



PRAWN FISHING AND MARINE PROTECTED AREAS

Teacher Resources - Lesson Plan

SYLLABUS OBJECTIVES

MARINE & MARITIME STUDIES

Western Australia School Curriculum

Marine and Maritime Studies - Year 11 syllabus for teaching from 2026

Unit 1 — Environmental and Resource Management

- Issues related to Western Australian fisheries:
 - management
 - control of fishing efforts
 - sustainable yields
- Rules and regulations relating to Western Australian commercial fisheries

Unit 2 — Environmental and Resource Management

- Marine protected areas, marine parks, reserves and sanctuary zones:
 - importance and examples

Unit 2 — Science as a Human Endeavour

- Scientific systems are reviewed based on new information and evidence.
- Classification and monitoring systems help scientists identify and communicate information about organisms.

RESOURCE OVERVIEW

In this lesson for ages 14+ learners explore how science and adaptive management practices improve sustainability in the Exmouth Gulf Prawn Fishery.

Key terms

- Commercial Fishery
- Marine Protected Area
- Sanctuary Zone
- Seasonal closure
- Nursery habitat
- Harvest strategy
- Endangered, Threatened, and Protected (ETP) species
- Bycatch
- Adaptive management

You will need

- Printed copies of pages 5-8
- Digital screen or board for class discussion (optional)
- Student pen and paper for Activity 4
- Access to or digital copy of Appendixes 4 and 5 (pages 56-59) in [Prawn Resource of Exmouth Gulf Harvest Strategy : 2021-2026](#)

Key concepts

- Sustainable fisheries require rules, monitoring, compliance and adaptive decision-making.
- The Exmouth Gulf Prawn Fishery uses permanent nursery closures, seasonal closures, full moon closures, limited entry, gear restrictions, habitat mapping, Vessel Monitoring Systems, bycatch monitoring and recovery strategies.
- Fishing areas open and close based on recruitment surveys, spawning surveys, commercial catch rates, and prawn size.
- If stock levels fall below safe limits, recovery strategies and restrictions can be activated.

Class activities

- Students describe key sustainability initiatives used in the Exmouth Gulf Prawn Fishery.
- Students explain how scientific surveys and real-time data inform management decisions.
- Students compare different management tools, including closures, gear restrictions, effort controls, VMS and bycatch monitoring.
- Students apply a harvest-control decision-making process to a fictional fishery scenario.

LESSON PLAN



Teachers Notes

In this lesson, students learn about a sustainable prawn fishery on the Exmouth Gulf which works in harmony with marine protected areas, seasonal closures, and nursery areas. The Exmouth Gulf Prawn Fishery provides a strong example of sustainable fisheries management because it combines ecological knowledge, scientific monitoring, regulation and adaptive decision-making.

A central idea for students is that sustainability is not achieved through one rule alone. Instead, it depends on a connected system: protecting juvenile prawns, protecting spawning adults, monitoring habitats, reducing bycatch, enforcing closures, responding to scientific data and adjusting fishing effort when risk increases. These combined measures make for a useful case study of adaptive management in practice.

Activity 1: Introducing the Exmouth Gulf Prawn Fishery

Show students [Captain Len's video](#) about the Exmouth Gulf Prawn Fishery (06:11).

Test student listening:

- Len the skipper says that the fishery have improved their fishing gear to make sure that what kind of species escape unharmed? (hint: E_____, T_____, and P_____)
- Who does the fishery collaborate with to improve their practices?
- Len says that the Exmouth Gulf Prawn Fishery is proof that commercial fishers can coexist with which kind of special areas in the ocean?

Activity 2: Management Tools Matrix

Students identify how different fisheries management tools or measures are useful, by completing a matrix. Students follow the examples given, and suggest one trade-off for each adaptive measure.

Activity 3: Marine Protected Areas and Commercial Fishing

Len says that commercial fishers operate successfully alongside marine parks like the Ningaloo Marine Park, Gascoyne Marine Park, and Muiron Marine Islands Management Area. See the map of marine parks on page 8. The Western Australian Government has now announced a new Marine Protected Area will be created across the Exmouth Gulf, jointly managed with Traditional Owners. Students read this ABC news article from September 2025 about the new Exmouth Gulf Marine Park: [WA government announces long-promised Exmouth Gulf Marine Park](#). Fishing regulations are still being worked out for the new marine park, with 30 percent to be allocated as a 'sanctuary zone'. No fishing can take place in sanctuary areas. To better understand fishery management decisions and closures for a sustainable harvest, students split into groups and play a game of 'Open, delay, or close' (page 4). Student present the outcome of one scenario to the class, with a justification, and discuss.





Activity 4: Reflection

Students write a short reflection on three questions

1. How are fishery closures similar to marine protected areas, reserves or sanctuary zones?
2. Why might a sustainable fishery need both fishing rules and habitat protection?
3. How do commercial fishers and scientists collaborate for the health of the marine ecosystem?

Activity 5: ADVANCED - Mapping prawn habitats

Students download a copy of the [Prawn Resource of Exmouth Gulf Harvest Strategy : 2021-2026](#) and use

Appendixes 4 and **5** at the end of the document (pages 56 to 59) to find where different prawn species and lifestages (larvae, juvenile, spawners) are most likely to be found in the Exmouth Gulf. Students mark out these prawn species and habitats on a map of the fishery, (lesson page 10).

MANAGEMENT TOOLS IN THE EXMOUTH GULF

Fill out the matrix of management tools by ticking the columns where management tools are useful, and suggesting a possible trade-off or 'cost' of each management measure

Management Tool	Description	Protects prawns	Protects habitat	Protects other species	Uses scientific data	Possible trade-off
Permanent nursery area	No fishing allowed in juvenile prawn habitats	✓	✓	✓	✓	Less area available to fish
Seasonal closures	Fishing closed during certain months of the year	✓			✓	Shorter fishing season
Area-based closures	Areas open or closed based on health of prawn population and habitat	✓	✓	✓	✓	Rules can change during season
Recruitment surveys	Measures juvenile prawn population					
Adult prawn surveys	Measures population of breeding adults - prawn 'spawning stock'					
Limited fishing licences	Cap of 15 commercial fishing licences					
Habitat mapping	Identifies sensitive habitats and Vulnerable Marine Ecosystems					
Trawl footprint monitoring	Tracks the spatial areas where fishing occurs.					
Bycatch reduction devices	Prevents unwanted species from accidentally being caught					
ETP species monitoring	Records interactions with protected species.					
Sea snake capture and release	Fishers record information about sea snake interactions for scientific studies					
Vessel Monitoring System (VMS)	Tracks location of fishing vessels					
Recovery Strategy	Activates if prawn population declines.					
Sanctuary zone	No-take zones within marine parks					
Catch rate data	Assesses health of prawn population based on fisher data					
Full moon closures	Reduces fishing pressure around full moon times.					



OPEN, DELAY, OR CLOSE

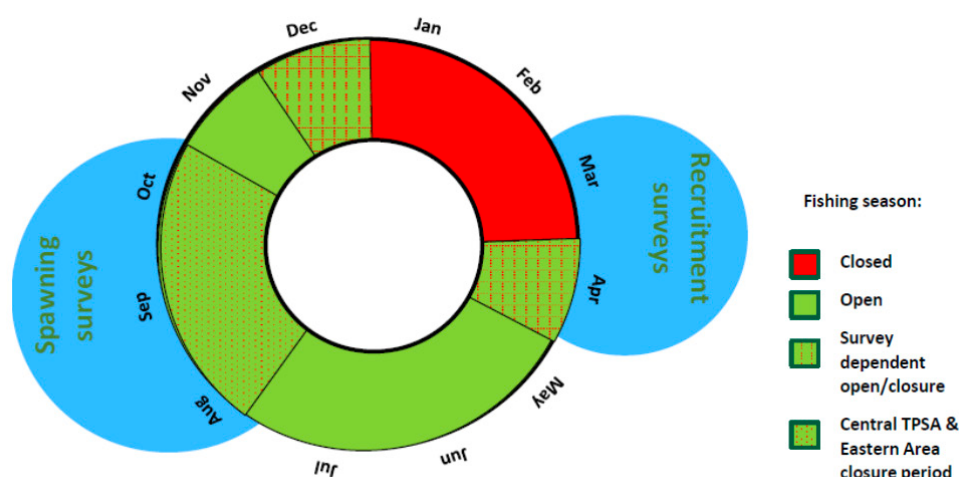
Sustainable fishing in the Exmouth Gulf is supported by fishery closures. Approximately 21% of the Gulf containing sensitive habitats is permanently closed, and approximately 88% of identified Vulnerable Marine Ecosystems (VME) are protected. There are different kinds of closures - permanent, seasonal, and temporary closures. Closures can be area-based (spatial) or time-based (temporal). In this exercise, students imagine that scientific survey has just been completed on the Exmouth Gulf using fishing catch data and habitat monitoring. Students work in small groups to act as a fishery management committee. Read over the 6 scenarios, with different indicators about the health of the fishery.

For each scenario, choose one of the following actions:

- Open fishing area
- Delay opening
- Open with restrictions
- Close area early
- Keep area closed
- Activate recovery strategy

The committee must justify their decision using at least three management principles:

- protect juvenile prawns
- protect spawning stock
- maintain sustainable yield
- reduce bycatch
- protect sensitive habitats
- follow scientific survey data
- apply precautionary management
- comply with fishery rules



Fishing Seasons and Scientific Surveys

The prawn fishing season in Exmouth Gulf spans from April to December, with two annual surveys of prawn 'recruitment' (juvenile prawns) and 'spawning' (breeding adult prawns). Managers adjust the season opening and closing dates, depending on lunar phases and survey results.

Image credit and Source: [Western Australia Department of Fisheries, 2021](https://www.wa.gov.au/government/departments/western-australia-department-of-fisheries)

The committee will present the outcome of **one scenario** to the class.

Example: The survey results show that recruitment of juvenile prawns is low, but the adult population is strong and the catch rate is high. Average prawn size is mixed, bycatch interactions are low, and habitat concern is low. **Recommended action:** Delay opening the fishing season. **Justification:** The main risk shown from this survey is that juvenile recruitment numbers are low. Delaying the fishing season is a form of precautionary management. Following scientific data, this action will allow prawns additional time to breed, protecting the spawning stock, and boosting juvenile recruitment for future years.

OPEN, DELAY, OR CLOSE

Scenarios A, B, C

Indicator	Scenario A	Scenario B	Scenario C
Juvenile prawn recruitment	High	Medium	Low
Adult prawn population	Healthy	Borderline	Low
Fisher catch rate	Strong	Declining	Poor
Average prawn size	Large	Mixed	Small
Bycatch interactions	Low	Moderate	Increasing
Habitat concern	Low	Moderate	High

Scenarios D, E, F

Indicator	Scenario D	Scenario E	Scenario F
Juvenile prawn recruitment	High	Medium	High
Adult prawn population	Borderline	Healthy	Low
Fisher catch rate	Strong	Strong	Declining
Average prawn size	Large	Small	Mixed
Bycatch interactions	Moderate	Low	Low
Habitat concern	Low	Low	High



EXMOUTH GULF FISHERY MAP

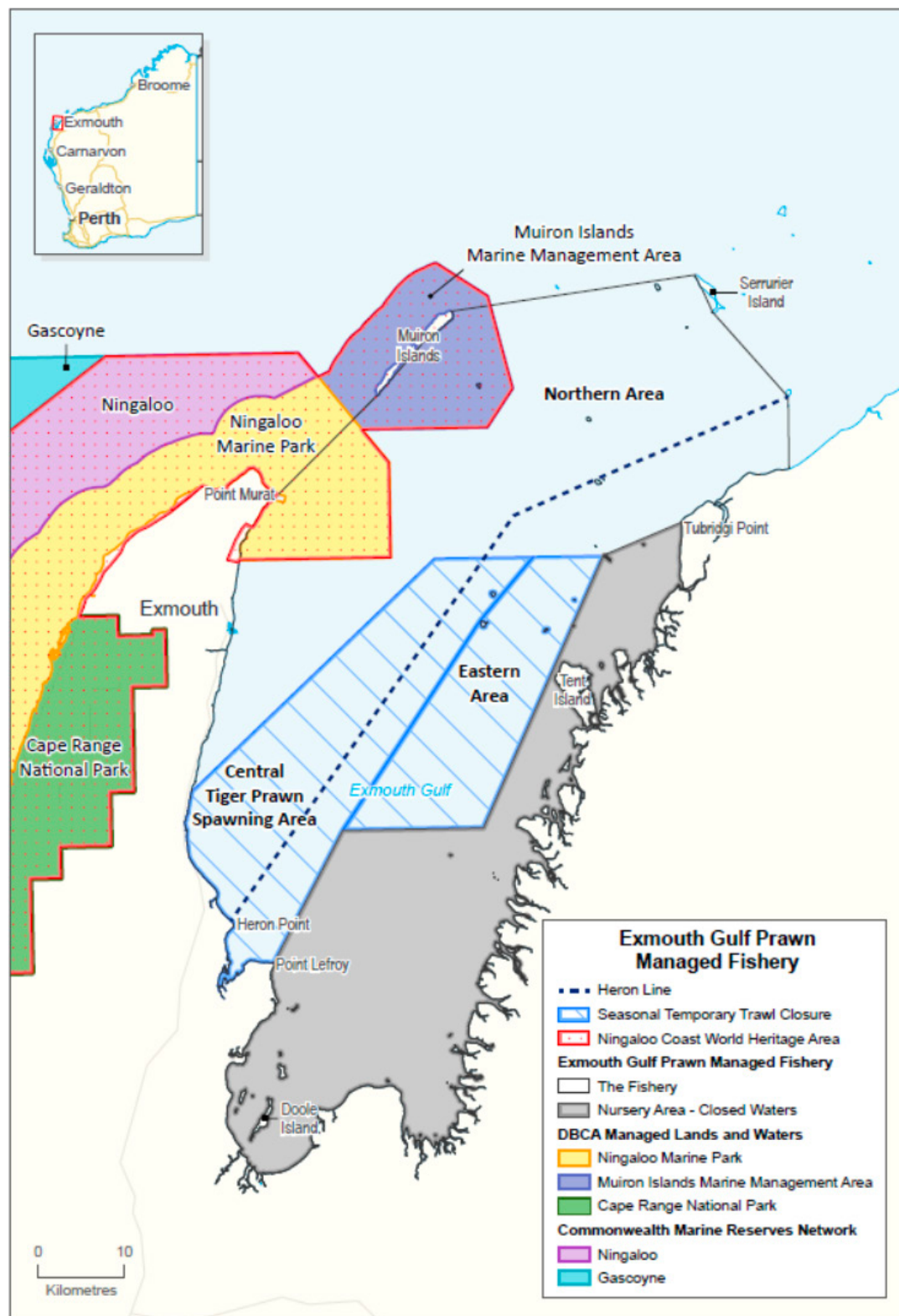


Figure 1: Exmouth Gulf Prawn Managed Fishery management areas, boundaries and adjacent areas of significance.

Activity 2: Management Tools Matrix

Note: Answers are not fixed - the table below is intended only as a suggestion and basis for class discussion

Management Tool	Description	Protects prawns	Protects habitat	Protects other species	Uses scientific data	Possible trade-off
Permanent nursery area	No fishing allowed in juvenile prawn habitats	✓	✓	✓	✓	Less area available to fish
Seasonal closures	Fishing closed during certain months of the year	✓			✓	Shorter fishing season
Area-based closures	Areas open or closed based on health of prawn population and habitat	✓	✓	✓	✓	Rules can change during season
Recruitment surveys	Measures juvenile prawn population	✓			✓	Cost and time to survey
Adult prawn surveys	Measures population of breeding adults - prawn 'spawning stock'	✓			✓	Results may delay fishing
Limited fishing licences	Cap of 15 commercial fishing licences	✓				Limits who can fish commercially
Habitat mapping	Identifies sensitive habitats and Vulnerable Marine Ecosystems	✓	✓	✓	✓	Requires regular updating
Trawl footpring monitoring	Tracks the spatial areas where fishing occurs.	✓	✓	✓	✓	Requires regular assessment
Bycatch reduction devices	Prevents unwanted species from accidentally being caught			✓	✓	Additional reporting for fishers
ETP species monitoring	Records interactions with protected species.			✓	✓	Interactions may still occur
Sea snake capture and release	Fishers record information about sea snake interactions for scientific studies			✓	✓	Interactions may still occur
Vessel Monitoring System (VMS)	Tracks location of fishing vessels		✓	✓		Requires monitoring and enforcement
Recovery Strategy	Activates if prawn population declines.	✓	✓	✓	✓	May reduce fishing income in short term
Sanctuary zone	No-take zones within marine parks	✓	✓	✓	✓	May reduce fishing income
Catch rate data	Assesses health of prawn population based on fisher data	✓			✓	Accurate reporting required
Full moon closures	Reduces fishing pressure around full moon times.	✓			✓	Shorter fishing season



Activity 1: Video - Exmouth Gulf Prawn Fishery

Len the skipper said that the fishery have improved their fishing gear to make sure that what kind of species escape unharmed?

Endangered, Threatened, and Protected

Who does the fishery collaborate with to improve their practices, and how?

University researchers, by sharing data from their fishing activities

Len says that the Exmouth Gulf Prawn Fishery is proof that commercial fishers can coexist with which kind of special areas in the ocean?

Marine Protected Areas

Activity 4: Reflection

1. How are fishery closures similar or different to marine protected areas?

Fishery closures and marine protected areas both restrict human activities at specific sites to protect marine life and habitats. Fishing can take place within some marine protected areas, but not within sanctuary zones. In the Exmouth Gulf Prawn Fishery, permanent nursery areas protect juvenile prawns and sensitive habitats, while seasonal and adaptive closures protect adult prawns and breeding cycles. These closures are similar to protected areas because they limit fishing pressure in ecologically important places. They are also different to marine protected areas because they are short-term protective measures that respond to continual changes in the marine environment.

2. Why might a sustainable fishery need both fishing rules and habitat protection?

Fishing rules control how much, when and where fishing happens, while habitat protection safeguards the places that marine organisms need to grow, feed, and reproduce. A fishery could have low catch limits but still be unsustainable if nursery habitats, seagrasses, or sponge gardens were damaged. In Exmouth Gulf, sustainability depends on protecting prawns as well as their habitats to ensure the health of future prawns, the food web, and the entire marine ecosystem that supports them.

3. How do commercial fishers and scientists collaborate for the health of the marine ecosystem?

Science is used by people to make decisions about real-world environmental problems. In the Exmouth Gulf, scientists collect data through prawn surveys, habitat mapping, catch monitoring and ecological risk assessments. Fishers contribute data from their activities about the number and size of prawns that they catch, as well as any bycatch interactions, to support scientific analysis. Managers use this evidence to decide whether protected areas should open, close, or have restrictions.