

Dugongs and their Seagrass habitats



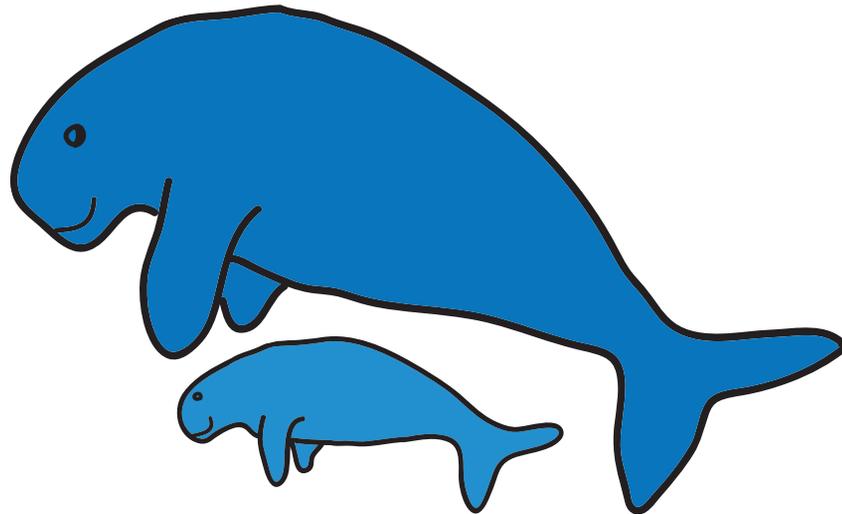
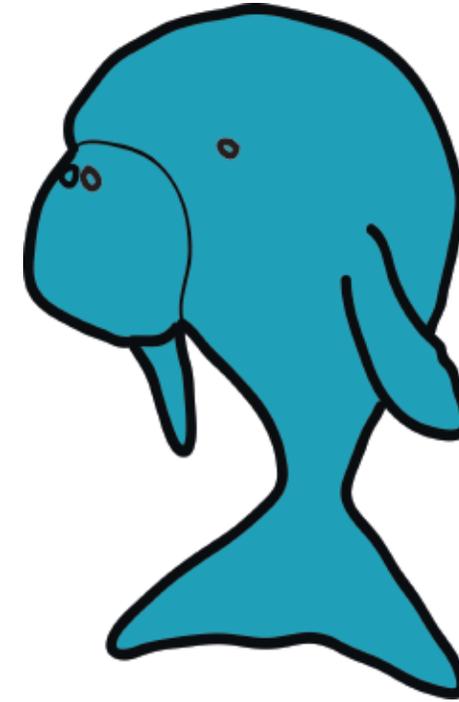
By Christina Shaw

Dugongs

Dugongs, also known as Sea Cows are large charismatic marine mammals that live in tropical coastal areas. They are found along the coasts of many countries around the Indian and Pacific Oceans from East Africa to Vanuatu.

They are large animals and can grow up to 3 metres in length and weigh up to 500kg

Dugongs are herbivores, which means they only eat plants. Their main diet is seagrass and they eat a lot of it. They can eat up to 40kg of seagrass every day.



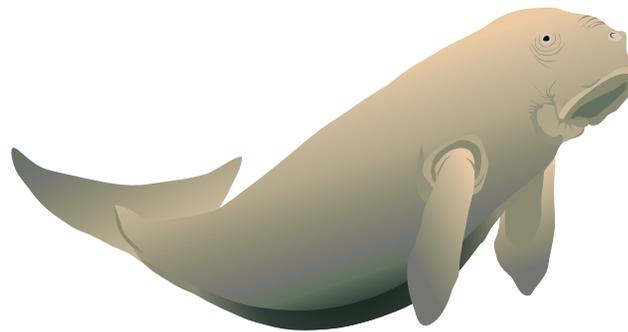
Mammals are warm-blooded animals with backbones. They are different from other classes of animals because their babies are born alive and suckle milk from their mothers. They have lungs and breathe air. Their skin is usually covered by hair or fur, but cetaceans (whales, dolphins and porpoises) and dugongs have a generally smooth skin and the insulation that would be provided by fur in most mammals is instead provided by a thick layer of fatty tissue under the skin, called blubber.

The Dugongs' Cousins

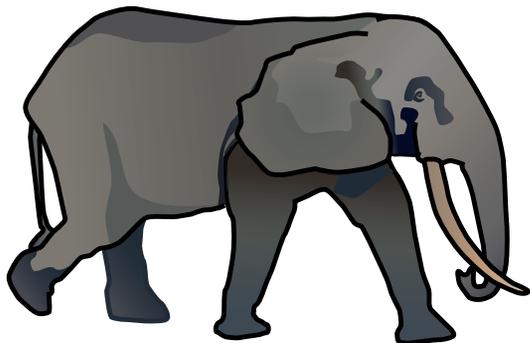
The dugong's closest relative is the manatee. There are four species of manatee and they live in the Americas and Africa. They all belong to the order of Sirenia, which means mermaid. There was another, much bigger, closely-related species called the Steller Sea Cow but it is now extinct. In the eighteenth century humans (mostly whalers) took just 27 years to hunt this species until every last one was gone.



Manatees have paddle shaped tails. Their mouths point forwards so they can eat the vegetation from the banks of rivers.



Dugongs have a fluked tail like a whale. They have flat mouths that are turned down to make it easier to eat seagrass from the bottom of the sea.



Did you know the dugong's closest relative on land is an elephant?

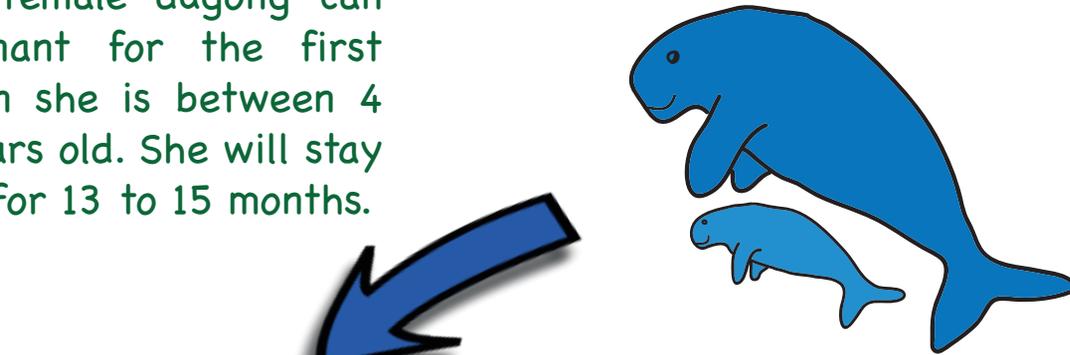
The Mermaid myth



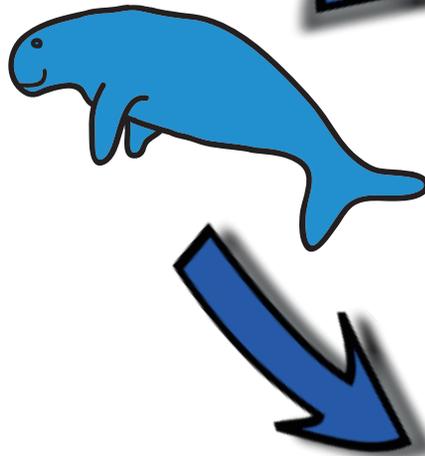
People think that the myth of the mermaid might have come from sailors seeing dugongs and manatees at sea. Mermaids are mythical creatures, half human and with the tail of a fish. They are supposed to be beautiful with long flowing hair. Do you think dugongs are as beautiful as mermaids?

The Life Cycle of a Dugong

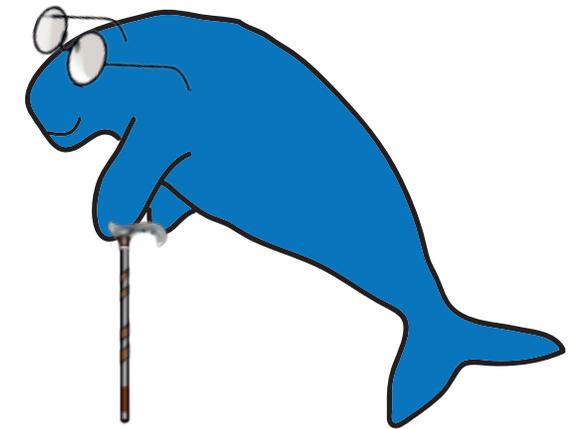
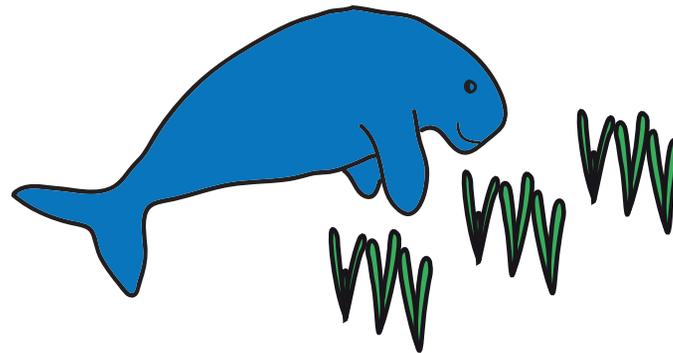
A young female dugong can get pregnant for the first time when she is between 4 and 17 years old. She will stay pregnant for 13 to 15 months.



When a dugong is born it stays with its mother and drinks her milk for about 18 months.



Dugongs will have calves about every 2 to 5 years. It depends on how much food the dugongs have to eat. If there is not as much seagrass available the time between calves will be longer.



The life cycle of a dugong is very long. Dugongs can live until they are seventy years old.

It takes a **long time** for them to grow up and reproduce. They are pregnant for a **long time** and they suckle their calves for a **long time**. This means that if adult dugongs are lost from the population it takes a **long time** for the population to recover. This is why it is important to ensure adult female dugongs are not accidentally or deliberately killed.

There are benefits of having dugongs in our waters

Dugongs are a sign of healthy seagrass beds. Dugongs cannot survive without seagrass beds so if there is a healthy population of dugongs that are breeding regularly it indicates there must be plenty of seagrass for them to eat.



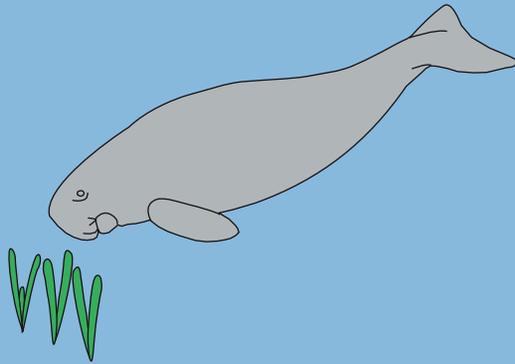
Tourists like to see dugongs in the wild so a healthy population is an asset for the tourism industry. Seeing a dugong on a dive can be the highlight of somebody's holiday.

We like to see them - it can make us feel wonder at the natural world to have an encounter with a large charismatic animal, like these surfers from Pango village. Photo by Feanzer Kalpep.



Threats to Dugongs

Dugongs are listed on the International Union for Conservation of Nature (IUCN) Red List of Threatened Species as 'Vulnerable'. This means that they are at risk of becoming extinct. The number of dugongs has gone down in most places where they live.

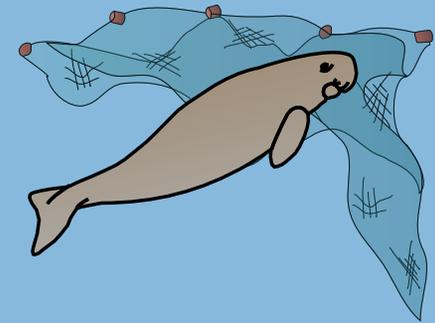


Dugongs depend on seagrass for food. Seagrass beds are declining all around the world. If dugongs don't have enough to eat they will not survive.

In some countries dugongs are traditionally hunted. If too many dugongs are taken this is a threat to the survival of this unique species. If dugongs are disturbed by human activity in and around their feeding sites this can also affect their survival.



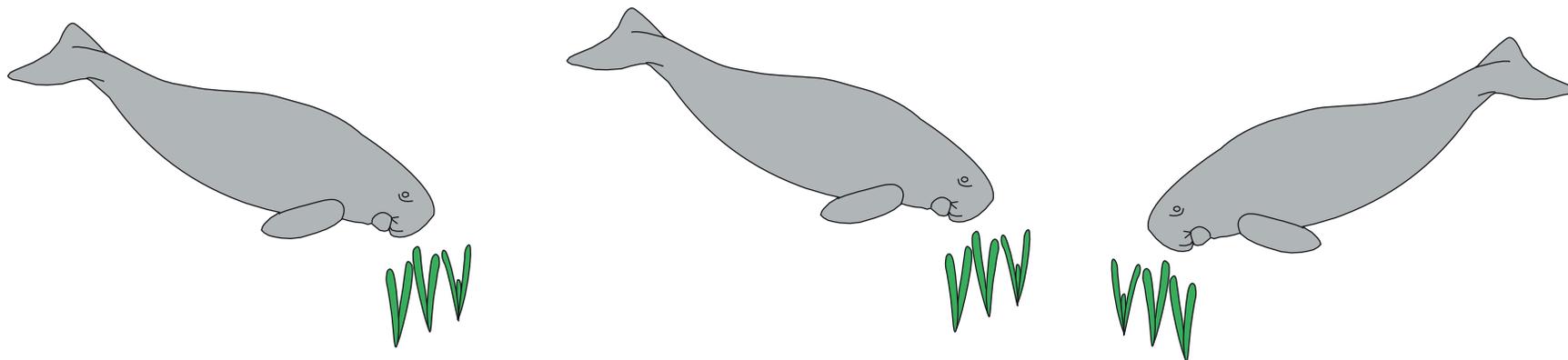
Dugongs can get killed or injured when struck by a boat. They are either struck by the hull of the boat or more often cut by the propeller. This is known as boat strike.



Dugongs can get caught in fishing nets and drown. Currently the biggest threat to the survival of dugongs worldwide is getting caught in gillnets. This is known as by-catch. Dugongs can also get entangled in active or discarded ('ghost') nets or fishing gear such as fishing lines with hooks.

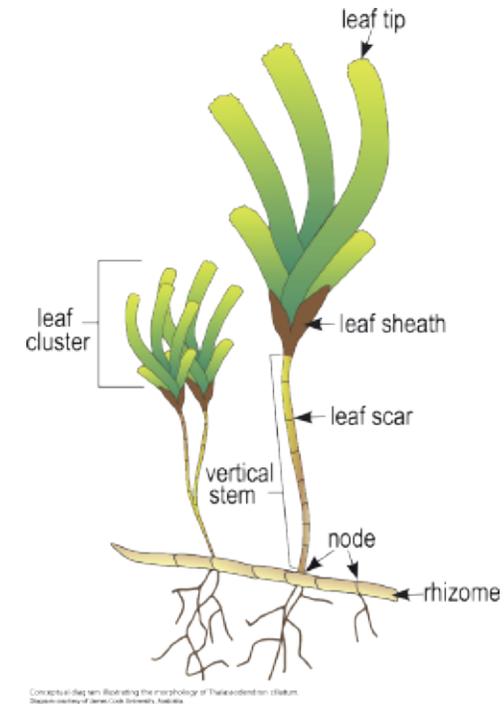
What we can do to help dugongs survive.

- Look after seagrass beds: protect existing healthy beds from development including jetties and anchorages.
- Take care when driving boats in areas where dugongs are known to occur. This will reduce the chance of a collision and minimise the likelihood of disturbing them when they are feeding. If people, including tourists, want to see dugongs, the dugongs should be approached slowly and quietly and not chased.
- Stop or reduce hunting of dugongs. Killing of dugongs is against the law in many countries, including Vanuatu. Ensuring that the law is adhered to will help dugongs survive.
- Don't leave fishing nets or other fishing gear unattended especially overnight.
- If a dugong is found in a net, release it immediately.
- Be careful not to lose fishing gear in the sea which will add to the ghost net problem.



Seagrasses

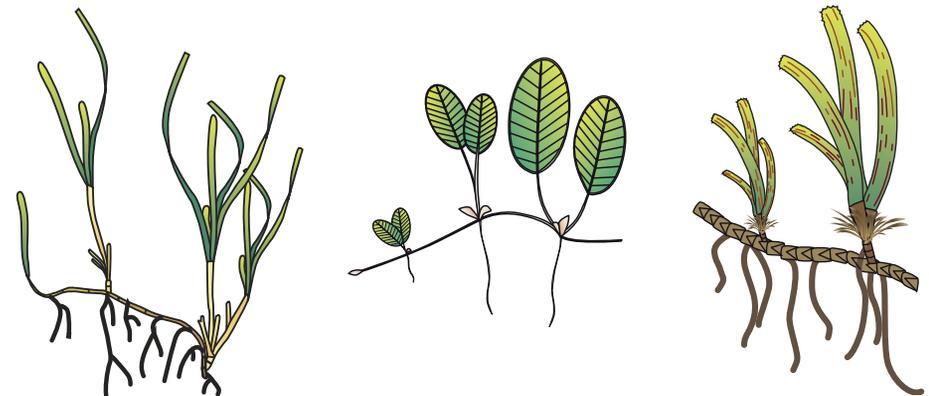
Seagrasses are flowering plants that have adapted to live in the sea near the coast. You can find seagrasses in the inter-tidal zone (the area of coastline which becomes exposed when the tide goes out) or in the sub-tidal zone (the area below the tideline which is always submerged).



Seagrasses have a true root system and they produce flowers, fruits and seeds. Their leaves are sensitive to light and they produce energy by photosynthesis just like plants on land.

Seagrasses are sensitive to changes in:

- Turbidity - how much sediment is in the water, which will affect the water cloudiness. This affects how much light can pass through the water.
- Depth - in deeper water less sunlight gets to the leaves.
- Temperature - if the water temperature gets too hot seagrasses can 'burn' similar to coral bleaching.
- Salinity - how salty the water is. Changes in the salinity can upset the water balance inside the plants.



Seagrass is different from seaweed

Seaweed

- A type of algae
- Do not produce flowers, fruits or seeds
- Do not have veins
- Do not have a true root system
- Either float or attach to rocks with a holdfast

Seagrass

- A type of flowering plant, which produces flowers, fruits and seeds
- Have veins in their leaves
- Have a true root system and can take up nutrients from seabed sediments
- A root system that holds the plant in the sand or mud

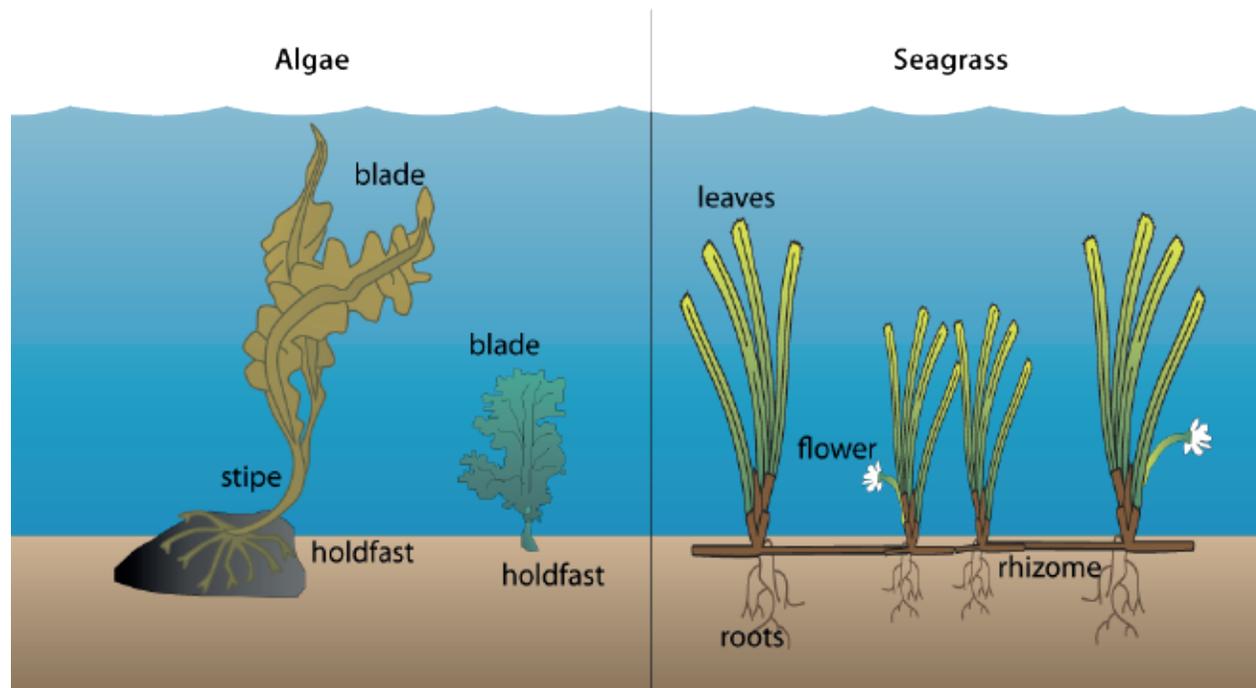


Diagram from "Tropical Connections: South Florida's marine environment" (pg. 250) - <http://ian.umces.edu/press/publications/374/>

Seagrass beds provide habitat for many different species of animals.

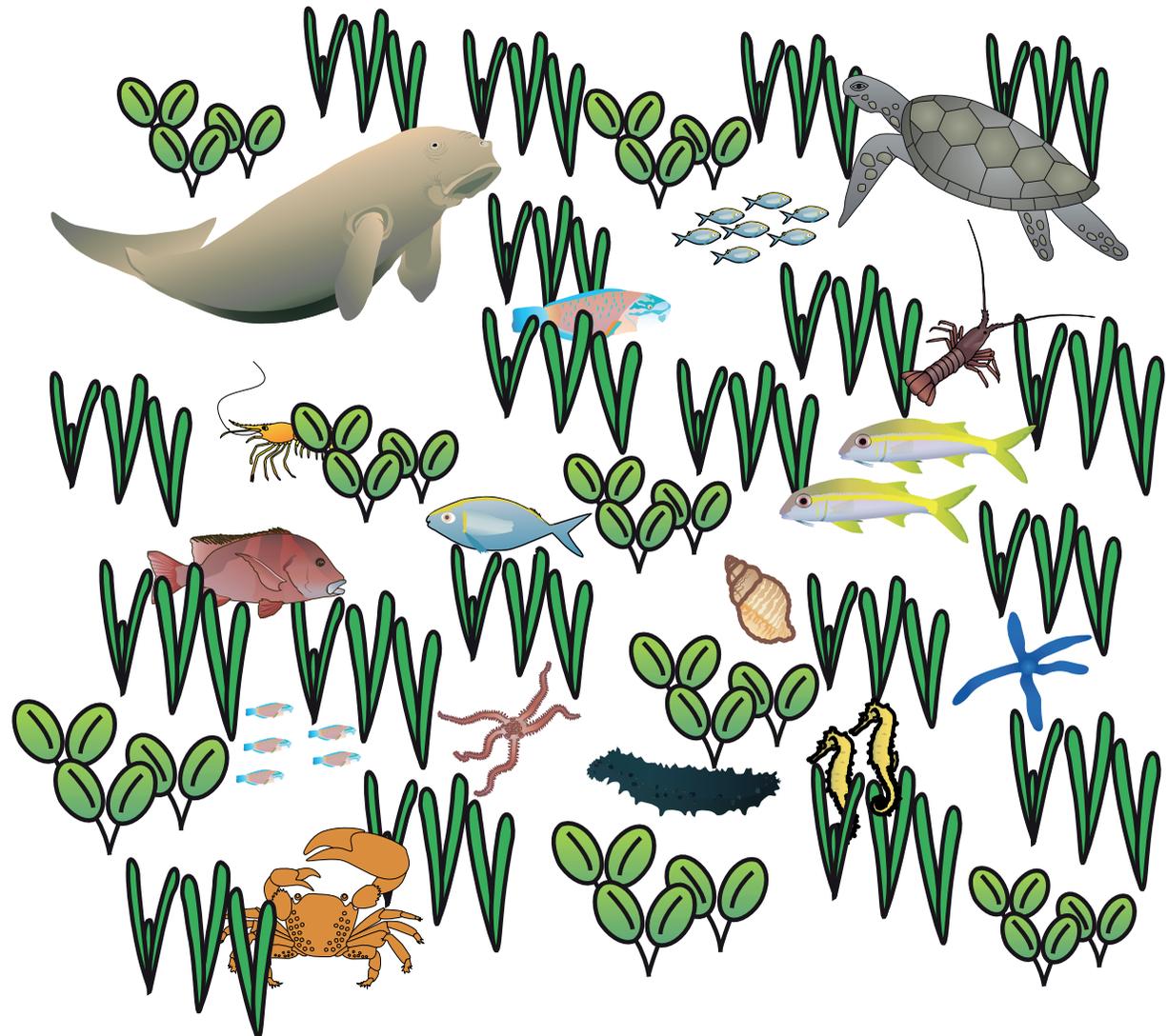
Many different species of fish can be found in seagrass beds including rabbitfish, goatfish, parrotfish and emperors.

Seagrass beds are nurseries for species of juvenile fish that live on the reef as adults.

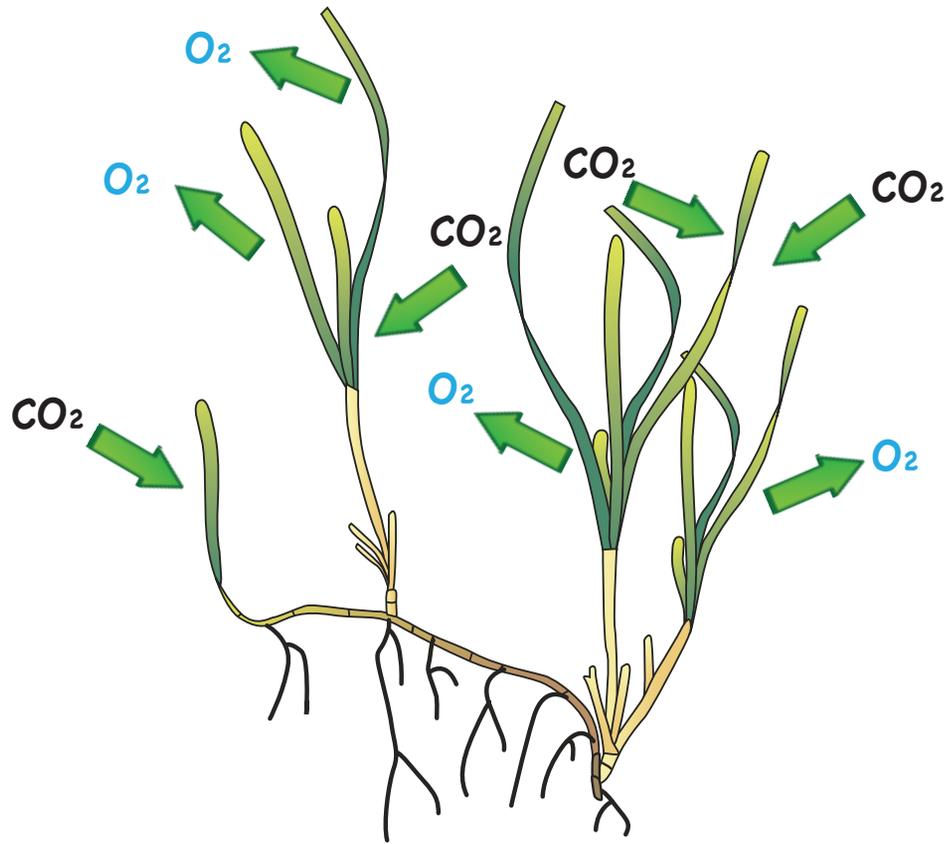
Shellfish make their home in seagrass beds.

Seagrass is habitat for sea cucumbers, seahorses and sea stars.

Dugongs and green sea turtles depend on seagrass beds for food.



Seagrass beds help keep the environment (and us) healthy



Human activities are causing increases in greenhouse gases, including carbon dioxide (CO₂), in the atmosphere. This is leading to changes in the climate. The weather is becoming more unpredictable with more powerful storms. Much of the CO₂ released into the atmosphere is absorbed by the oceans. As carbon dioxide dissolves into seawater, the oceans are becoming more acidic.

Seagrasses capture carbon. They absorb CO₂ and release Oxygen (O₂). This helps to counter the effects of climate change and reduces ocean acidification. An area of healthy seagrass can hold 10-15 times more carbon than the same area of Amazonian rainforest.

It is estimated that 10% of the annual carbon sink capacity of the oceans is due to seagrass.

Seagrasses work together with mangroves and coral reefs

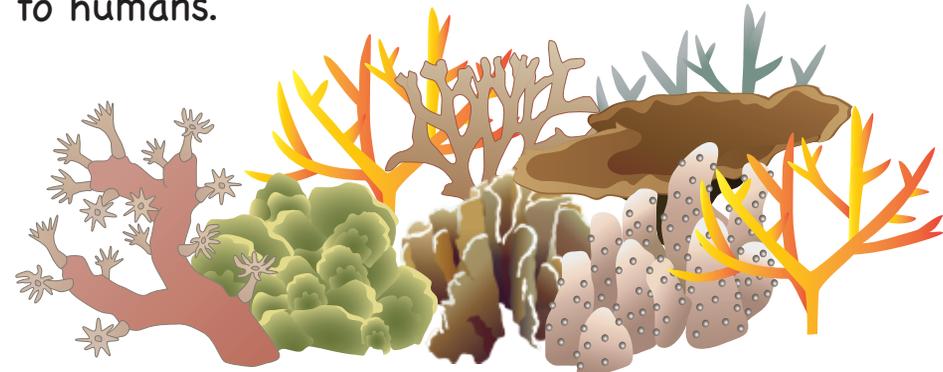
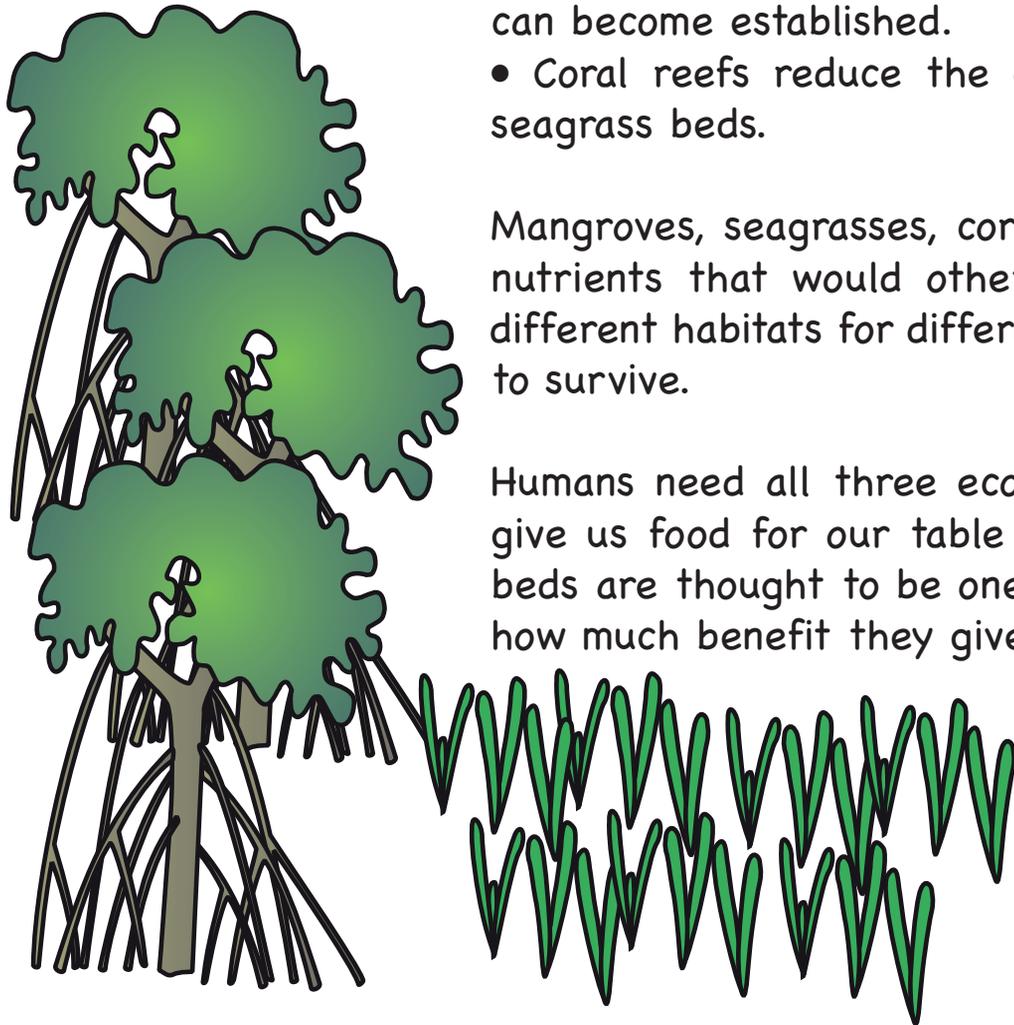
Coral reefs, mangroves and seagrass beds all stabilise the coastline and protect it against erosion, storm surges, tsunamis and cyclones.

All 3 of these ecosystems need the others to stay healthy and survive.

- Mangroves filter out the sediment and excess nutrient in run-off from the land and reduces the impacts of run-off which can damage and smother the seagrass and coral.
- Seagrasses stabilise the sediment and reduce the current and surge so mangroves can become established.
- Coral reefs reduce the energy of the waves and protect the mangroves and seagrass beds.

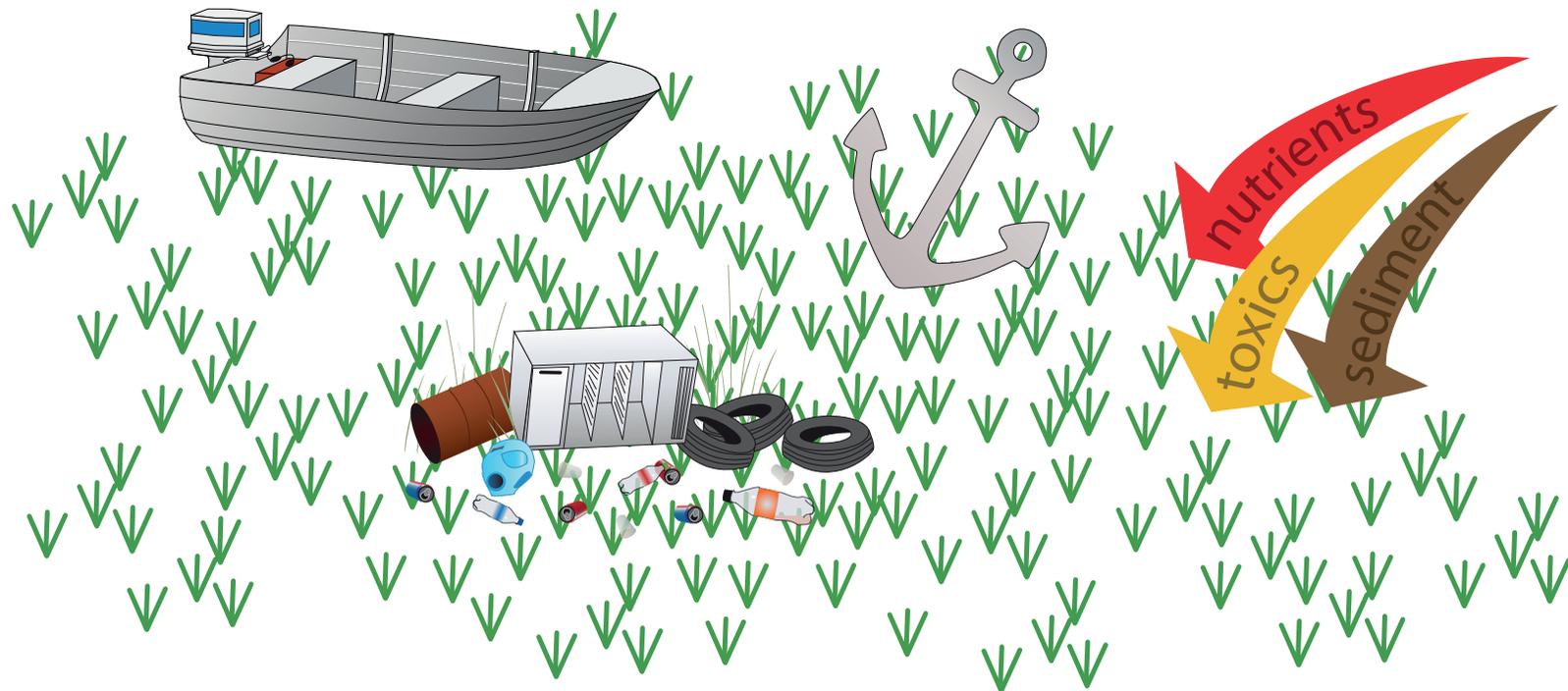
Mangroves, seagrasses, coral reefs and all the creatures that inhabit them cycle nutrients that would otherwise be lost into the deep ocean. Many species use different habitats for different stages of their life cycle and need all three habitats to survive.

Humans need all three ecosystems to stay healthy and to protect our coastlines, give us food for our table and to reduce the impact of climate change. Seagrass beds are thought to be one of the most valuable habitats in the world in terms of how much benefit they give to humans.



Seagrasses are under threat

It is estimated that over half the world's remaining seagrass beds are declining and a third have already disappeared.



- Seagrasses need sunlight to survive. Increases in turbidity will reduce the light getting to the seagrass. Trawling and increased run-off from the land increase turbidity and are bad for seagrasses.
- Dredging, land reclamation, coastal clearing can remove seagrass beds.
- Seagrass beds can be damaged by boat propellers and anchors.
- Sewage, litter and other waste products can harm seagrass beds.
- Aquaculture can cause increase in nutrient levels and turbidity.
- Extreme weather events e.g. cyclones and flooding can physically damage the seagrass beds and change the salinity and turbidity, which can be detrimental to the seagrass.

We can help keep seagrass beds healthy by:

- Reducing sediment run-off from land into the sea e.g. by not removing vegetation along river banks
- Not trawling or dredging near seagrass beds
- Looking after the mangroves and coral reefs
- Taking care when driving boats over seagrass beds
- Not anchoring in seagrass beds
- Keeping beaches and the sea free from litter
- Making sure sewage and other waste products do not get into the sea
- Monitoring seagrass beds to ensure they are staying healthy and resilient



Here comes the fun part... Games and Activities

Now you have read all about dugongs and seagrass see if you can complete the activities on the following pages. If you are not sure of the answers just look back and find them in the first part of this book. Everyone can join in. Have fun!

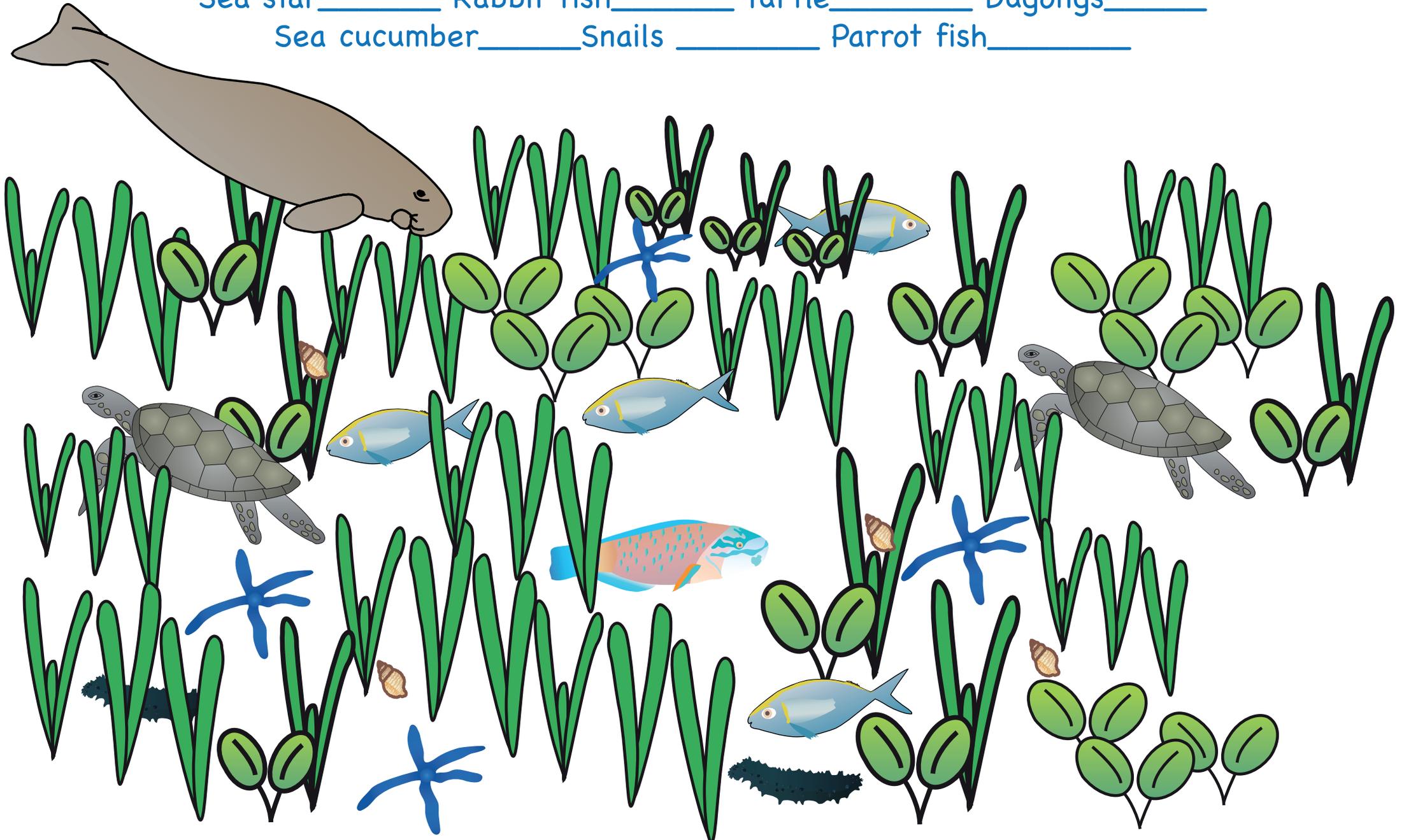


Hiding in the Seagrass

How many of each of the following animals can you find living in this seagrass bed?

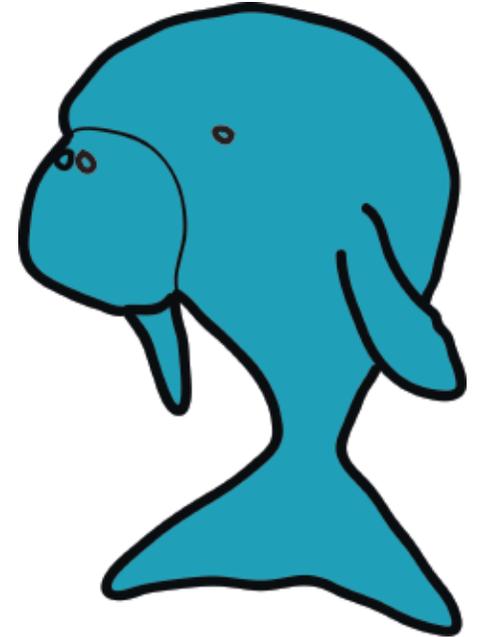
Sea star _____ Rabbit fish _____ Turtle _____ Dugongs _____

Sea cucumber _____ Snails _____ Parrot fish _____



Dugong Quiz

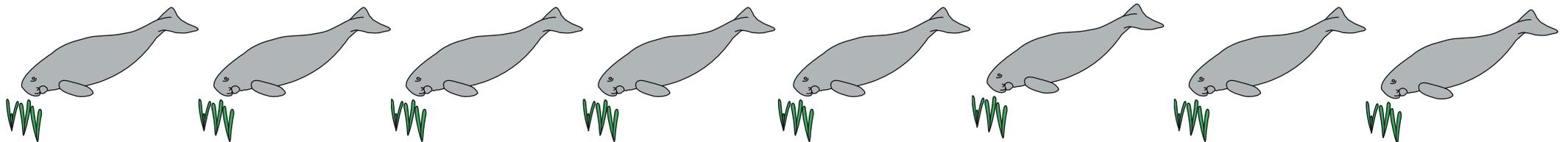
Now you have read the first part of this book, you should be able to answer all these questions. If you can't remember the answer to any question you can go back and look for it! (Answers are at the back of the book.)



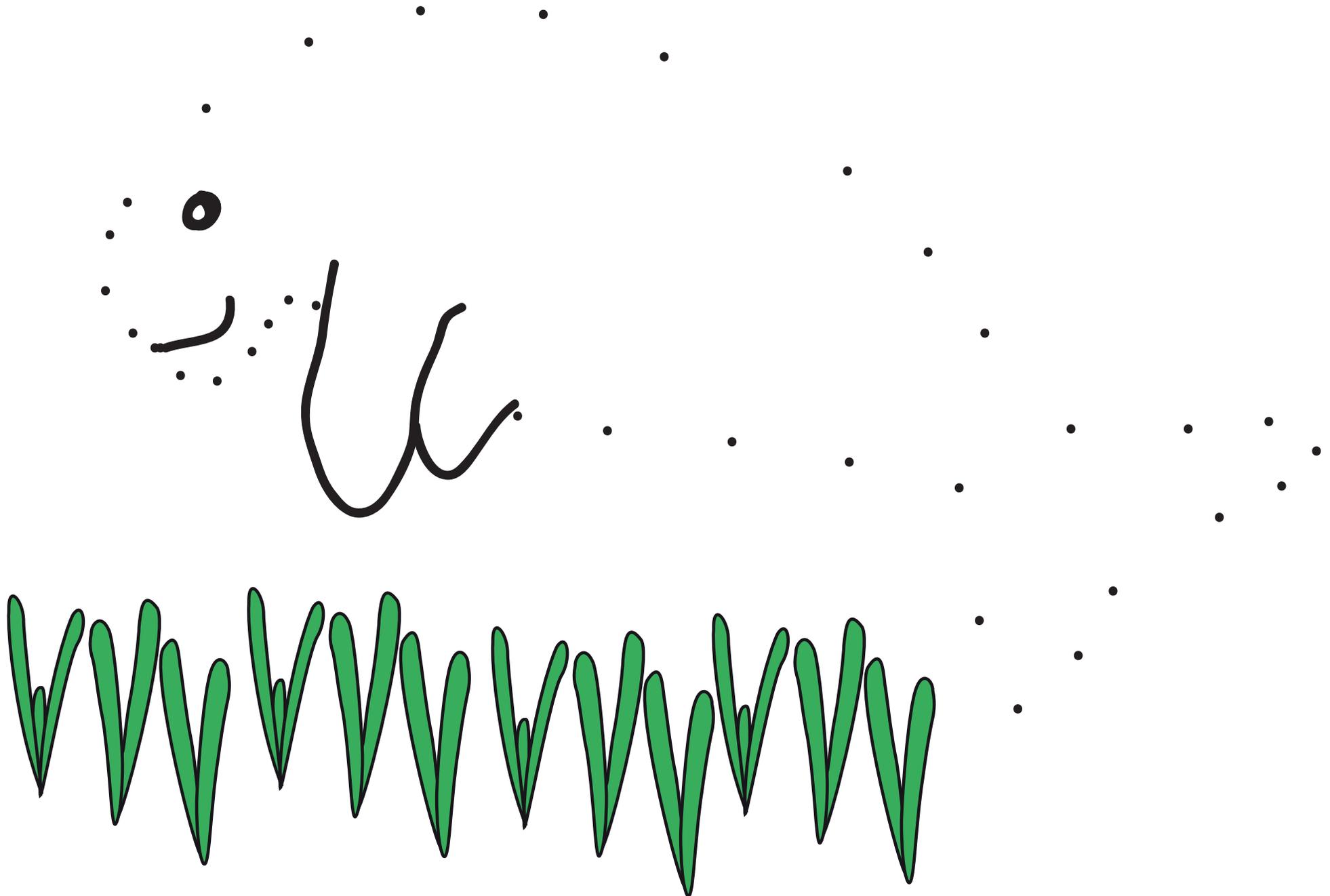
1. How many kilograms of seagrass can a dugong eat every day?
2. True or false: Dugongs live in many countries surrounding the Indian and Pacific Oceans.
3. How old is a female dugong when she has her first calf?
4. How big can a dugong be (in weight and length)?
5. True or false: Dugongs are marine mammals, they breathe air and the babies drink milk from their mothers.
6. How long does a baby dugong stay with its mother?
7. True or false: If the seagrass beds dies, it won't matter to dugongs because they can find something else to eat.
8. Which of the following are threats to dugongs:
a) boat strike, b) by-catch in fishing nets, c) forest fires d) invasive species
9. What is the closest relative to the dugong?
a) cattle, b) pigs c) elephants, d) dogs
10. How long can a dugong live?

How did you do?

/10

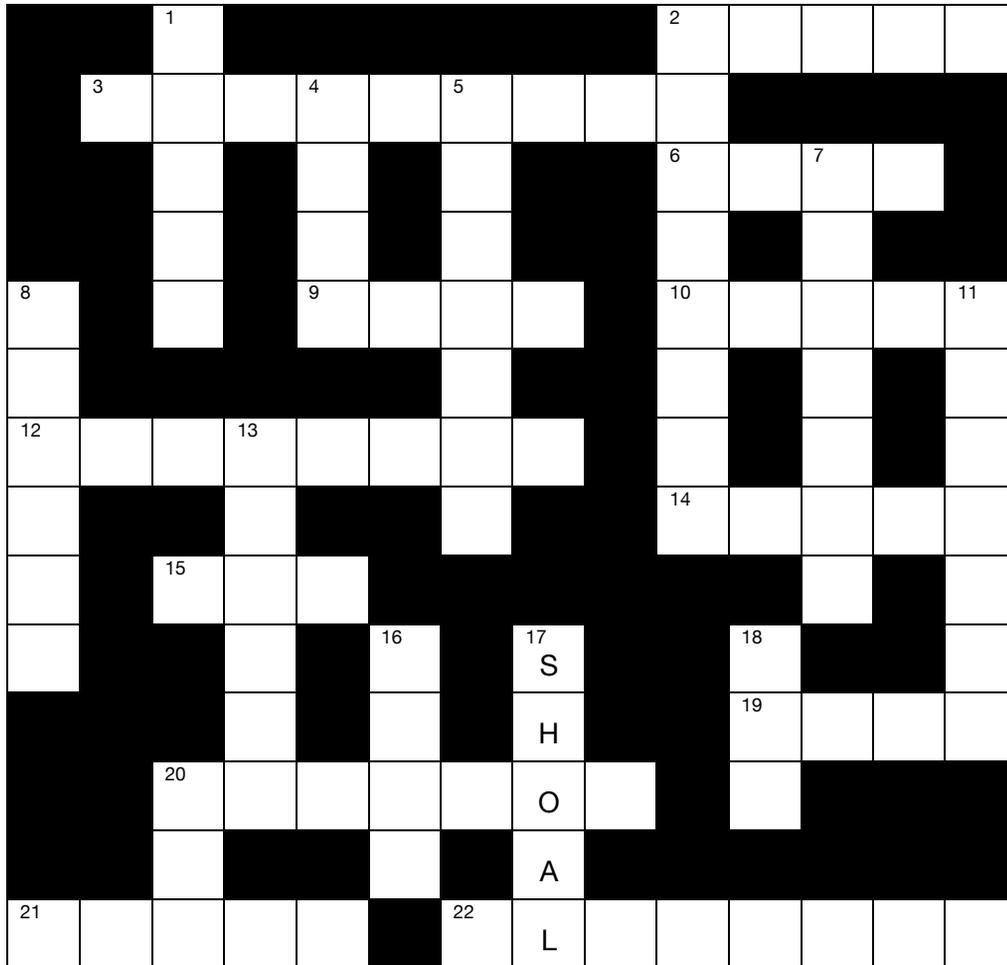


Join the dots to see who lives near the seagrass



Dugong and Seagrass crossword

Place the answers to the questions in the grid. We have given you a head start with Q 17 Down. Top tip: if you don't know the answer you can find most of them in the first part of this book.

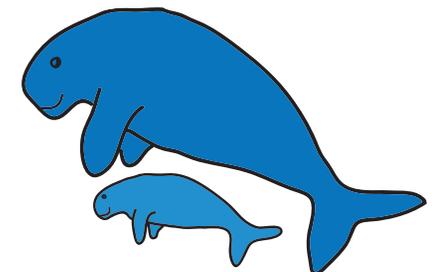
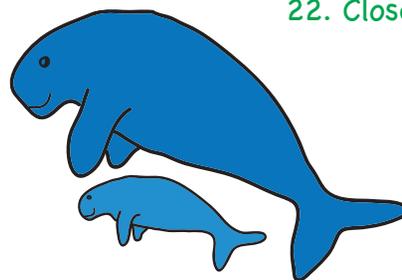
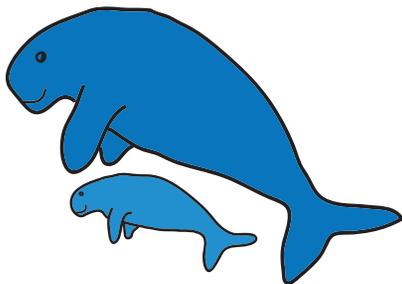


Down

1. Seagrasses have roots, flowers, fruits and _____
2. Dugongs eat _____
4. A dugong can get injured when struck by a what?
5. The country that marks the most easterly edge of the dugong range
7. Seagrasses help to prevent coastal _____
8. Another name for a sea cow
11. How many years can a dugong live?
13. Dugongs can grow up to 3 meters in _____
16. Opposite to female
17. Another name for a group or school of fish
18. The Stellar Sea Cow became extinct a long time _____
20. _____weed is different to sea grass

Across

2. Dugongs live close to the _____
3. Animals that only eat plants
6. It is important to look after your _____ of seagrass
9. Tourists can see dugongs when they go on a _____
10. A difference between seagrasses and seaweed
12. The most significant threat to dugongs globally is getting caught in _____
14. A small rock
15. How many calves does a dugong normally have?
19. What colour is a dugong?
20. Dugongs live in _____water
21. Seagrass is a flowering _____
22. Close relative to dugongs

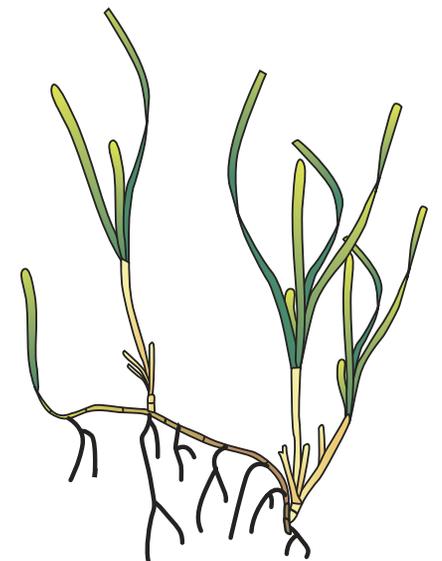
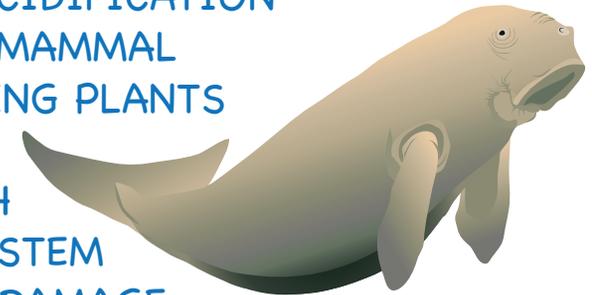


Dugong and Seagrass word search

Can you find these words in the grid?
They may be forwards, backwards, up, down or diagonal.

O	P	E	L	T	R	U	T	N	E	E	R	G	V	B	Y	D	U
S	C	L	I	M	A	T	E	C	H	A	N	G	E	F	T	J	A
Y	S	E	A	G	R	A	S	S	B	E	D	C	K	L	F	L	N
W	E	B	A	Y	C	G	P	T	Q	A	X	Y	U	O	Q	A	C
M	A	R	I	N	E	M	A	M	M	A	L	I	Y	W	F	C	H
M	H	E	U	D	A	I	T	C	E	T	O	R	P	E	S	I	O
F	O	A	G	F	C	C	M	G	U	I	Q	V	R	R	T	P	R
I	R	T	W	O	O	G	I	L	L	N	E	T	X	I	H	O	D
S	S	H	U	A	R	E	L	D	U	G	O	N	G	N	R	R	A
H	E	E	S	P	A	T	K	A	I	T	F	H	Y	G	L	T	M
N	A	T	G	R	L	P	A	C	I	F	I	C	Z	P	K	U	A
U	U	E	C	T	B	J	S	Y	W	U	I	R	Q	L	A	P	G
R	R	O	O	T	S	Y	S	T	E	M	T	C	X	A	R	Y	E
S	I	W	X	R	R	K	C	C	H	K	U	J	A	N	C	H	M
E	S	E	V	O	R	G	N	A	M	R	C	Z	F	T	N	H	E
R	O	C	O	M	M	U	N	I	T	Y	E	Y	U	S	I	Q	V
Y	P	L	X	A	Z	M	E	A	V	C	T	A	W	E	Z	O	O
R	Y	E	A	E	T	A	T	I	B	A	H	C	T	I	X	G	N

- DUGONG
- SEAGRASS BED
- OCEAN ACIDIFICATION
- MARINE MAMMAL
- FLOWERING PLANTS
- PACIFIC
- BY CATCH
- ROOT SYSTEM
- ANCHOR DAMAGE
- FISH NURSERY
- GILL NET
- COMMUNITY
- CLIMATE CHANGE
- COAST
- THREAT
- TROPICAL
- MILK
- BREATHE
- GREEN TURTLE
- SEA HORSE
- HABITAT
- PROTECT
- MANGROVES
- CORAL

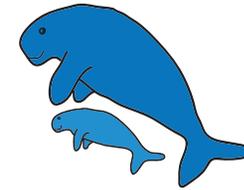


Activities

1) Make up a song about dugongs and their seagrass habitat. You could sing about how seagrasses, dugongs and humans are all part of one ecosystem that we need to protect to keep us all healthy, or chose your own subject.



2) Write a story about the life of a dugong from when it was born to when it is an old dugong. Include all the important life cycle facts in your story.



3). Create a new dance about seagrass and the ecosystem services they provide to people.



4) Write a play about dugong conservation. Include at least 2 threats and 2 ways to help conserve dugongs and/or seagrass beds.



5) Have a debate. You could chose from these topics or make up one of your own:

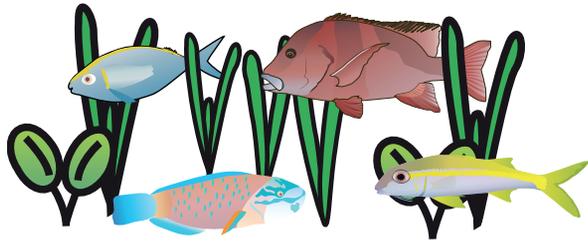
Seagrass, mangroves and coral all help protect our coastline. Which is more important?

Dugongs are affected by climate change but it is not the biggest threat to their survival. Discuss.



Seagrass Habitat Check List

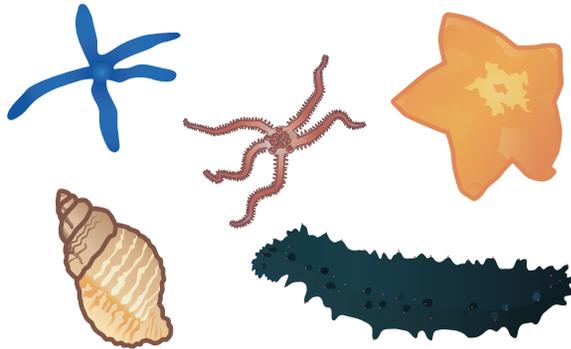
Seagrass beds are home to many species of animals and plants. For this activity you need to go out to the seagrass beds near you and see what you can find?



Fish

Seagrass beds are home to adult fish. How many different types can you see?

Seagrass beds are also nurseries for juvenile fish. How many kinds can you count?

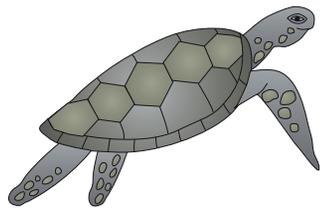


Invertebrates

Sea Stars live in seagrass beds. How many different coloured ones can you find?

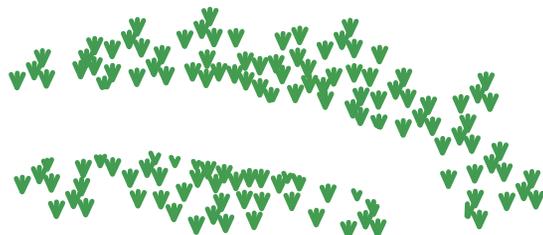
Sea Cucumbers also live in the seagrass and eat and filter the sediments. How many different kinds can you find?

Shellfish, like snails and conches, live there too. How many can you count?



Turtles

Green turtles feed on seagrass. Look for turtles popping their heads out of the water when they come up to breathe. Did you see any?

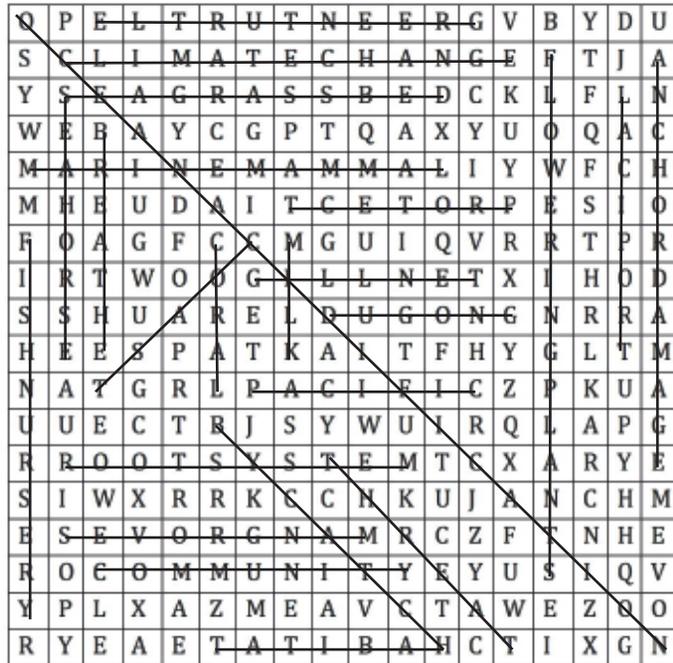


Dugongs

Dugongs leave tracks in the seagrass beds where they have been feeding. Did you find any?

Answers

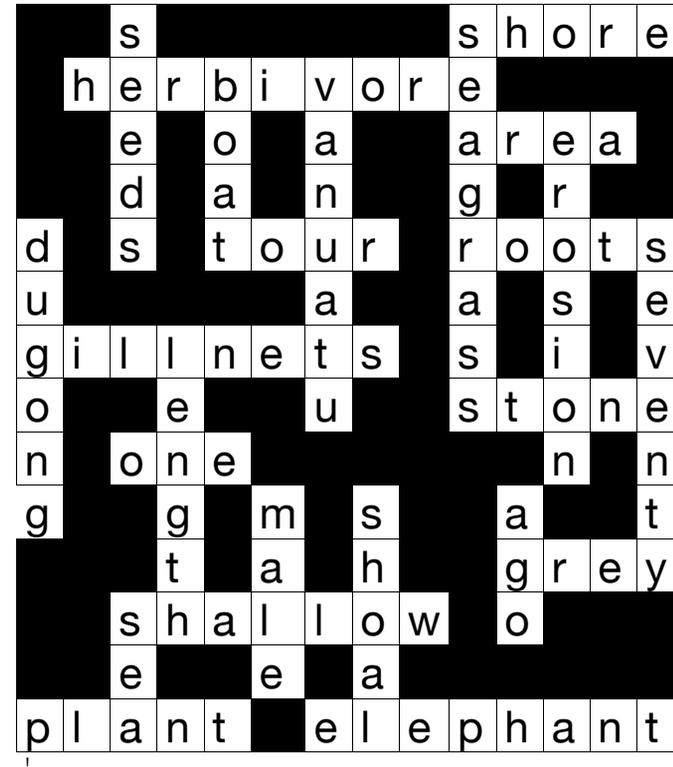
Dugong and Seagrass word search



Dugong Quiz

1: 40 kilograms 2: True 3: 4 to 17 years 4: 500 kilograms and 3 meters 5: True 6: About 18 months 7: False - Dugongs rely on seagrass for survival 8: a and b 9: c 10: Seventy years

Crossword



Hiding in the Seagrass

Sea star 4; Rabbit fish 4; Turtle 2; Dugongs 1; Sea cucumber 2; Snails 4; Parrot fish 2.

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