LUI | | | | | | | | | | | School code | | | | |

School name

Given name/s

Family name

Attach your barcode ID label here

Book of books used

External assessment 2025

Question and response book

Marine Science

Paper 1

Time allowed

- Perusal time — 10 minutes
- Working time — 90 minutes

General instructions

- Answer all questions in this question and response book.
- QCAA-approved calculator permitted.
- Planning paper will not be marked.

Section 1 (20 marks)

- 20 multiple choice questions

Section 2 (24 marks)

- 7 short response questions

Clear zone — margin trimmed off after completion of assessment

Queensland Government | QCAA Queensland Curriculum & Assessment Authority

DO NOT WRITE ON THIS PAGE

THIS PAGE WILL NOT BE MARKED

Section 1

Instructions

- This section has 20 questions and is worth 20 marks.
- Use a 2B pencil to fill in the A, B, C or D answer bubble completely.
- Choose the best answer for Questions 1–20.
- If you change your mind or make a mistake, use an eraser to remove your response and fill in the new answer bubble completely.

	A	B	C	D
Example:	●	○	○	○

	A	B	C	D
1.	○	○	○	○
2.	○	○	○	○
3.	○	○	○	○
4.	○	○	○	○
5.	○	○	○	○
6.	○	○	○	○
7.	○	○	○	○
8.	○	○	○	○
9.	○	○	○	○
10.	○	○	○	○
11.	○	○	○	○
12.	○	○	○	○
13.	○	○	○	○
14.	○	○	○	○
15.	○	○	○	○
16.	○	○	○	○
17.	○	○	○	○
18.	○	○	○	○
19.	○	○	○	○
20.	○	○	○	○

Ensure you have filled an answer bubble for each question.

Do not write outside this box.

Section 2

Instructions

- Write using black or blue pen.
- If you need more space for a response, use the additional pages at the back of this book.
  - On the additional pages, write the question number you are responding to.
  - Cancel any incorrect response by ruling a single diagonal line through your work.
  - Write the page number of your alternative/additional response, i.e. See page …
  - If you do not do this, your original response will be marked.
- This section has seven questions and is worth 24 marks.

QUESTION 21 (3 marks)

a) Identify a source of atmospheric carbon and a carbon sink. *[2 marks]*

Carbon source: _____

Carbon sink: _____

b) Identify an abiotic factor in the ocean that is influenced by the concentration of atmospheric carbon dioxide. *[1 mark]*

_____

Do not write outside this box.

QUESTION 22 (1 mark)

Identify the ions used by coral to build their skeletons.

QUESTION 23 (2 marks)

Describe two conditions necessary for a bleached reef to recover.

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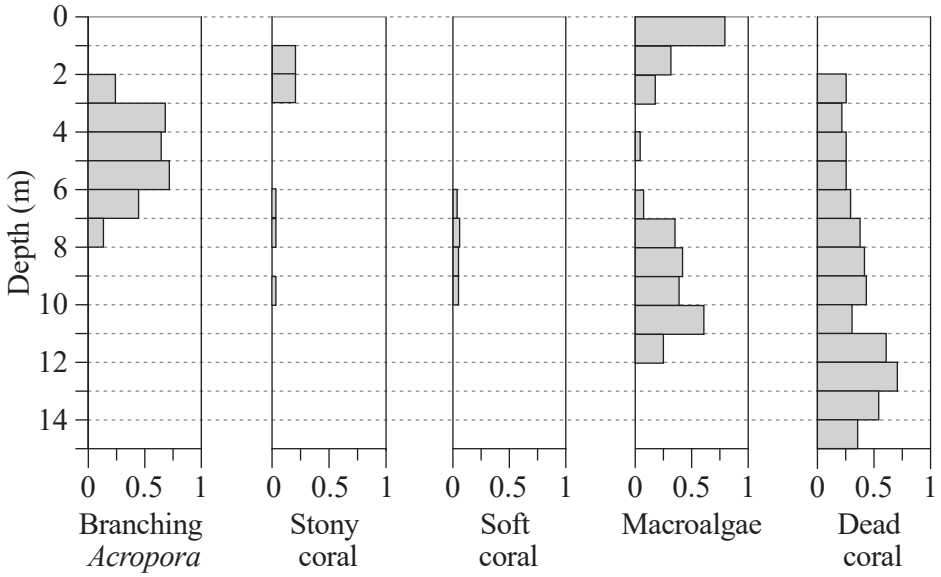
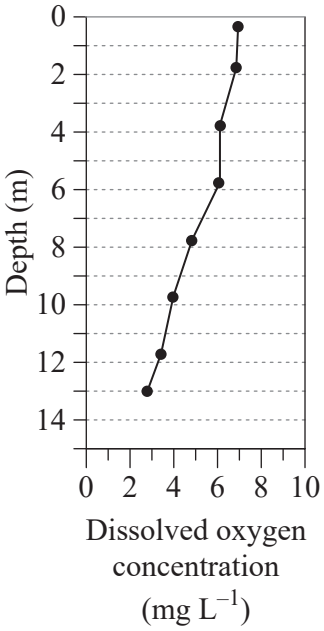
QUESTION 24 (5 marks)

The first graph shows the relative abundance of different reef species observed at different depths on a coral reef. The second graph shows the concentration of dissolved oxygen measured at different depths on the same reef.





a) Identify the range in depth where branching *Acropora* were seen. *[1 mark]*

b) Identify a trend in dissolved oxygen concentration. *[1 mark]*

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c) Draw a conclusion about dissolved oxygen concentration and the abundance of living coral. Justify your conclusion with data from both graphs. *[3 marks]*

QUESTION 25 (2 marks)

Over the past 25 years, some fish populations in coastal Australian waters have extended from subtropical areas into more temperate waters.

Explain why this change in distribution has occurred.

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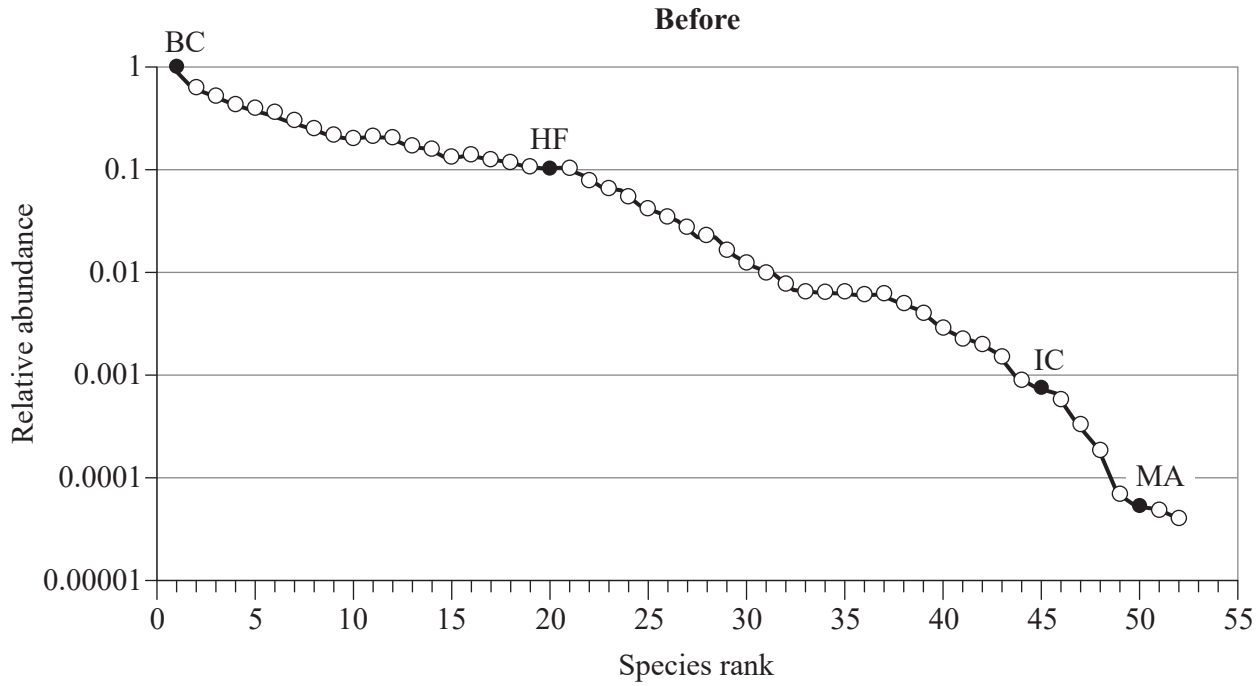
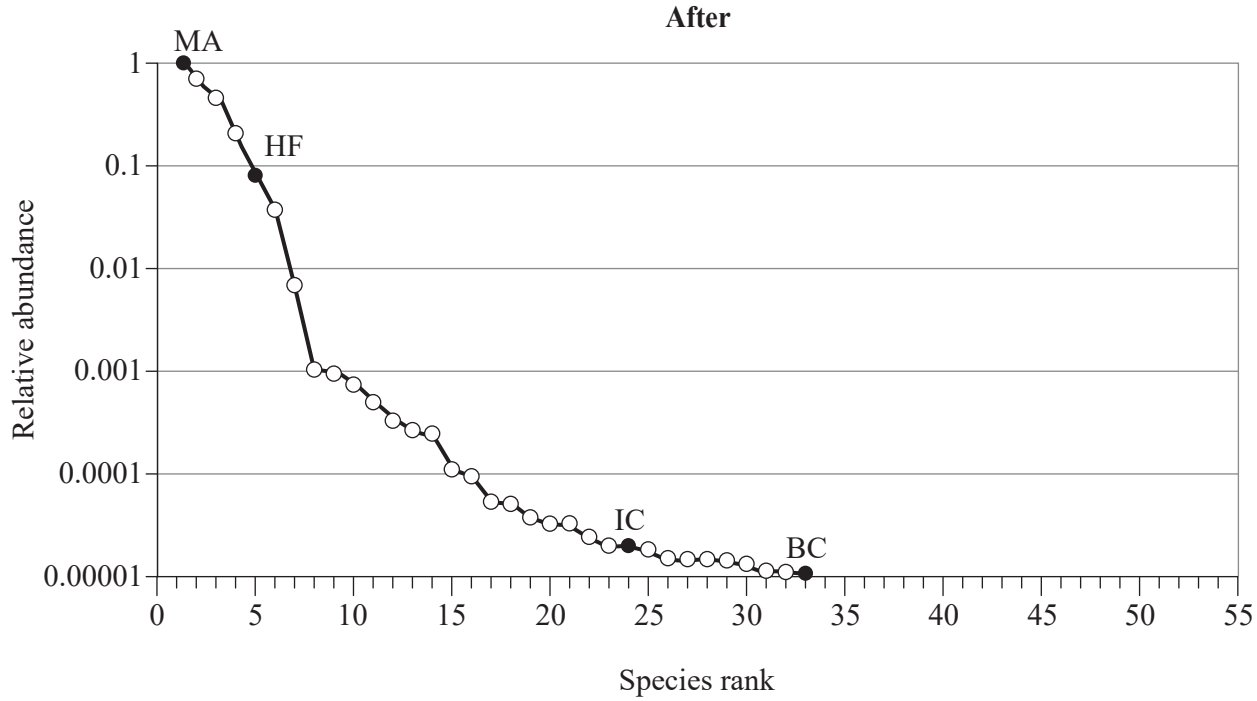
QUESTION 26 (6 marks)

The graphs show the species rank and relative abundance of species on a reef before and after overfishing. Four representative species are also shown.



Key				
	BC	Branching coral	HF	Herbivorous fish
	IC	Invertebrate corallivore	MA	Macroalgae



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a) Identify the change in highest-ranking species after overfishing. *[1 mark]*

b) Contrast the species diversity of the reef before and after overfishing. *[2 marks]*

c) Infer how future species rank and relative abundance data could be used to determine if the reef does or does not show hysteresis. Show your reasoning. *[3 marks]*

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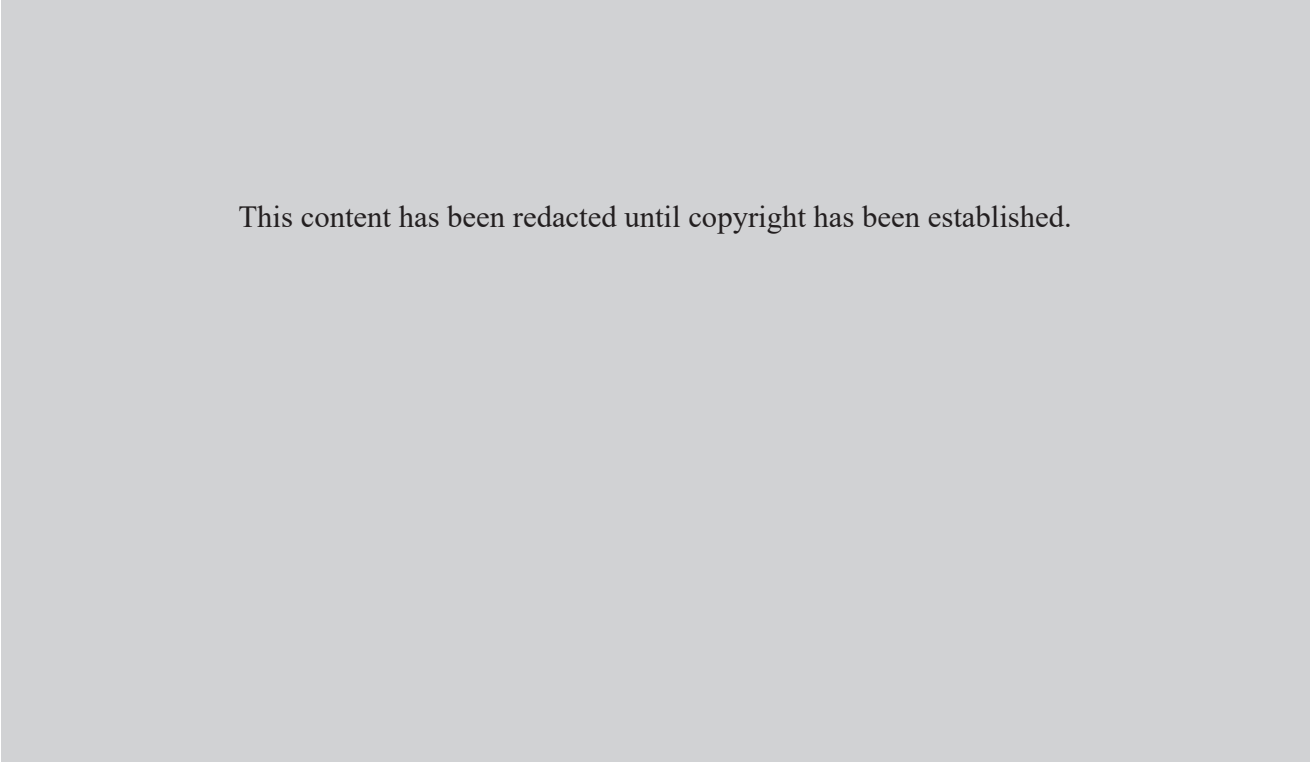
QUESTION 27 (5 marks)

The map shows the zones in a section of the Great Barrier Reef: no-take marine reserves (NTMR); habitat protection zones, which are open to fishing; and general use zones, which have few restrictions.



a) Identify a criterion used to design the protected marine areas. *[1 mark]*

b) Explain how the criterion identified in Question 27a) applies to coral trout species in this region. *[2 marks]*

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c) Identify a management strategy that would help maintain the coral trout population in the habitat protection zones. Show your reasoning. *[2 marks]*

END OF PAPER

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ADDITIONAL PAGE FOR STUDENT RESPONSES

Write the question number you are responding to.

Do not write outside this box.

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References

Question 23

Blakeway D 2018, 'Hypoxia shapes coral reefs', *Peer Journal Preprints*, https://doi.org/10.7287/peerj.preprints.26794v1.

Question 27

Great Barrier Reef Marine Park Authority 2016, 'Great Barrier Reef marine park zoning map 12 - Mackay', https://elibrary.gbrmpa.gov.au/jspui/retrieve/58ddc5f0-1c17-426a-900a-b2f09b53823c/WEB_Map12_Merge.pdf

Data and information provided in this paper may have been developed or adjusted for exam purposes and should not be taken as factual.