# WHERE PRAWNS GROW ON THE EXMOUTH GULF

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 — Oceanography**

- Features of Western Australian ocean currents and identification on maps, including:
  - Leeuwin Current
  - West Australian Current
  - South Equatorial Current
- Methods used to measure surface current speed and direction and tides

**Unit 2 — Oceanography**

- Location and characteristics of ocean zones:
  - intertidal
  - continental shelf
  - pelagic
  - deep sea
- Adaptations of marine organisms living within these zones
- Classification of marine organisms based on habitat and motility:
  - plankton
  - nekton
  - benthos
- Food chains and webs relevant to ocean zones studied

**Unit 2 — Science as a Human Endeavour**

- Classification systems allow scientists to identify and communicate information about organisms.

# RESOURCE OVERVIEW

In this lesson for ages 14+ learners explore how ocean currents, habitats, and food webs shape prawn life cycles in Exmouth Gulf, and why this ecological knowledge is important for sustainable fisheries.

## Key terms

- Prawn larvae
- Juvenile prawn
- Leeuwin Current
- West Australian Current
- South Equatorial Current
- Continental shelf
- Pelagic zone
- Benthic zone
- Nursery habitat
- Primary producer
- Consumer
- Predator

## You will need

- Printed copies of pages 5-8
- Student paper and pen or art materials for Activity 4
- Digital screen or board for class discussion (optional)
- Examples or images of oceanographer tools for Activity 3 (optional)

## Key concepts

- Ocean currents influence movement of larvae, nutrients, water temperature and productivity.
- Prawns use different habitats at different life stages.
- Juvenile prawns grow in inshore nursery areas before migrating offshore to spawn. The fishery protects these nursery areas through permanent closures.
- Habitat mapping helps protect sensitive habitats including seagrass, sponge gardens, coral reef and Vulnerable Marine Ecosystems (VME).
- Classification systems help scientists communicate ecological roles and habitats.

## Class activities

- Students will identify key Western Australian currents and describe how currents and tides may influence prawn movement, larvae, productivity and fishing patterns.
- Students describe key habitat zones in and around Exmouth Gulf and classify organisms as plankton, nekton or benthos.
- Students explain why protecting nursery habitats is important for the sustainability of the Exmouth Gulf Prawn Fishery.
- Students connect prawn life stages to management practices such as nursery closures, spawning protection and scientific surveys.

# LESSON PLAN

## Activity 1: Why the Gulf?

Distribute a copy of the worksheet on page 5, with a map of the Western Australian coast.
Ask students:

- Why might Exmouth Gulf be a productive place for prawns?
- What oceanographic features might influence marine life here?

Ideas may include:

- currents
- tides
- prawn nursery areas
- shallow water
- seagrass
- continental shelf
- spawning areas
- fishing zones
- protected areas

## Activity 2: Mapping the Gulf

Students work in pairs to label the map, using information from the :

- Leeuwin Current
- West Australian Current
- South Equatorial Current
- Exmouth Gulf
- Continental shelf
- Possible prawn nursery and spawning areas

Students fill in the questions at the bottom of the map.

- Which current flows southward along the WA coast?
- Which current is generally associated with cooler northward flow?
- How might currents affect larvae, nutrients, temperature, and the abundance of prawns?

## Activity 3: An oceanographer's toolkit

Oceanographers, fishers, and fisheries scientists use a range of tools to measure activity in the ocean. In this activity, students match seven monitoring technologies to what they could measure.
Students answer questions on

- How might currents or tides affect a prawn fishery?
- Which tool would be most useful for understanding how prawns move through Exmouth Gulf?

## Activity 4: Where do prawns grow on the gulf?

Students use the table to identify different organisms in the Exmouth Gulf, their roles, and primary habitats. Students then draw or create using art materials their own version of the ecosystem, showing habitat areas and predator-prey relationships, including humans.

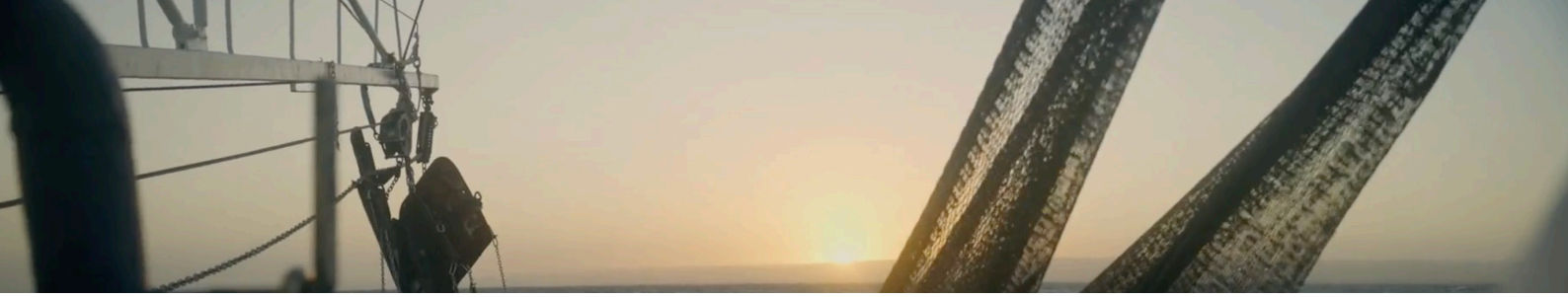
## Activity 5: Prawn Fishing in the Gulf

Introduce the idea that fisheries are not just about catching fish - they are managed through knowledge of oceanography, ecology, life cycles, habitats, and human decision-making. A fishery can affect habitats, unwanted bycatch species, and protected species.

Discuss as a class:

- Why might juvenile prawns need protected nursery areas?
- Why might adult prawns be managed differently from juveniles?
- Why are seagrass, sponge gardens and coral communities important even if they are not the target species?
- What could happen to a fishery if nursery habitats are damaged?

**Answers are on pages 8 & 9**



## Label these features on the map:

Leeuwin Current, West Australian Current, South Equatorial Current, Exmouth Gulf.


## Questions

1. Which current flows southward along the WA coast?

2. Which current is generally associated with cooler northward flow?

3. How might currents affect nutrients, temperature, and the movement of prawns?

# An Oceanographer's Toolkit

Match each tool to what is measures by drawing a line.

| Tool | Measures |
|---|---|
| Drifter Buoy | Ocean colour, water movements in real time |
| GPS Float | Sea surface temperature, ocean colour, current patterns |
| Tide gauge | Surface current speed and direction |
| Satellite imagery | Current speed and direction at different depths |
| Acoustic Doppler Current Profilers | Movement of water over time |
| Local vessel observations | Tide height |

## Questions

1.How might currents or tides affect a prawn fishery?

2. Which tool would be most useful for understanding how prawns move through Exmouth Gulf? Explain.

# EXMOUTH GULF FOOD WEB

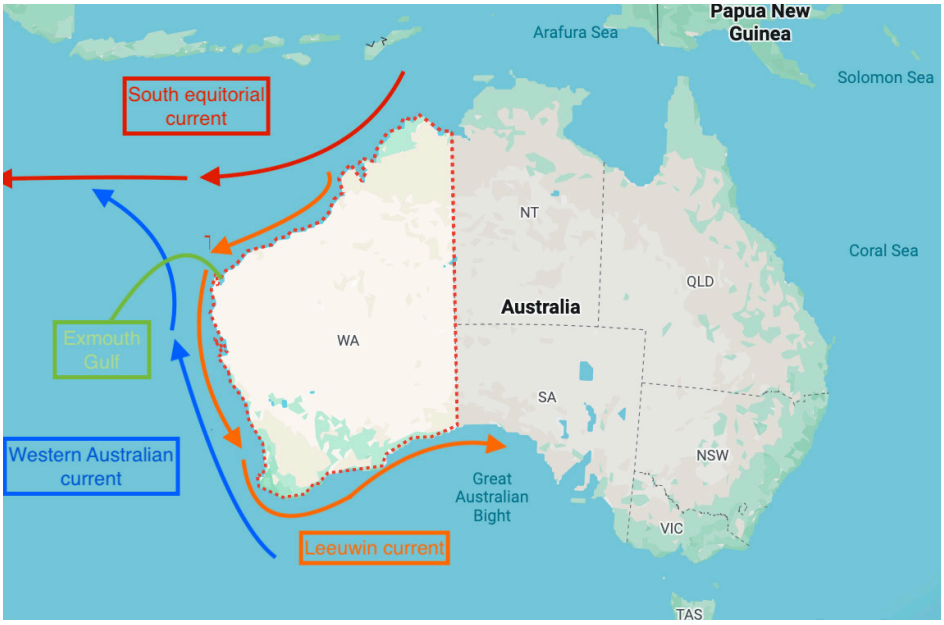
| Organism | Habitat zone | Role |
|---|---|---|
| Prawn larvae | Pelagic / water column. Larvae drift with currents and tides | Consumer of plankton; Prey for small fish, jellyfish, |
| Juvenile prawns | Inshore nursery habitats / seagrasses / shallow sea floor | Consumer of algae, detritus, invertebrates; Prey for squid, juvenile sharks, octopuses, and estuarine fish |
| Adult prawns | Continental shelf / benthic habitats. Adult prawns live on or near the sea-floor and migrate offshore to spawn. | Consumer of detritus, benthic worms, snails, molluscs; Prey for large fish, sharks, rays, sea snakes, cephalopods |
| Seagrass | Intertidal / shallow subtidal | Provides nursery habitat and food web support. |
| Sea snakes | Pelagic / benthic coastal waters. Actively swim in open waters | Burrow hunters of eel, gobies, prawns, crustaceans, and turtle eggs; Prey for sharks, large fish, raptor sea birds |
| Benthic invertebrates (e.g. worms, bivalves, small crabs, sea stars) | Seafloor / benthic zone | Filter feeders, scavengers, sea floor gardeners |
| Phytoplankton | Pelagic / water column | Primary producer - Foundation of the food web; Consumed by zooplankton, prawns, manta rays, whale sharks. |
| Marine turtles | Pelagic / coastal / benthic-feeding areas. Active swim-mers | Consumer of seagrasses, sponges, benthic invertebrates; Prey for sharks. Nutrient transporters between sea and land. A protected species. |
| Dolphins | Pelagic / coastal waters | Apex predators. Consumers of fish, cephalopods, crustaceans. A protected species |
| Sponge gardens | Benthic zone | Filter-feeder habitat, water purification |
| Sea horses & pipe fish | Seagrass beds | Consumers of prawn larvae; Prey for estuary fish, birds, sea snakes. An indicator species for water quality. |

## Did you know?

Prawns are most active at night, when they are safer from predators like sharks and octopus. During the day they stay buried in sand or hidden in seagrasses. They emerge at night to forage and hunt. For the best chance of catching prawns, fishers in the Exmouth Gulf work from sunset to sunrise - especially during the dark phases of the moon!

# ANSWERS

## Activity 2: Mapping ocean currents




**Which current flows southward along the WA coast?**

Leeuwin current

**Which current is generally associated with cooler northward flow?**

Western Australian current

**How might currents affect nutrients, temperature, and the movement of prawns?**

- Currents can influence where plankton and nutrients are concentrated
- Warm and cool currents affect water temperature. This can also influence nutrients, prawn growth and reproduction.
- Currents carry prawn larvae and juveniles between areas, connecting nurseries with offshore spawning areas.

## Activity 3: An oceanographer's toolkit

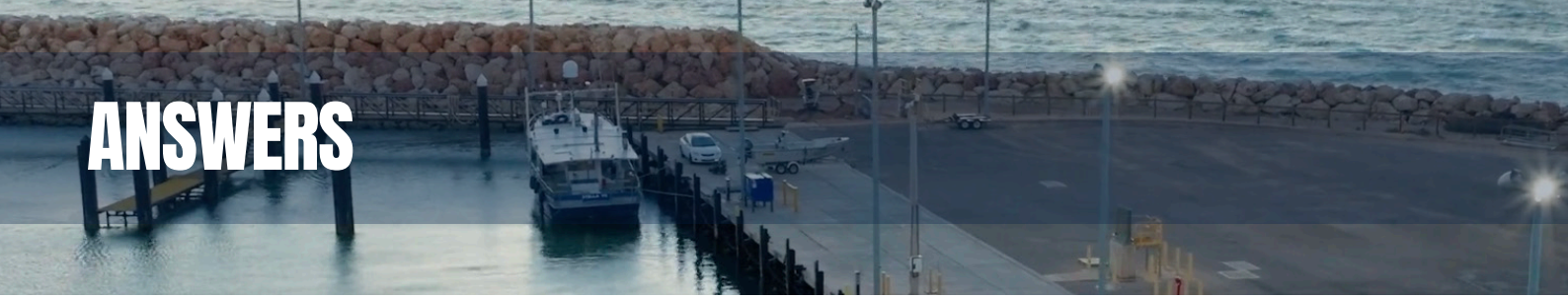
Drifter buoy - surface current speed and direction; GPS float - movement of water over time; Tide gauge - tide height; Satellite imagery - sea surface temperature, ocean colour, current patterns; ADCP - current speed and direction; Local vessel observations - Ocean colour, water movements in real time.

**How might currents or tides affect a prawn fishery?**

Currents and tides can influence where prawn larvae, juveniles, and their food sources move. This can affect prawn distributions and catch rates.

**Which tool would be most useful for understanding how prawn larvae move through Exmouth Gulf? Explain.**

A GPS float or drifting buoy would be useful for understanding how prawn larvae drift with currents through Exmouth Gulf - pathways, speed, and direction over time. A tide gauge would also be useful for showing how tidal changes may influence water movement in and out of the Gulf.



# ANSWERS

## Activity 5: Prawn Fishing in the Gulf

**Why might juvenile prawns need protected nursery areas?**

- Nursery areas support the future population of prawns
- Juvenile prawns need time to grow before they reproduce.
- Nursery habitats such as seagrass and shallow inshore areas can provide food and shelter.
- If too many juveniles are caught, fewer prawns survive to adulthood.
- Protecting juveniles helps maintain future catches and sustainable yield.

**Why might adult prawns be managed differently from juveniles?**

- Adult prawns may be targeted by the fishery, but fishers must still be careful not to overfish
- Adult prawns are still need to breed and produce the next generation of prawns

Insight: Juveniles need protection so they can grow; adults need management so they can reproduce.

**Why are seagrass, sponge gardens and coral communities important even if they are not the target species?**

- They provide habitat for prawns and other marine organisms.
- They support biodiversity.
- They may act as nursery or shelter areas.
- They may be food for marine organisms (e.g. turtles eat sea grasses)

**What could happen to a fishery if nursery habitats are damaged?**

- Fewer juvenile prawns may survive.
- Future adult prawn populations may decline.
- Food webs may be disrupted.
- Fisher catch rates may fall in future seasons.