Mapping ecosystem services.

Name: Class: Date:

Use these pages to build your concept maps on paper, alongside the lesson or in place of the maps on screen. Work in pencil, so that you can move concepts and links as your map grows.

YOUR FOCUS QUESTION

What did Shark Bay lose when its seagrass died?

SCREEN 1 How to build a concept map

1. Seagrass meadows goes at the top of the map. Most of the other concepts link back to it.
2. On each screen, add the concepts listed for it on page 2. Place each one near the concepts it links to.
3. Join two concepts with an arrow, and write a linking phrase on the arrow. Read the link along the arrow: it should make a true sentence.
4. Write each service in the column for its kind at the bottom of the sheet: provisioning, regulating or supporting. Benefits that fit none of these go under cultural.
5. Look for cross-links, which join two separate parts of the map, and draw them in.
6. Change your map whenever you learn something new.

SCREEN 1 Links that read as sentences

Each link reads as a sentence when you read it along the arrow. Novak and Cañas (2008) call these sentences propositions.



Seagrass meadows are food for dugongs and green turtles.

Read each link along its arrow, and tick the links that make a true sentence.

FROM	LINKING PHRASE	TO	TRUE?
Seagrass meadows	*trap*	**Sediment**	☐
Photosynthesis	*adds oxygen to*	**Air cycling**	☐
Dugongs and green turtles	*are food for*	**Seagrass meadows**	☐
Decomposers	*return*	**Nitrogen and phosphorus**	☐

One of the links reads the wrong way round. Write it the right way round.

SCREENS 1 TO 9

My Shark Bay map

Add these concepts screen by screen. Seagrass meadows is already on the sheet.

1. Dugongs and green turtles
2. Sunlight, Photosynthesis, Air cycling
3. Sediment, Clear water, Calmer shores
4. Faure Sill, Salty Hamelin Pool, Stromatolites
5. Carbon dioxide, Carbon sequestration, Carbon buried in the mud, Climate control
6. Nitrogen and phosphorus, Decomposers, Nutrient cycling
7. Habitat, Young prawns and fish, Food
8. Sea Country, Tourism, Science and World Heritage
9. Marine heatwave

Write your own linking phrases, and check that each link reads as a true sentence. If you need more room, copy your map onto a sheet of A3.

Concepts that aren't services go in this part of the sheet.

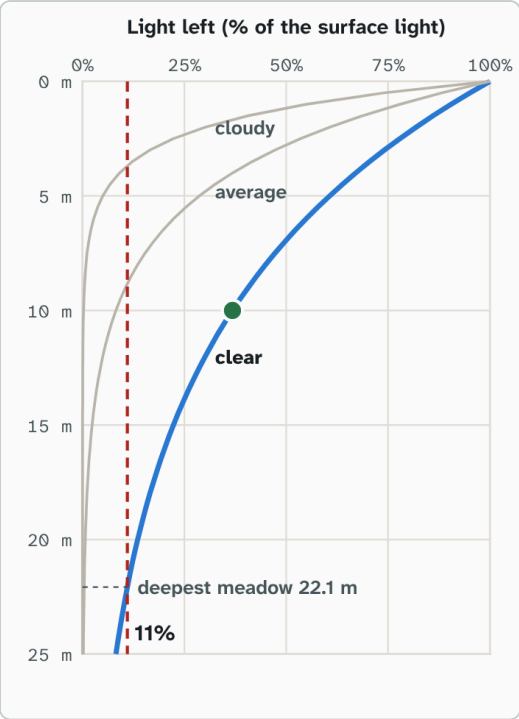
Seagrass meadows

P Provisioning	R Regulating	S Supporting	C Cultural, not in the syllabus list

SCREENS 2 AND 7

Reading the models

These charts come from the models on screens 2 and 7.

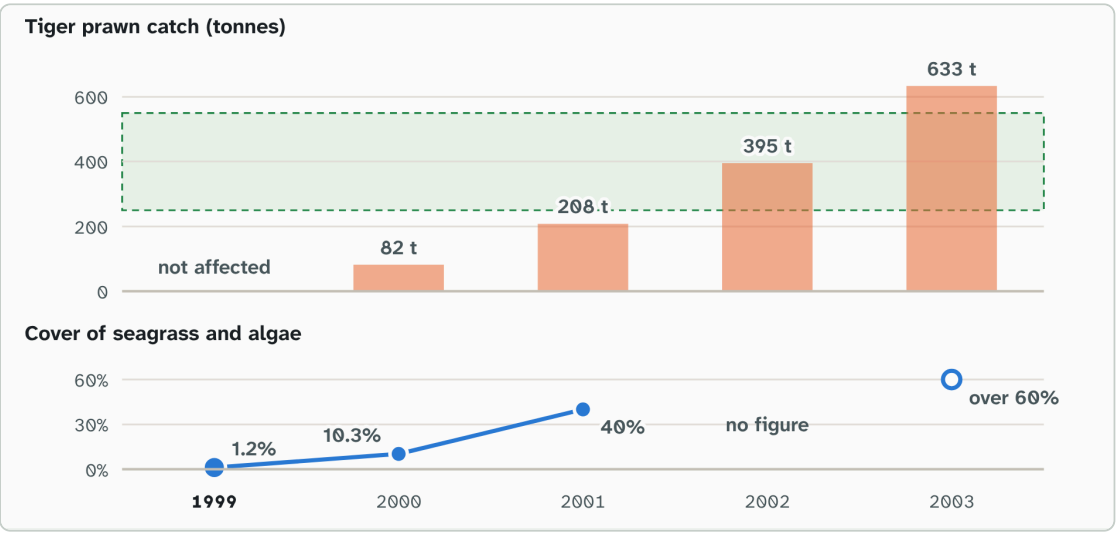


Light left at each depth in clear, average and cloudy water, from the light model on screen 2. The label shows the deepest meadow in clear water. The dashed red line is the 11% of the surface light that seagrass needs.

Read the curve for average water. What percentage of the surface light is left at 6 m, and how deep can a meadow grow in average water?

At 6 m: _____ %

Deepest meadow: _____ m



Exmouth Gulf's tiger prawn catch after Cyclone Vance in March 1999 (bars), the usual range of 250 to 550 tonnes (shaded band) and the cover of seagrass and algae (dots), from screen 7.

In which years was the catch below the usual range, inside it and above it? How did the cover of seagrass and algae change over the same years?

Below: _____ Inside: _____ Above: _____

SCREENS 9 AND 10

Checking my maps

Check both maps against this list. Then swap with a partner and check each other's maps.

CHECK	SHARK BAY MAP	JARRAH FOREST MAP
Every link has a linking phrase, and reads as a true sentence along its arrow.	☐	☐
Every service is in the column for its kind.	☐	☐
Every concept is linked to at least one other concept.	☐	☐
There is at least one cross-link between two separate parts of the map.	☐	☐
The map helps to answer its focus question.	☐	☐
I can explain every link, with evidence from the lesson.	☐	☐

SCREEN 9

My answer to the focus question

What did Shark Bay lose when its seagrass died? Answer in a paragraph, using your map. Name at least one service of each kind, and give the evidence for each loss.

What does your map leave out, or get wrong? Name one link you would change after seeing the evidence.

SCREEN 10

My jarrah forest map

Build a second map for the jarrah forest on the Darling Range, east of Perth. Try not to look back at your Shark Bay map.

YOUR FOCUS QUESTION

What would Perth lose if the jarrah forest were damaged?

Jarrah forest is already on the sheet. Add these concepts, link them and write each service in its column:

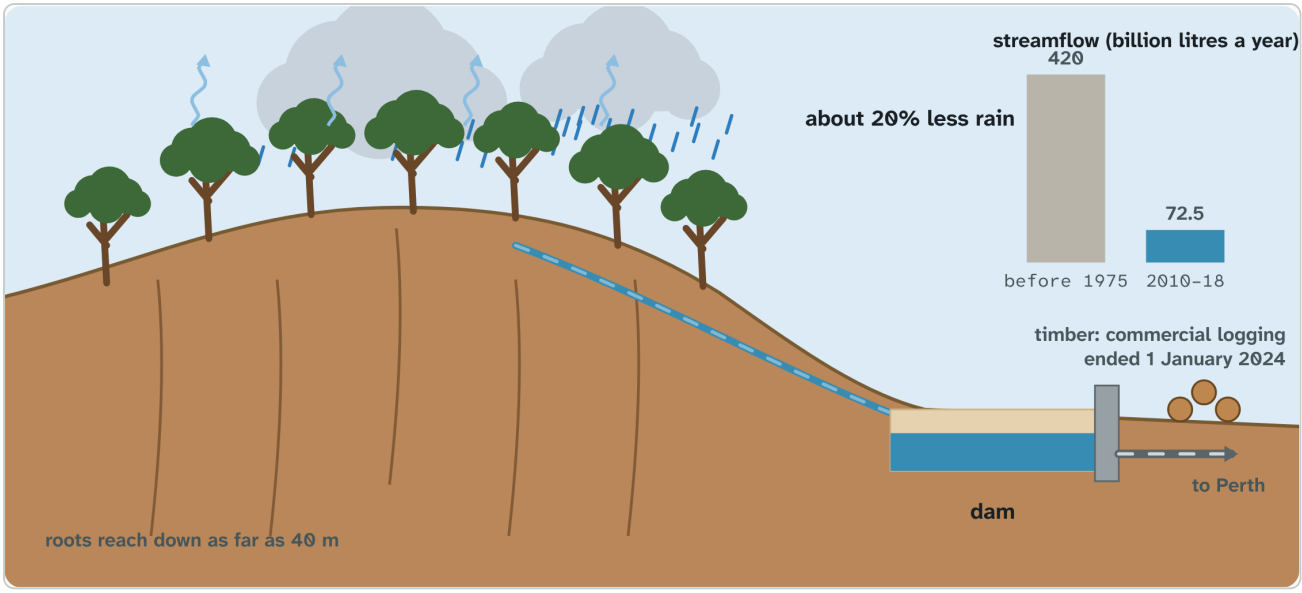
Rain, Perth's dams, Leaf litter, Water for Perth, Timber, Carbon sequestration, Climate control, Water cycling, Nutrient cycling, Habitat, Recreation

Concepts that aren't services go in this part of the sheet.

Jarrah forest

P Provisioning	R Regulating	S Supporting	C Cultural, not in the syllabus list

SCREEN 10 The jarrah forest catchment



The jarrah forest catchment model on screen 10, set to 2010 to 2018. The bars show the streamflow into Perth's dams before 1975 and from 2010 to 2018 (Water Corporation).

The rain fell by about 20%, but the streamflow fell by about 80%. Use the diagram to explain why a small fall in rain gave such a big fall in streamflow.

SCREEN 10 Looking back

Compare your two maps. Which kinds of service do both ecosystems give, and which services does only one of them give?

Which service was hardest to sort, and why? Which link on your Shark Bay map surprised you most?