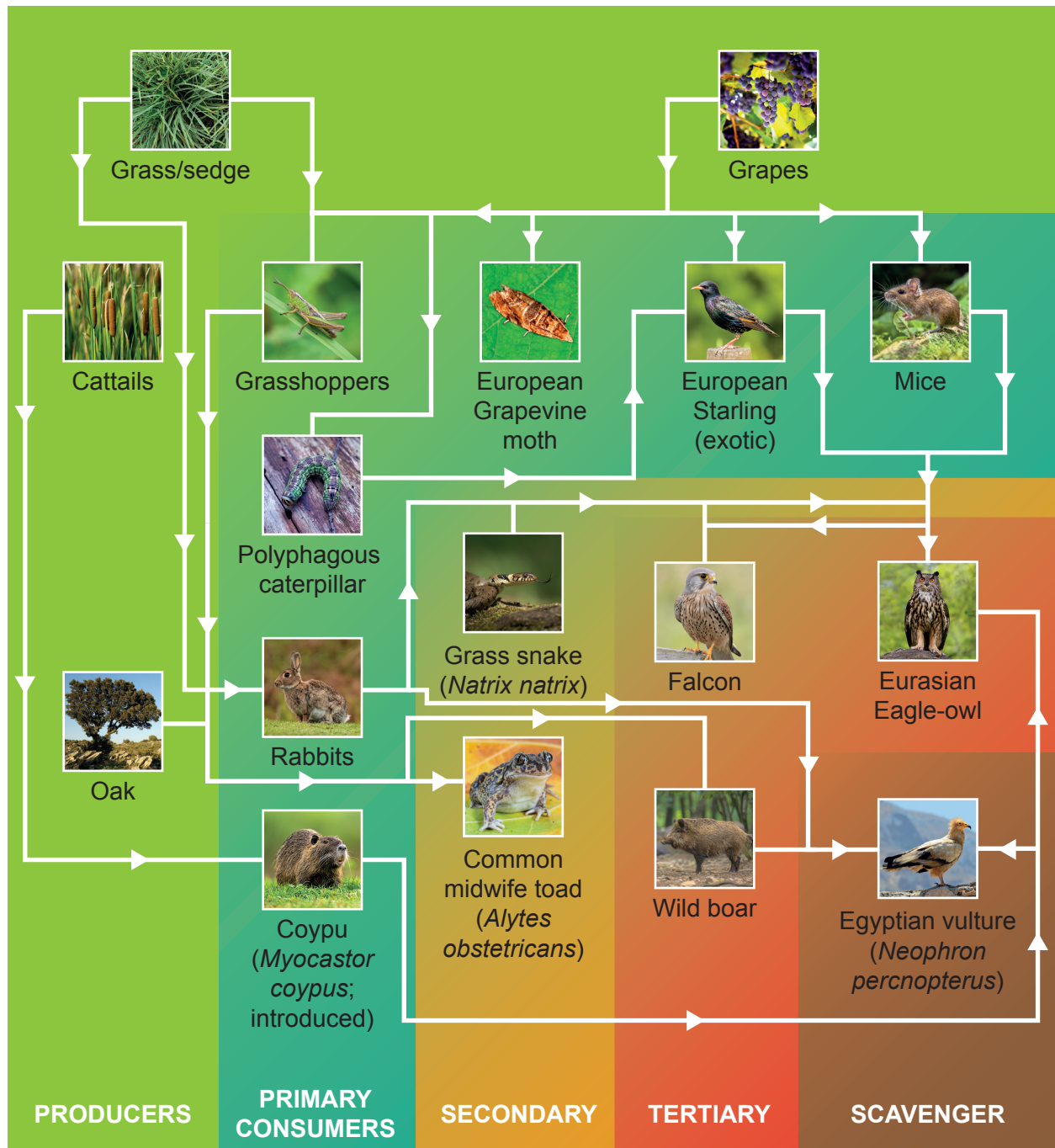
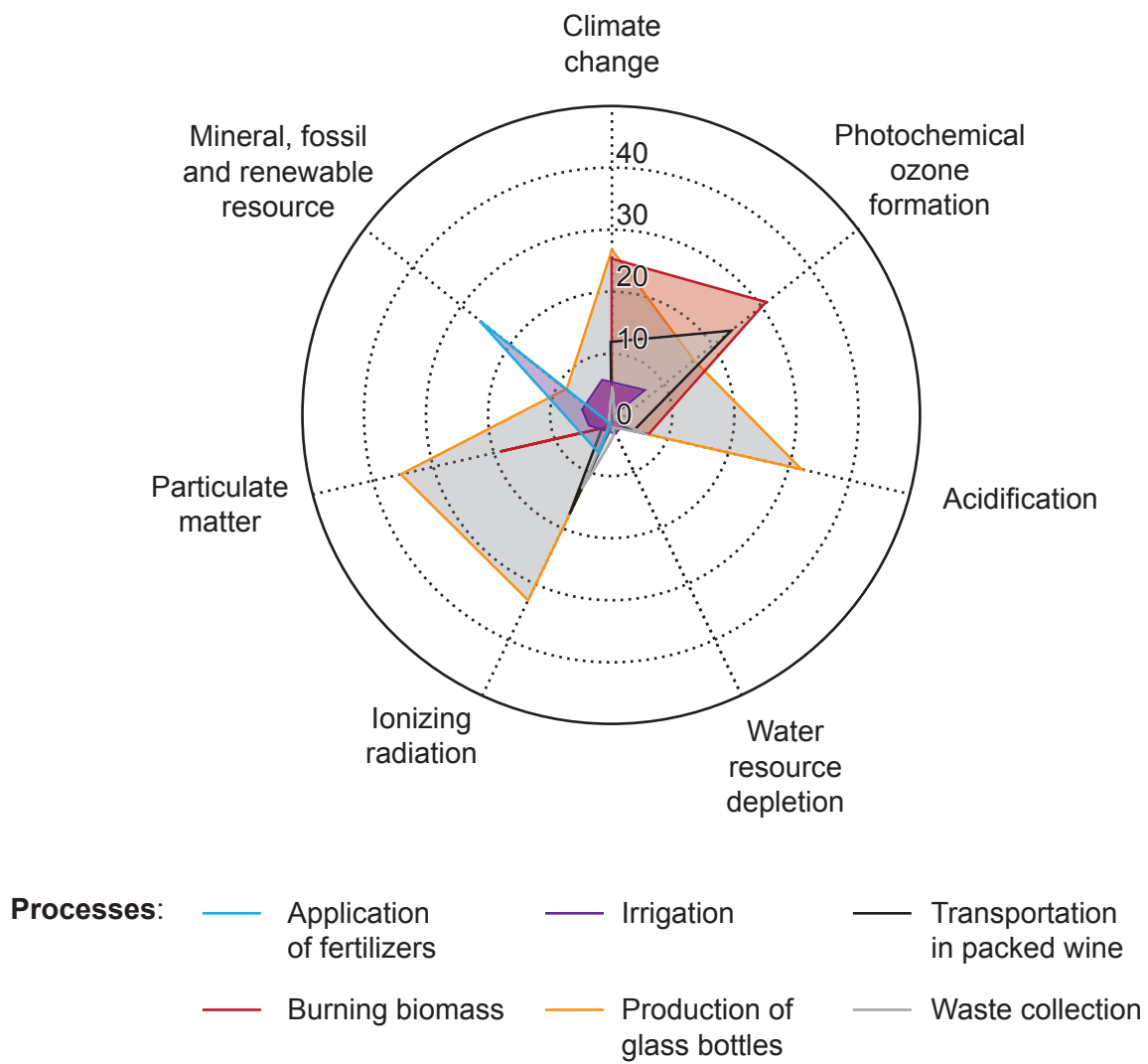


Figure 5(b): Fact file on coypu

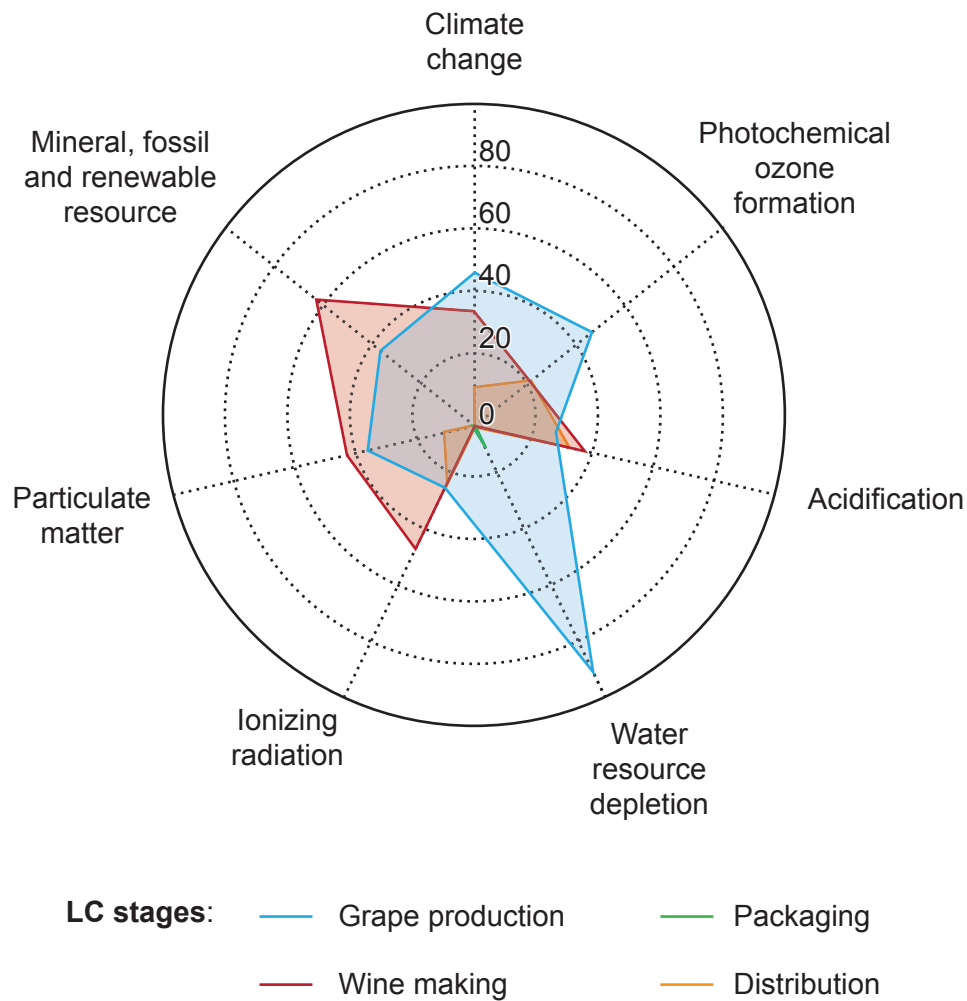
- Large semi-aquatic rodent native to south America
- Can weigh 5–9 kg and reach up to 1 metre in length
- Coypu were introduced to Europe in the 19th century for fur trading
- Economic costs of coypu globally are 19 billion USD, as estimated by Bonnet et al., from digging burrows that contribute to siltation and erosion from riverbank instability (2023)
- Feed on root crops and aquatic vegetation, including rare and threatened species
- Dense populations can alter native plants distribution in wetlands by consuming seedlings, altering vegetation succession and preventing natural re-vegetation

Figure 6(a): Radar diagram of environmental effects from different processes



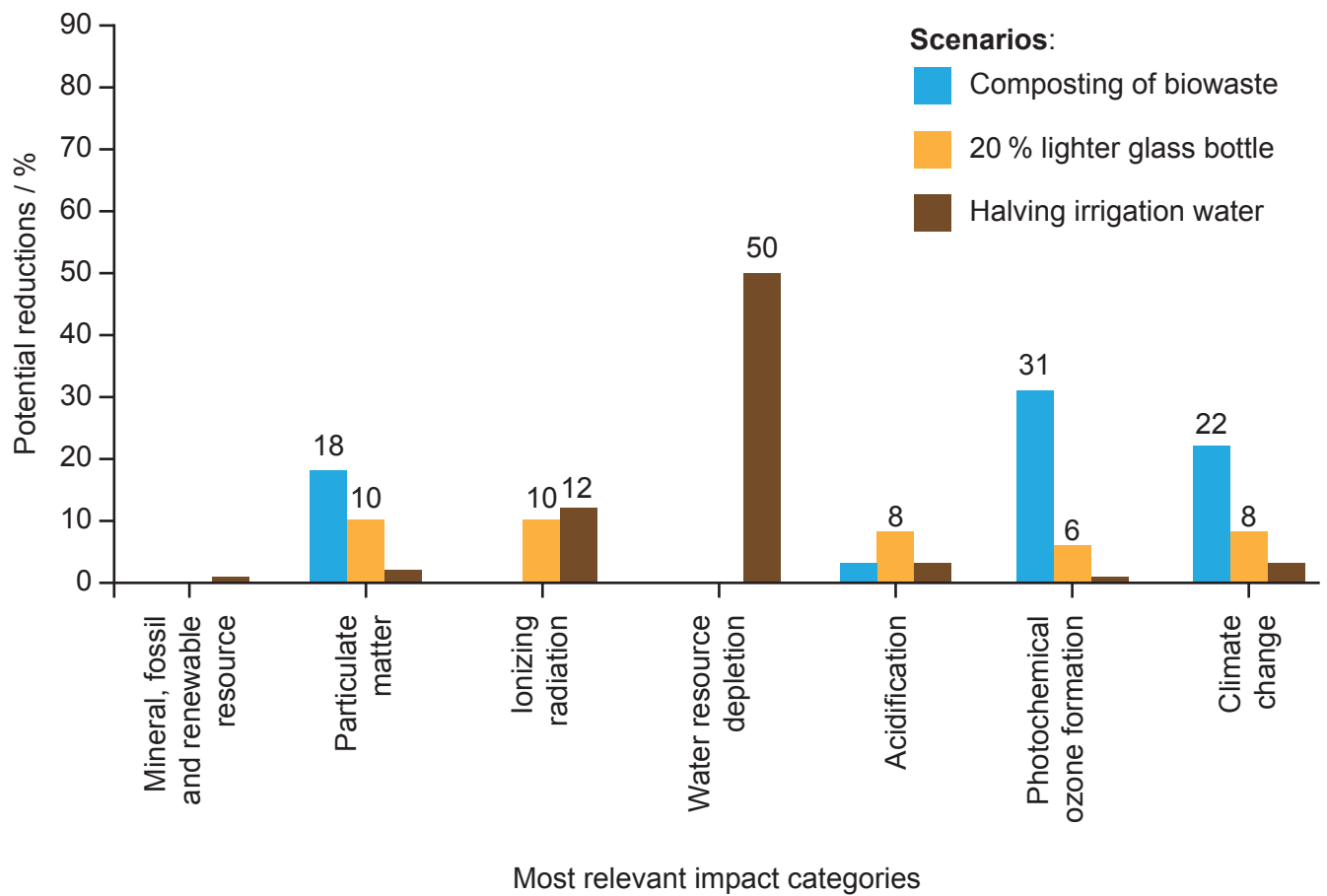
[Source: Used with permission of Springer Nature BV, from Improving environmental performance in wine production by life cycle assessment: case of Lebanese wine. Harb, W., Zaydan, R. & Vieira, M. *The International Journal of Life Cycle Assessment* 26, 1146–1159 (2021); permission conveyed through Copyright Clearance Center, Inc.]

Figure 6(b): Radar diagram for life cycle (LC) stages contribution to environmental impact



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Figure 6(c): Comparison of impact of different scenarios on potential emissions reductions



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Figure 7(a): Egyptian vulture (*Neophron percnopterus*)



Figure 7(b): European Red List designation and niche characteristics of vultures in the Corbières-Fenouillèdes Natural Park

Common name	Scientific name	European Red List status	Habitat requirements	Nesting sites	Feeding
Cinereous vulture	<i>Aegypius monachus</i>	Critically Endangered	Woodland and forests as well as sparsely vegetated ecosystems	Solitary on trees	Carrion of medium to large animals – live prey rarely eaten
Bearded vulture	<i>Gypaetus barbatus</i>	Critically Endangered	Sparsely vegetated mountain areas above 1000 m	Solitary on rock ledges in the high mountains	Carrion, in particular bones and soft tissue – will occasionally hunt live mammals and birds
Egyptian vulture	<i>Neophron percnopterus</i>	Critically Endangered	Sparsely vegetated ecosystems of open hills and low mountains	Solitary on cliff ledges and rocky outcrops as well as ledges and tops of tall buildings	Feeds mainly on carrion but will also eat live prey, eggs, fish and even fruit
Griffon vulture	<i>Gyps fulvus</i>	Vulnerable	Sparsely vegetated mountain areas to semi desert	Breeds in colonies of up to 100 pairs on large cliffs and ravines	Forages for carrion in family groups

Figure 7(c): Number of breeding pairs of *Neophron percnopterus* in France between 1935 and 2011

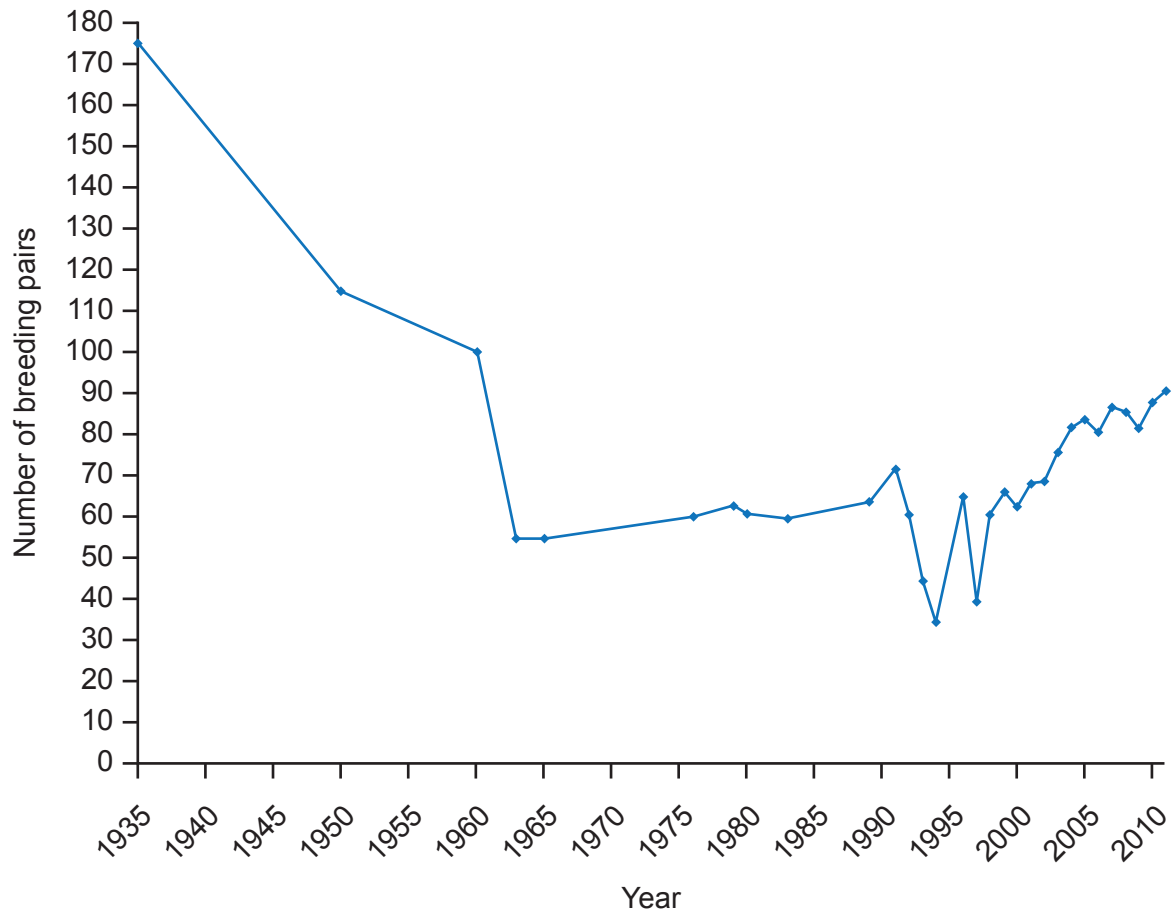


Figure 7(d): Fact File of Egyptian vulture (*Neophron percnopterus*)

Range	Large geographic range across Africa, India, the Mediterranean and Middle East
Habitat	Sparsely vegetated ecosystems
Food	Carrion (dead animals) – small rodents and reptiles to large farm animals; will also eat live prey, eggs, fish and even fruit
European population and conservation status	Migratory breeding population from Africa found mainly in Spain with small populations in France and Italy Endangered (IUCN Red List) across its entire range and Critically Endangered in Europe where it is protected by European Birds Directive and National Wildlife Protection law in France
Historic population	Declined rapidly in 20th century through persecution and accidental poisoning following increased use of pesticides after World War II
France and Spain	European population is mainly found in Spain with 1500 breeding pairs Two populations in France: Western Pyrenees, 50–60 breeding pairs. Small isolated populations in the Eastern Pyrenees and Alps – less than 12 breeding pairs
Threats	Land use change from declining livestock (animal) farming Accidental and illegal poisoning – 53 % of all vulture deaths from poisoning are the result of the use of banned pesticides
Bovine spongiform encephalopathy (BSE) – problem	Following the European outbreak of the disease bovine spongiform encephalopathy (BSE) in cattle, in the early 1990s, farmers across Europe were banned from leaving cattle and sheep, which had died naturally in fields, to decay and decompose – this removed a major food source for Egyptian vultures in conflict with the European Birds Directive

Figure 7(e): Conservation strategies for vulture populations in the south of France

In 2003, European Union Natura 2000 programme protected areas were set up to save the small Egyptian vulture population in the Corbières-Fenouillèdes region.

Six feeding stations were set up across the Mediterranean area to:

- minimize the effect of food source loss because of BSE
- help monitor the population for future conservation.

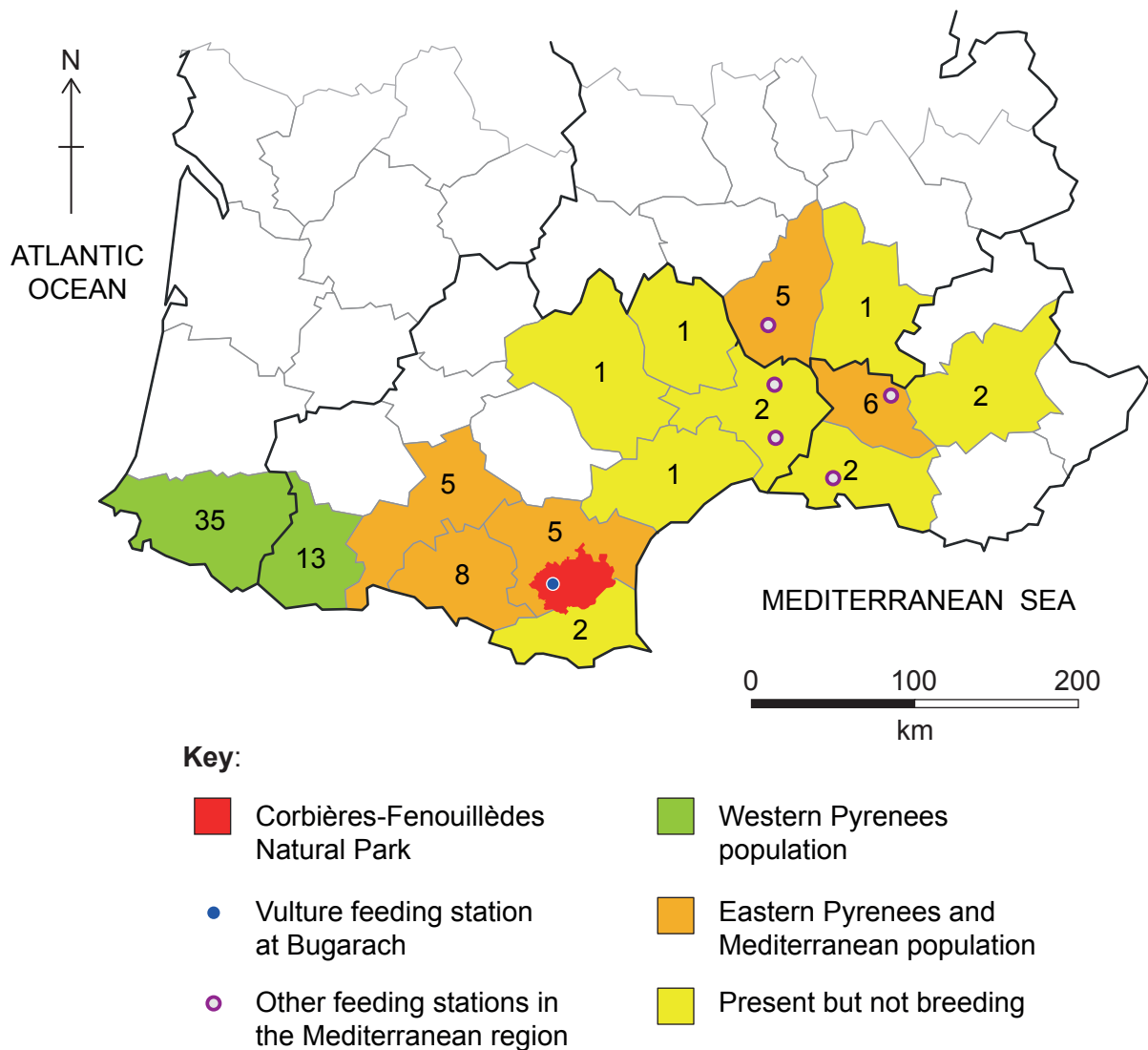
One is at Bugarach in the heart of the natural park – it also acts as an education centre.

The sites were established for the conservation of all vulture species in the region.

All sightings of vultures are logged using a GPS system.

Dead farm animals which have been tested by vets are placed out every day at each site.

Map of pairs of Egyptian vultures and feeding sites in the south of France:



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Figure 3(a):

"Energy consumption by source, France", part of the following publication: Hannah Ritchie, Pablo Rosado, and Max Roser (2023) - "Energy" Published online at OurWorldinData.org. Retrieved from: '<https://ourworldindata.org/energy>' [Online Resource]. Data by Energy Institute - Statistical Review of World Energy (2025) – with major processing by Our World in Data. Licensed under CC BY 4.0 <https://creativecommons.org/licenses/by/4.0/>. Source adapted.

- Figure 3(b):** "Data Page: Share of primary energy consumption from renewable sources", part of the following publication: Hannah Ritchie, Max Roser, and Pablo Rosado (2020) - "Renewable Energy" Published online at OurWorldinData.org. Retrieved from: 'https://ourworldindata.org/renewable-energy' [Online Resource]. Data source: Energy Institute - Statistical Review of World Energy (2025). Licensed under CC BY 4.0 <https://creativecommons.org/licenses/by/4.0/>. Source adapted.
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