



Cambridge International AS Level

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ENVIRONMENTAL MANAGEMENT

8291/22

Paper 2 Hydrosphere and Biosphere

May/June 2020

1 hour 30 minutes

You must answer **Section A** on the question paper and **Section B** on the answer booklet/paper you have been given.

You will need: Answer booklet/paper

INSTRUCTIONS

- Section A: answer **all** questions. Write your answer to each question in the space provided on the question paper.
- Section B: answer **one** question. Write your answer on the separate answer booklet/paper provided.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- You should show all your working and use appropriate units.
- At the end of the examination, fasten all your work together. Do **not** use staples, paper clips or glue.

INFORMATION

- The total mark for this paper is 80.
- The number of marks for each question or part question is shown in brackets [].

For Examiner's use	
Section A	/
1	
2	
Section B	/
Total	

This document has **12** pages. Blank pages are indicated.

Section A

Answer **all** questions in this section.

Write your answers in the spaces provided.

- 1 (a) Fig. 1.1 shows aerial views of the Theewaterskloof Dam and Reservoir near Cape Town, South Africa taken in 2011 and 2018.

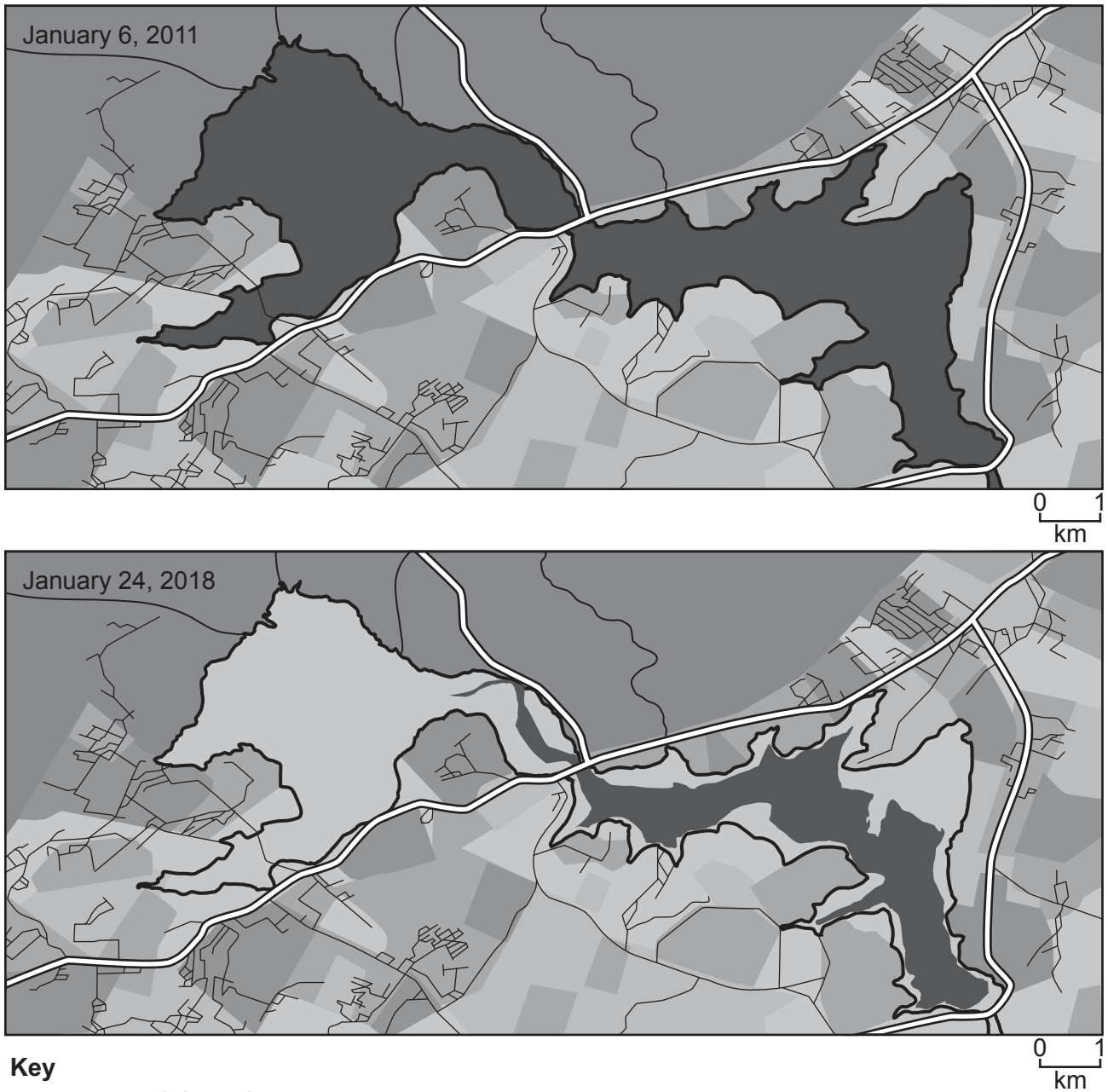


Fig. 1.1

- (i) Describe changes to the Theewaterskloof Dam and Reservoir shown in Fig. 1.1 between January 2011 and January 2018.

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.....
..... [2]

- (ii) Suggest **two** causes of the changes to the Theewaterskloof Dam and Reservoir shown in Fig. 1.1.

Give reasons for your answer.

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..... [4]

- (iii) Describe **two** effects on the local habitats as a result of the changes to the Theewaterskloof Dam and Reservoir shown in Fig. 1.1.

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..... [4]

(b) In 2018 Cape Town was close to running out of water.

(i) Suggest strategies which the population and the authorities of Cape Town might have used in an attempt to conserve the rapidly diminishing water supply.

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..... [4]

(ii) Describe the advantages and disadvantages of building dams to create reservoirs for the supply of water to cities such as Cape Town.

advantages

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disadvantages

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[6]

[Total: 20]

2 (a) Fig. 2.1 shows the distribution of the tundra biome.

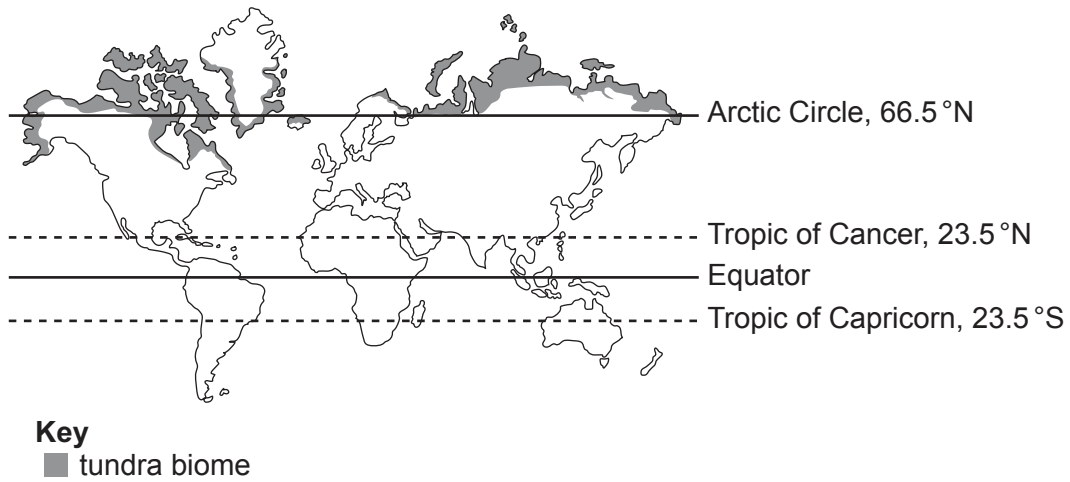


Fig. 2.1

(i) Describe the distribution of the tundra biome shown in Fig. 2.1.

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..... [2]

(ii) State the two main abiotic factors which contribute to the distribution of the tundra biome shown in Fig. 2.1.

1

2

[2]

(b) Fig. 2.2 is a food chain found in the tundra biome.



Fig. 2.2

(i) State what is represented by the arrows in the food chain shown in Fig. 2.2.

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..... [2]

(ii) Suggest why food chains in the tundra biome are short.

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..... [2]

(c) Fig. 2.3 is an extract from a local news webpage.

With more people moving to the tundra to work in mines and on oil rigs, more towns and roads have been built. The building of other structures, such as the Trans-Alaska Oil Pipeline, have caused disruption to species such as the Arctic Wolf. In addition, pesticides have been used to control large swarms of insects, which migrating birds rely on for food in the tundra.

Fig. 2.3

(i) Suggest **three** ways in which human activities in Fig. 2.3 have caused disruption to the habitat of the Arctic Wolf.

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..... [3]

(ii) Explain why the use of pesticides to control insect populations might lead to the death of Arctic birds of prey.

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..... [3]

(d) Fig. 2.4 is an extract from an environmental journal.

Permafrost is a characteristic of the tundra biome. The soil is frozen to a considerable depth meaning that trees cannot grow there. The permafrost acts as a store of water, methane and carbon dioxide.

The winter months of January and February 2018 saw a change in weather patterns with unusually high temperatures in the arctic tundra, leading to melting of some of the permafrost.

Fig. 2.4

Explain how the melting of some of the permafrost might affect coastal communities and global weather patterns.

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..... [6]

[Total: 20]

Section B

Answer **one** question from this section.

Write your answers on the separate answer paper provided.

- 3 Fig. 3.1 is a graph showing the different stages in human population growth (a demographic transition model).

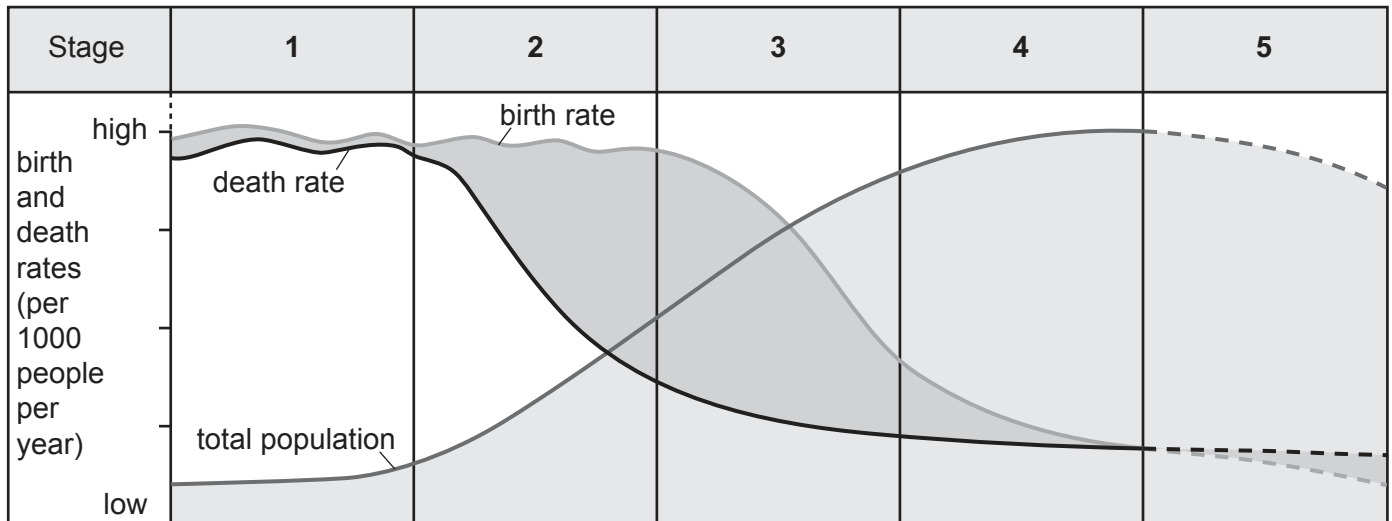


Fig. 3.1

- (a) Describe the different stages in the human population graph (demographic transition model) shown in Fig. 3.1. [10]
- (b) Evaluate the different strategies used to control the size of the human population in countries with contrasting levels of economic development. [30]

[Total: 40]

- 4 Fig. 4.1 is a series of maps showing the spread of lionfish, an invasive marine species, following the release of a single pair in Florida, USA in 1985.

The lionfish is native to the coasts of Indo-Pacific Asia.

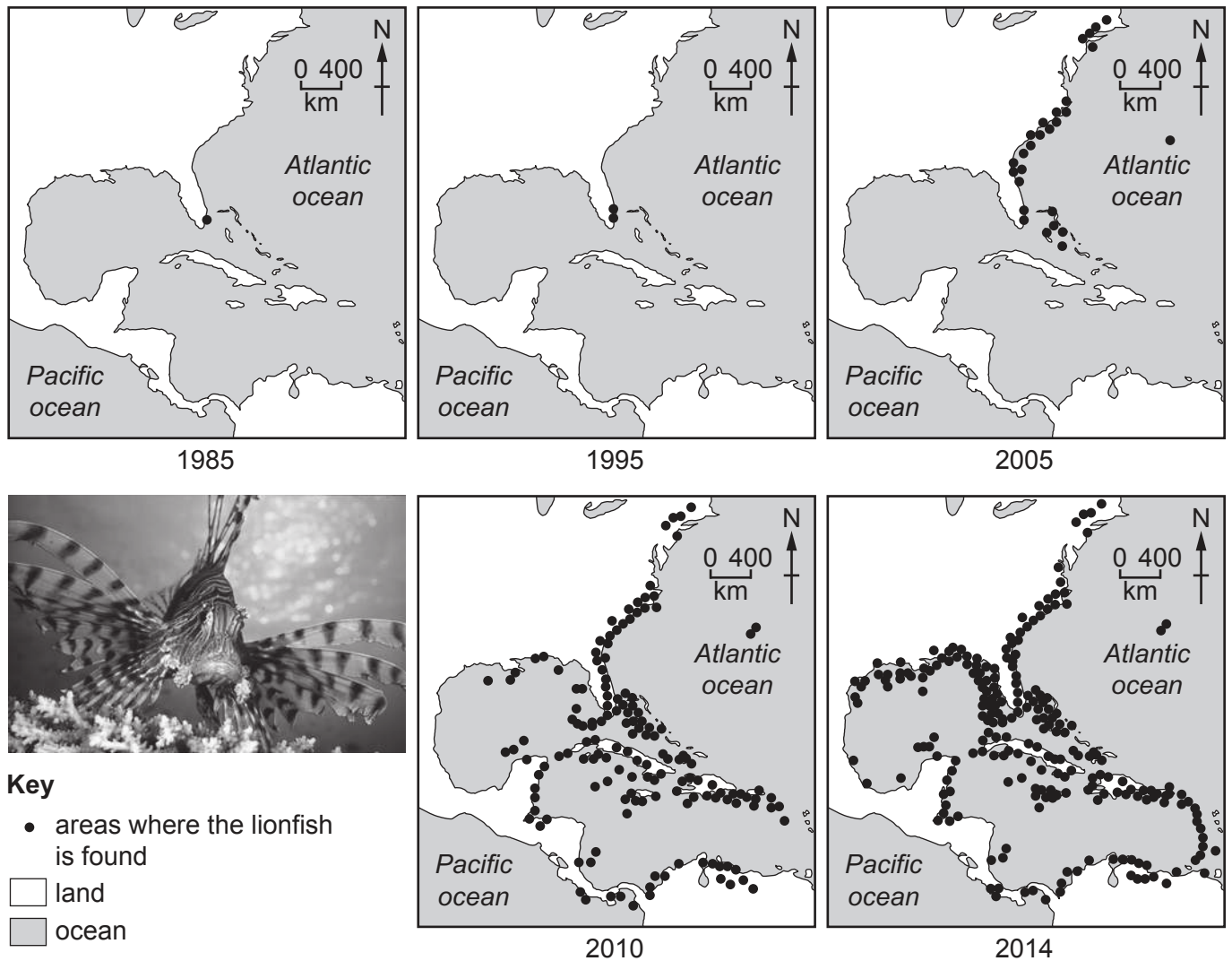


Fig. 4.1

- (a) Describe the spread of the lionfish shown in Fig. 4.1. [10]
- (b) Explain how an invasive fish species such as the lionfish can cause disruption to the habitat and to native species. Assess strategies used to manage the control of invasive species in different habitats. [30]

[Total: 40]

5 Fig. 5.1 is a suggested model for the establishment of marine conservation areas worldwide.

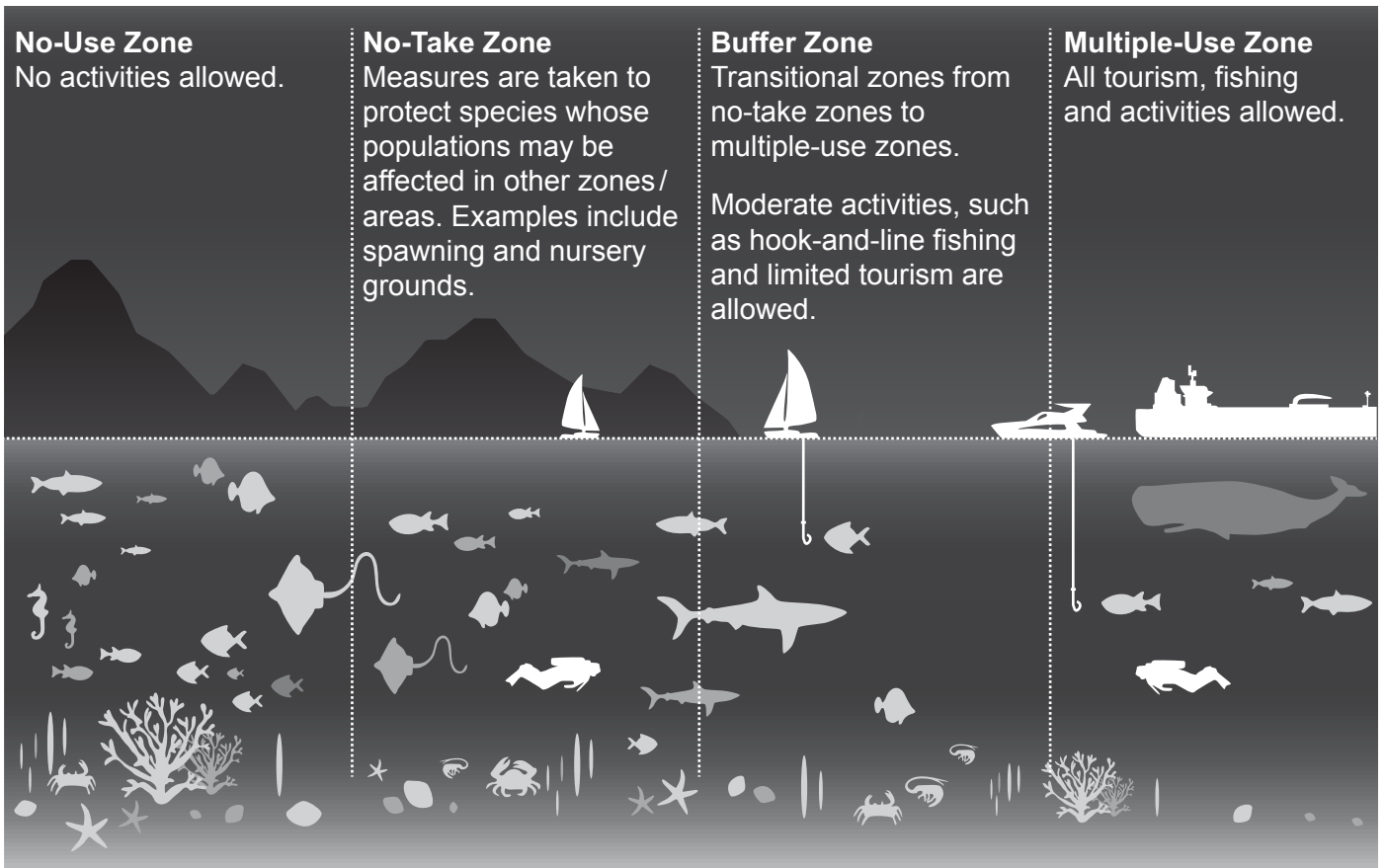


Fig. 5.1

(a) Describe and explain how each of the four zones in the suggested model shown in Fig. 5.1 will contribute to marine conservation. [10]

(b) The control of marine pollution is a big factor in the success of marine conservation.

Evaluate different strategies used to manage the causes and effects of marine pollution. [30]

[Total: 40]

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