

Exercise walk-through

2.2

Ecosystem Services

AP Environmental Science

Ecosystem services

Nature's free work for people, in four groups:

Provisioning

goods: food, water, wood

Regulating

clean air, flood control, pollination

Cultural

beauty, recreation, spirit

Supporting

soil, photosynthesis, cycling

A wetland that cleans water for free is worth the treatment plant we would otherwise build.

The four kinds of ecosystem service

provisioning

products taken directly: food, fresh water, timber, fibre

regulating

processes that keep conditions stable: climate regulation, water filtration, pollination, flood control

supporting

the ones the others rest on: soil formation, nutrient cycling, photosynthesis

cultural

non-material value: recreation, beauty, spiritual and educational worth

Anthropogenic

activity disrupts these, and the cost is **economic as well as ecological** – which is the point the essay question wants made.

Island biogeography, and what disturbs an ecosystem

island size

a **larger** island supports more species – more habitat, larger populations, lower extinction

distance

a **nearer** island receives more colonists from the mainland

so

big, near islands hold the most species; **small, remote** ones the fewest

isolation drives evolution

island species often become **specialists**, which makes them vulnerable to **invasive species**

zones of stress

at the edges of a species' tolerance range, where individuals survive but do not thrive or reproduce well

over geological time

climate has shifted for many reasons, and sea level has risen and fallen with the amount of glacial ice

Anthropogenic

activity disrupts ecosystem services at a **real economic and ecological cost** – losing pollinators forces farmers to pay for pollination.

Exercises 2.1-2.3

2.1 Name the four types of ecosystem service.

[2]

2.2 Classify “pollination of crops”.

[1]

2.3 Give one provisioning service.

[1]

Exercises 2.1-2.3

2.1 Name the four types of ecosystem service. [2]

2.1

- Provisioning, regulating, supporting, cultural
-

2.2 Classify “pollination of crops”. [1]

2.2

- Regulating
-

2.3 Give one provisioning service. [1]

2.3

- Any one: food, water, timber, medicine

Exercise 3.1

3.1 Water purification by a wetland is which type of service?

[1]

☐

A provisioning

B regulating

C supporting

D cultural

Exercise 3.1

3.1 Water purification by a wetland is which type of service?

[1]

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A provisioning

B regulating

C supporting

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3.1 B

- regulating

Exercise 3.2 (a)

3.2 A forest provides timber, stores carbon, and is used for hiking.

(a) Classify each of these three services.

[3]

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(a) Classify each of these three services.

[3]

(a)

- Timber = provisioning; carbon storage = regulating; hiking = cultural

Exercise 3.2 (b)

3.2 A forest provides timber, stores carbon, and is used for hiking.

(b) Explain why ecosystem services have economic value.

[1]

Exercise 3.2 (b)

3.2 A forest provides timber, stores carbon, and is used for hiking.

(b) Explain why ecosystem services have economic value.

[1]

(b)

- They provide things people would otherwise have to pay to produce or replace

Exercise 3.3

3.3 Explain why protecting a wetland can be cheaper than replacing its services artificially. [2]

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3.3

- The wetland naturally purifies water for free; replacing it with a treatment plant costs money to build and run, so conserving it is cheaper