



# FADING STRIPES

The Bull Rays' Struggle Against Extinction





# ACKNOWLEDGEMENTS

**Authors:**

Sophie Babbs  
Thais Amaral  
Charlie Matthews

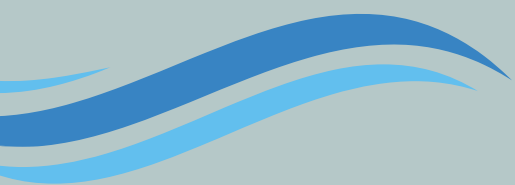
**Illustrations:**

Elin Meek

Supported by:  
Malta Environment Foundation



2024





©Sophie Babbs



©Sophie Babbs



---

**1** About Sharklab-Malta  
PAGE 1

---



**2** Introduction to Bull Rays  
PAGE 2

---



**3** How to Identify  
PAGE 4

---



**4** Bull Rays in Malta  
PAGE 5

---



**5** The Importance of Bull Rays  
PAGE 6

---



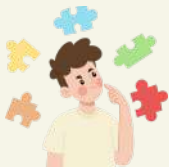
**6** Bull Rays Threats  
PAGE 7

---



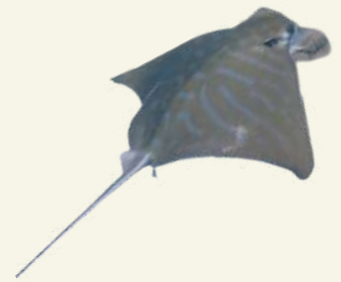
**7** Be a Part of the Solution  
PAGE 9

---



**8** Games and Activities  
PAGE 13

---



# CONTENTS



# SHARKLAB



Who we are and what we do

**Sharklab-Malta is a non-governmental organisation (NGO) that works on a voluntary basis. Its mission is dedicated to research, education, and raising awareness of elasmobranchs (sharks, rays, skates, and chimaeras) around the Maltese islands. All of this contributes to their overall conservation.**

In terms of education and awareness, Sharklab-Malta works with schools to educate the younger generations about the biology and conservation of these animals. We also conduct presentations and talks at the Malta National Aquarium and other events across Malta to reach a wider audience.

Sharklab-Malta has several ongoing research and conservation projects, such as the **"Oviparous Species Eggcase Recovery and Release"** and **"Fly With Bull Rays"** projects.



# BULL RAYS

## BULL RAYS ARE A STRIPED SPECIES OF EAGLE RAY FOUND HERE IN MALTA

Bull rays (*Aetomylaeus bovinus*) are a rare, understudied and critically endangered species of Eagle ray (Myliobatidae), found around the Mediterranean and West Coast of Africa.

Despite living in shallow waters, very little is known about their behavioural patterns and life-history, such as population size and possible migratory patterns. This shallow habitat leaves them at increased risk of a wide variety of human led impacts across their range. This includes fishing with direct impact from commercial and recreational sources, which can cause habitat damage and loss.



©Fly With Bull Rays



©Fly With Bull Rays

I love to travel! Sometimes I swim over 1100 km around the coast of South Africa!

## DID YOU KNOW?

- What do they eat?

Bull rays eat small crustaceans and invertebrates such as crabs, shrimp, and molluscs.

- Why do they have blue stripes?

It is thought bull rays have blue stripes to aid in camouflage, blending in with the ripples on the sea floor.

- How do they reproduce?

They reproduce through eggs developing inside the female's body, hatching. and the young are born live, this is called ovoviviparity.



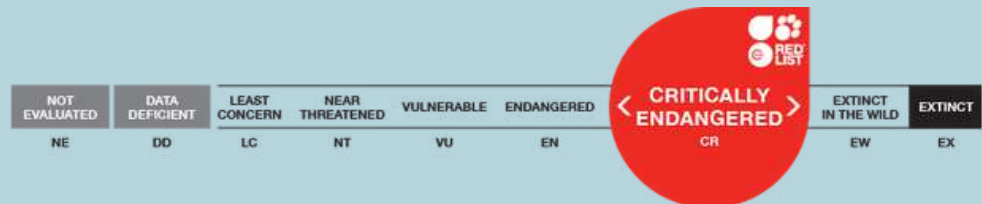
# BULL RAYS

## A LITTLE MORE INFORMATION ABOUT ME!

- Size - up to 2.5 m wingspan
- Depth - 0 to 60 m
- Distribution - Mediterranean Sea and West to South Africa
- Lifespan - mature between 4-6 years; unknown maximum lifespan
- Reproduction - Ovoviviparous
- Small litter size (3-6 pups) with a long gestational period
- Diet - mollusks and crustaceans
- Confirmed migratory route off South Africa, but unknown Mediterranean migratory patterns



©National Geographic



## FUN FACTS

There are 19 species of Eagle rays in the world and 2 of these are in Malta: the Bull ray and the Common eagle ray (*Myliobatis aquila*).

They are called Bull rays because due to their long, flat and round snouts. However, in South Africa they are called "Duckbill eagle rays".

They have a completely cartilaginous skeleton, meaning they have no bones in their entire body allowing for them to be lightweight and flexible.

Bull rays have been found to migrate across over 1100 km in distance!



©Fly With Bull Rays



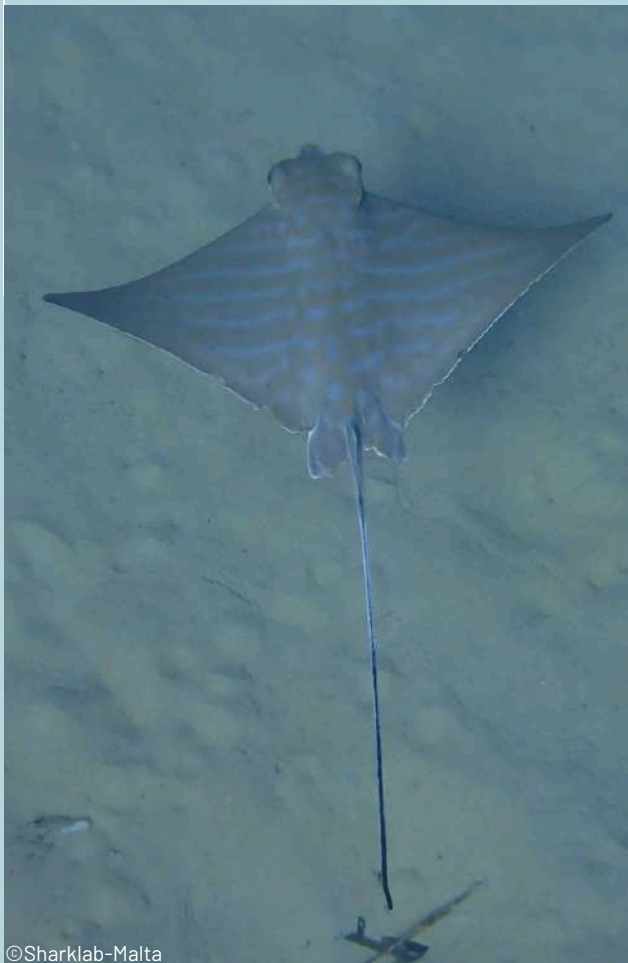
# HOW TO ID

## SPOTTING THE DISTINCTIVE FEATURES OF BULL RAYS

Bull rays are easy to identify when you look for these key features:

- An elongated, diamond-shaped body
- Unique blue stripes across their backs
- A long, pointed snout
- A tail that is twice the length of the body
- A small dorsal fin located at the base of the tail
- A serrated spine on the tail
- Their fins flap like a bird's wings

All of these characteristics can be clearly seen in the images below!



**Each Bull ray has a unique stripe pattern, like a fingerprint. This allows us to identify individual rays and track how many have been observed visiting or re-visiting.**

# BULL RAYS IN MALTA

## NURSERY AREA

Our current data shows that Malta is probably one of the nursery areas for Bull rays. This is due to the fact that the wingspan of the individuals being seen around the islands is 30-60 cm wide, and pups are known to be born between 22-45 cm. We also see very few large individuals, so for now it is still a mystery where these juveniles go once they become adults.

This nursery area is vital for the survival of the species. Its presence also indicates good ocean health with an abundance of resources to support the pups and a lack of larger predators to eat them.



## LOCAL NAMES

In Maltese, these amazing creatures have a range of names including:

- *Ħamiema rasha twila*
- *Għasfur*

The variety of common names and lack of local knowledge about the species makes it incredibly hard to work out what people mean when these are spoken about or written. Many of these names also have a multitude of meanings.

## SPEARFISHERMAN

Unfortunately, their predator in Malta is us, humans! Specifically in Malta, they are fished and hunted for sport as they are a large moving target and easy to shoot.

However, in fact the meat of many species of rays and sharks is actually toxic for us humans as they accumulate heavy metals such as mercury!

**They need our help!**

Bonġu! My name is Josephine and I am a baby Bull ray. Sharklab thinks that I was born here in Malta!



# The IMPORTANCE of Bull rays

Sharks and rays are one of the most widespread and diverse groups of species in the animal kingdom and feed on a wide variety of prey, so their ecological roles can be very diverse.

Bull rays specifically are a bottom dwelling predator. As bottom feeders, Bull rays can disturb the substrate while foraging, which helps to aerate the sea floor and promotes the growth of Posidonia and other marine vegetation.

Bull rays help maintain the balance of marine populations by preying on smaller fish and invertebrates. This helps control their populations and promotes biodiversity.

**Unfortunately, despite their importance, Bull rays are highly threatened locally and globally. The biological characteristics of these species (late sexual maturity, long gestation periods and small numbers of offspring) make them highly vulnerable to threats. This means that, in a few decades, they may go extinct, leaving this planet forever.**

Additionally, by consuming various organisms, Bull rays contribute to nutrient recycling within the marine ecosystem, returning essential nutrients to the environment through their waste.

They are an indicator species meaning, their presence is an indicator of the overall health of marine ecosystems, making them important for ecological monitoring.

The importance of sharks and rays as key species and regulators of ecosystems is well established in ecological theory and is supported by countless examples. Some species are even fundamental to the structure of marine communities.



©Sophie Babbs

## Bull ray population

# THREATS

### OVERFISHING

Overfishing occurs when fish are removed from a population faster than they can replace themselves through reproduction.

The capture and consumption of sharks and rays has existed for hundreds of years. However, since the end of the Second World War, the increase in fishing effort and the expansion of fishing areas, coupled with the growth of the world's population, has increased the demand for sharks and rays. Since then, catches of these animals have increased.

The market for shark and ray products is very diverse and is based on their fins, meat and liver, and with less commercial value, their skin, skeleton and even teeth and jaws. Shark liver oil and squalene are

extracted from the livers of these animals and used in:

- Cosmetics industry (moisturising creams),
- Food supplements,
- Pharmaceuticals (vaccines)
- Animal feed

### In Malta

In the Mediterranean, statistics show that 73% of fish stocks are overfished. This has a significant impact on the shark species in Malta as their source of food is removed.

However, sharks in Malta are caught as bycatch, which means that fishers catch them unintentionally. Keeping them to sell in the market. If they run out of storage room on the boat and have a more valuable catch they will often throw sharks caught as bycatch overboard.

In the market sharks are sometimes sold under the title of boneless fish. Customers assume this is swordfish, However, often it is shark.

Mazzola is a popular dish which can be found all throughout Malta. Unknown to a large percentage of the Maltese population "Mazzola" is a word describing seven species of small threatened sharks.

The consumption of shark fuels the market for it. The higher the demand for sharks in the market, the more that are caught. Many people would be opposed to knowingly eating threatened shark species, however, they might be unintentionally eating them in foods like "Mazzola", local fish, or white fish.





©Joseph



©John Cahil Rom



©Naja Bertolt Jensen



©Vishal Kamani



©Sensuvar Sahim



©Sophie Babbs

## FINNING

Finning is the process of cutting off the fins and throwing the rest of the animal's body into the sea.

Shark and ray fins are some of the most expensive seafood in the world, and the existence of a global market for shark-based products has led to a sharp decline in the species.

Countries in East and South-East Asia, such as China, Taiwan, Malaysia and Japan, are major consumers of shark fins. Hong Kong is a true global hub, importing between 50-70% of the world's fins. The practice of finning has been restricted by legislation. It not only generates enormous waste, but also goes against all principles of animal welfare, ethics, and threatens the survival of many species.

## HABITAT LOSS

Habitat loss refers to the reduction in the amount of space in which a particular species or group of species can survive and reproduce. Overfishing, pollution, increasing urbanisation in coastal areas, a growing global population and the spread of invasive species from our activities are threatening marine ecosystems and the services they provide around the world.

Coastal habitats such as mangroves, kelp forests and reef systems are important nursery and feeding grounds for many shark and ray species. They provide essential shelter for their young and support a variety of prey species. Shark and ray populations around the world are suffering from habitat loss.

## GLOBAL WARMING

Global warming refers to the long-term increase in the Earth's average temperature. Although this increase has been going on for some time, its rate has accelerated significantly in the last century due to the burning of fossil fuels. As the human population increases, so does the consumption of fossil fuels.

With global warming comes another problem - climate change. This phenomenon refers not only to changes in weather patterns and growing seasons around the world, but also to rising sea levels. This is caused by the expansion of warmer oceans and the melting of ice sheets and glaciers. These changes pose serious threats to shark populations in the form of increased vulnerability to fishing, disruption of predator-prey interactions, and changes in encounter rates with human water users.

## POLLUTION

Pollution is the introduction of harmful materials into the environment. This can affect sharks and rays in different ways.

Due to their wide distribution, and the fact that they occupy different positions in the food chain, these animals accumulate large amounts of heavy metals and other persistent organic pollutants, which can affect their survival. Other forms of pollution, such as lost fishing gear (or ghost fishing) can also affect these species. This fishing gear, deliberately discarded or lost at sea, continues to catch fish without the hope of being emptied resulting in an endless cycle of high mortality.

**ALL OF THESE THREATS CAN AFFECT SURVIVAL AND REPRODUCTION IN ELASMOBRANCHS - IF THIS TREND CONTINUES, MANY WILL BECOME EXTINCT.**

Bull ray

# PROTECTION MEASURES

Since 1970 Bull rays are estimated to have a population decline of over 80%! This had caused them to be classified as critically endangered on the IUCN Red List of Threatened Species. This means that they do not have long left until extinction!

They have been included in the protection protocols of the Barcelona Convention, covering the entire Mediterranean, and the Convention on Migratory Species, which applies globally. However, these protections must also be adopted locally by each country, and so far, they have not been translated into local Maltese law.

*From Fading Stripes...*

*to Rays of Hope*



**The future of these beautiful creatures is at a critical point, and it's up to us to act now. If we don't act together, they may not have one.**

Next steps

# BE THE SOLUTION

## Individual action

### AWARENESS

- Raise awareness of the importance of sharks and rays and the fact that they are not necessarily as dangerous as the media shows

### PLASTIC USAGE

- Reduce your use of plastic and avoid polluting the Earth and the ocean
- Help in beach and sea clean ups - even removing a few pieces of plastic when visiting beaches

### CONSUMPTION

- Check the label or ask the supplier to ensure that the species you are buying is not a shark or ray
- Avoid using products containing shark constituents (cosmetics, nutrition, accessories)
- Do not eat shark or ray products

### CITIZEN ACTIONS

- Participate in citizen mobilisation actions for the conservation of sharks and rays that promote behavioural changes in society, including online petitions

### FISHING PRACTICES

- Use G hooks instead of J hooks
- Pay attention to nets and mesh size

Next steps

# THE BIGGER PICTURE

## With Sharklab-Malta

### ✓ RESCUE EGGS

Help us rescue eggs from dead mothers, hatch them and then release the sharks

### ✓ RESEARCH

Help us do research about Bull rays, by sending any Bull ray or other elasmobranch sightings to our reports page

### ✓ ENCOURAGE POLICY MAKERS

Help us to encourage governments to take action to protect sharks and rays

## Government & Policy Makers

### ✓ PROTECTED AREAS

Create new protected areas in key shark and ray habitats such as breeding, nursery and feeding grounds

### ✓ PROTECTED SPECIES

Update local lists of protected species and include more species of elasmobranchs whose populations are known to have been declining in the Mediterranean and Maltese waters

### ✓ FISCALIZATION

Improve the electronic document to accurately record the fish catches and sales to prevent illegal, unreported, unregulated fishing practices.



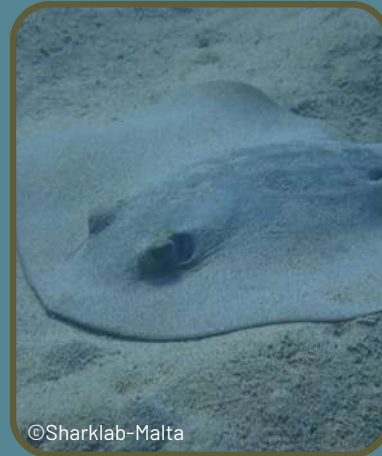




# WE NEED YOUR SIGHTINGS!

The numbers of sharks and rays are declining, we need information about their populations in order to protect them.

As citizen scientists you can be our extra eyes in the water.



**Send your elasmobranch sightings to us!**



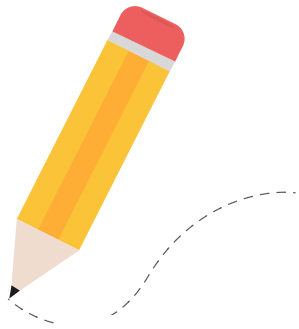
**Help Our Conservation Mission!**



# GAMES +ACTIVITIES

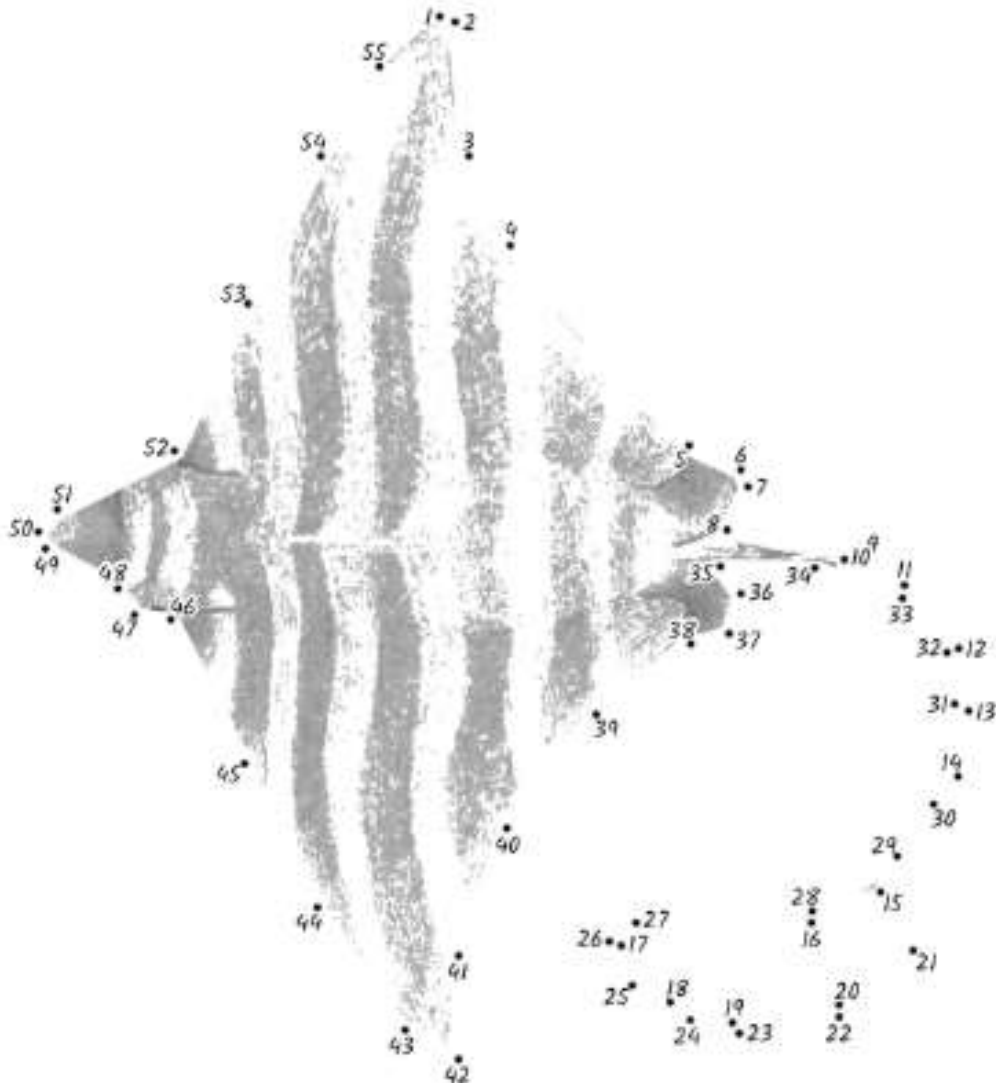


Do you remember the fun facts and information about Bull rays that you learnt in this booklet? These games will help you memorize them in a fun way!



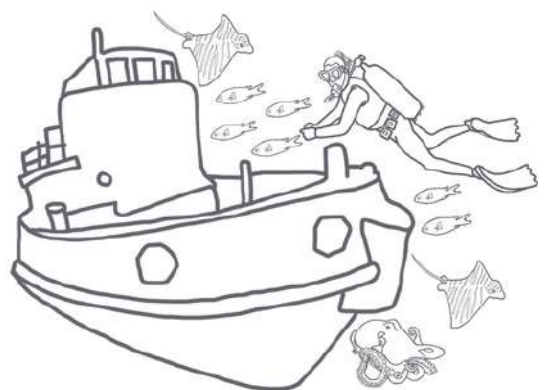
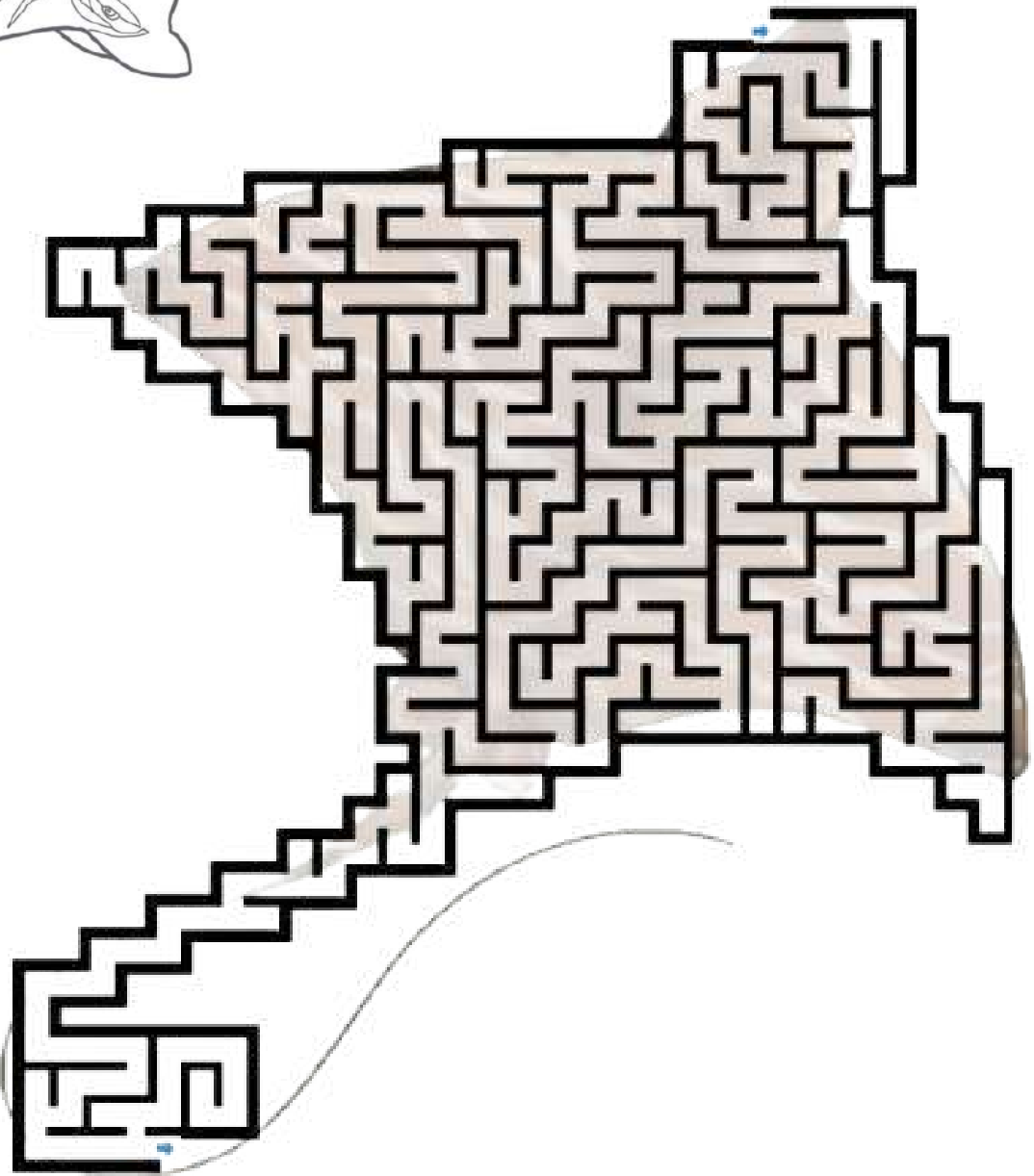
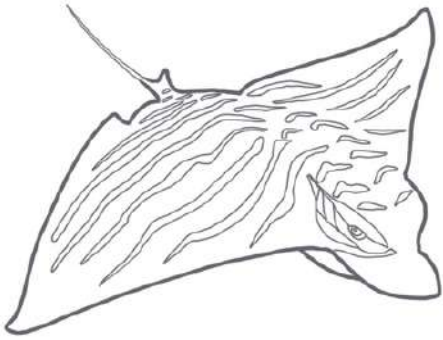
## JOIN THE DOTS

Join the dots to find the Bull ray hiding!



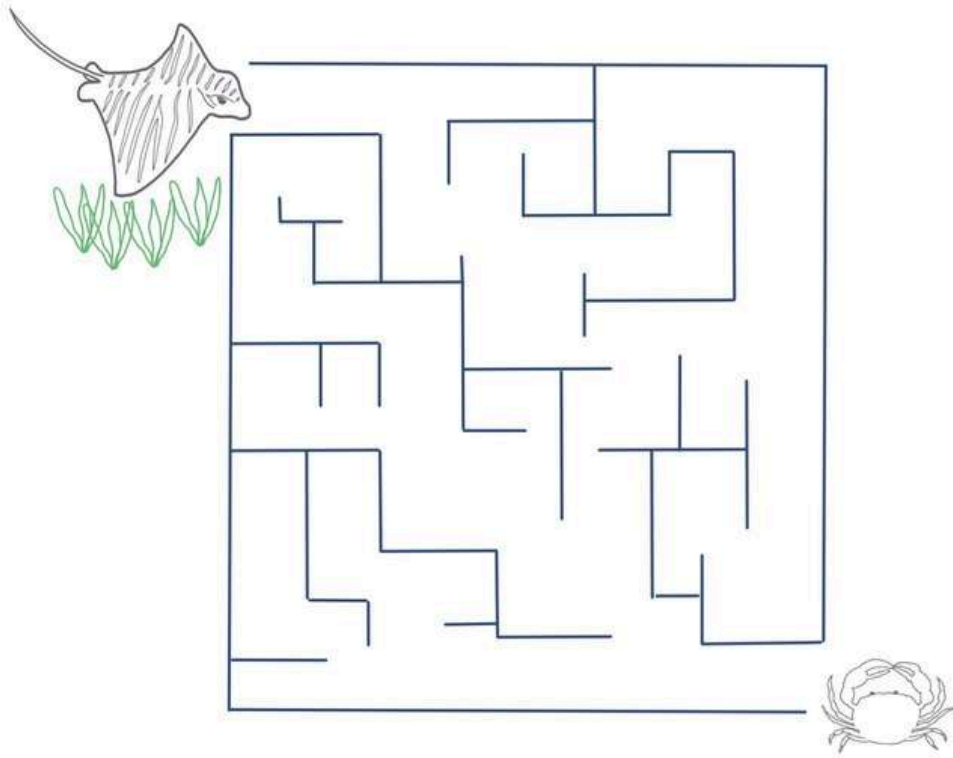
# MYSTERY BULL RAY

Can you find the way out?



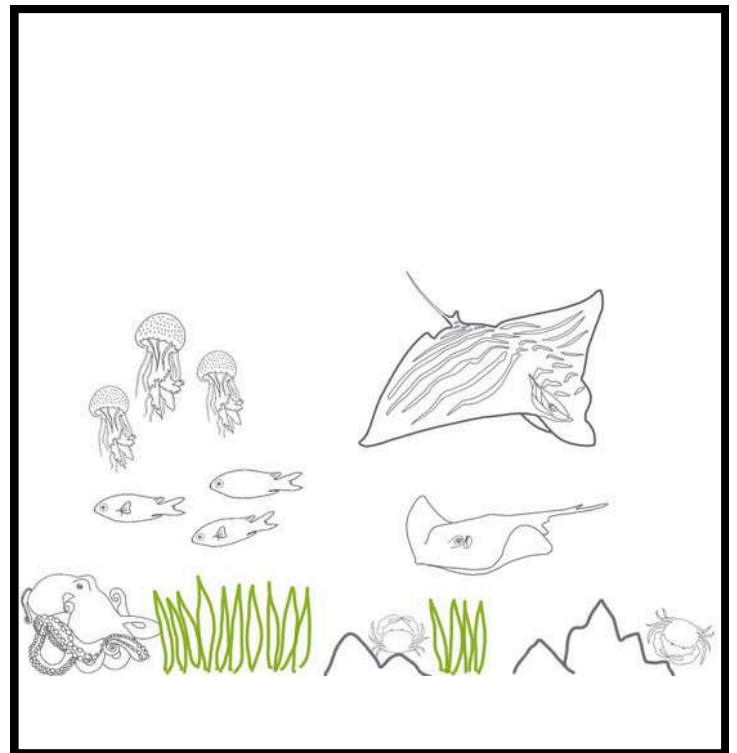
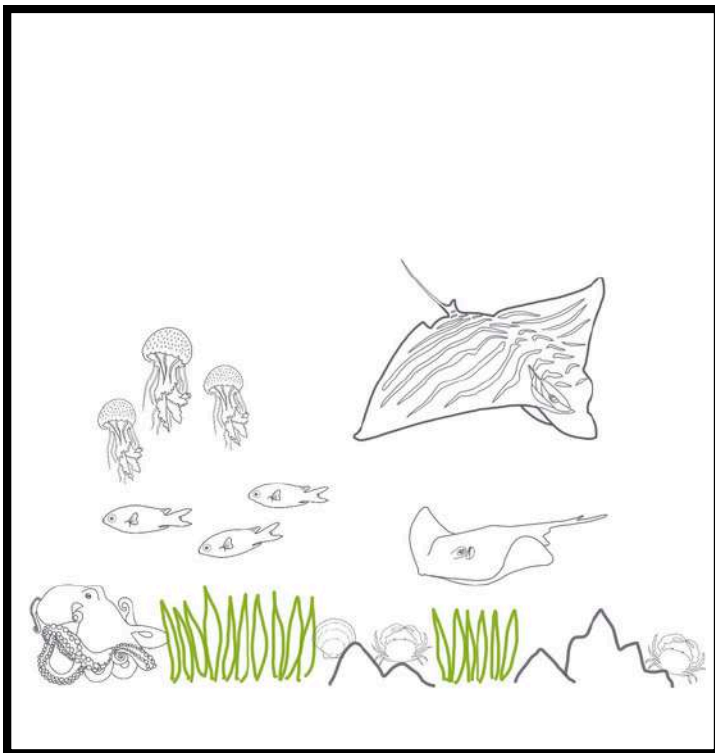
# LOST BULL RAY

This Bull ray got lost and can't find its food. Can you help it?



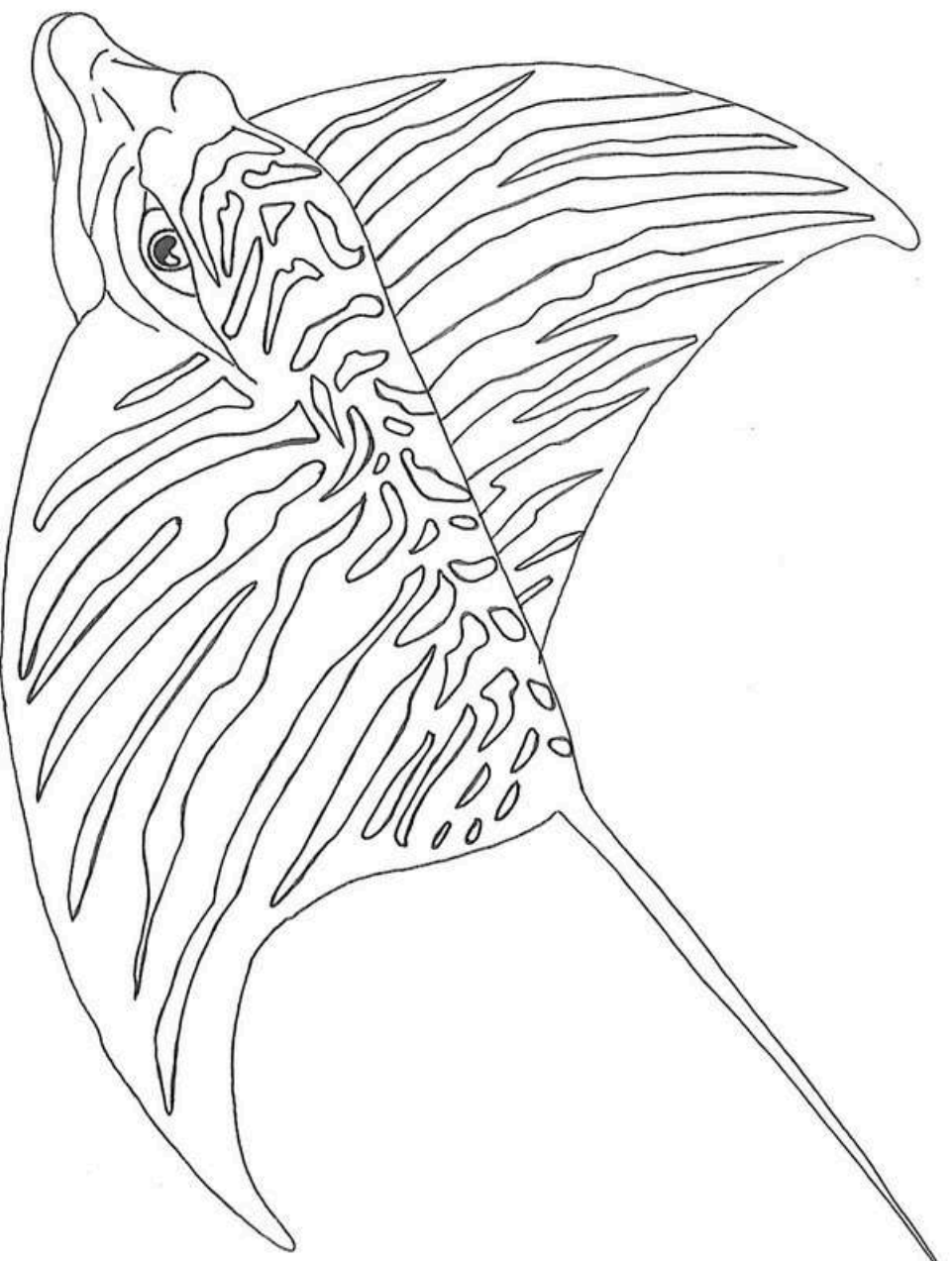
# SPOT THE DIFFERENCE

Can you spot the 5 differences between these underwater scenes?



# COLOUR THE BULL RAY IN!

Question: What food do I eat?



Answer: Crabs, squid and shellfish

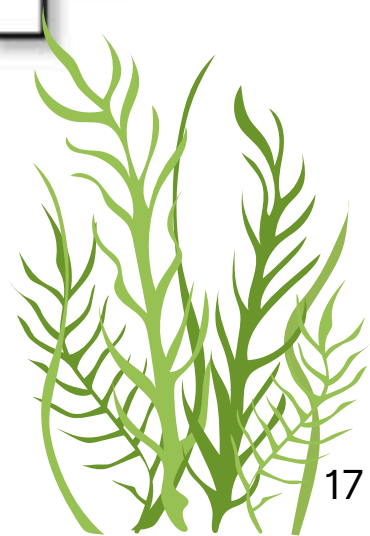
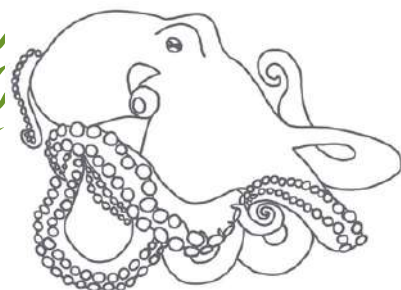
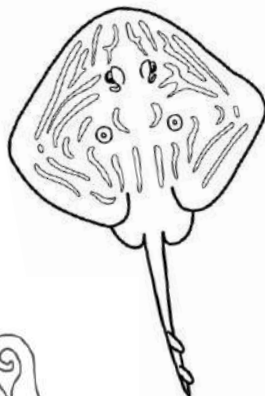
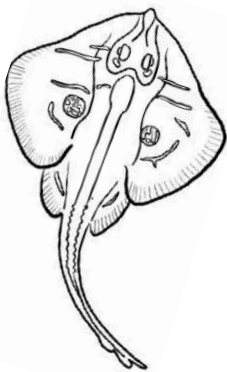
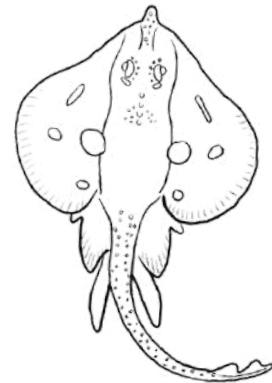
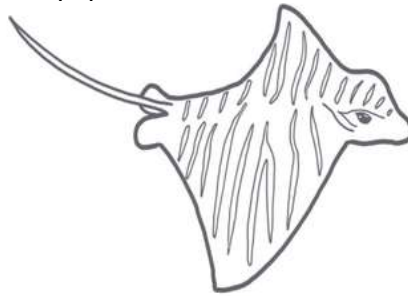
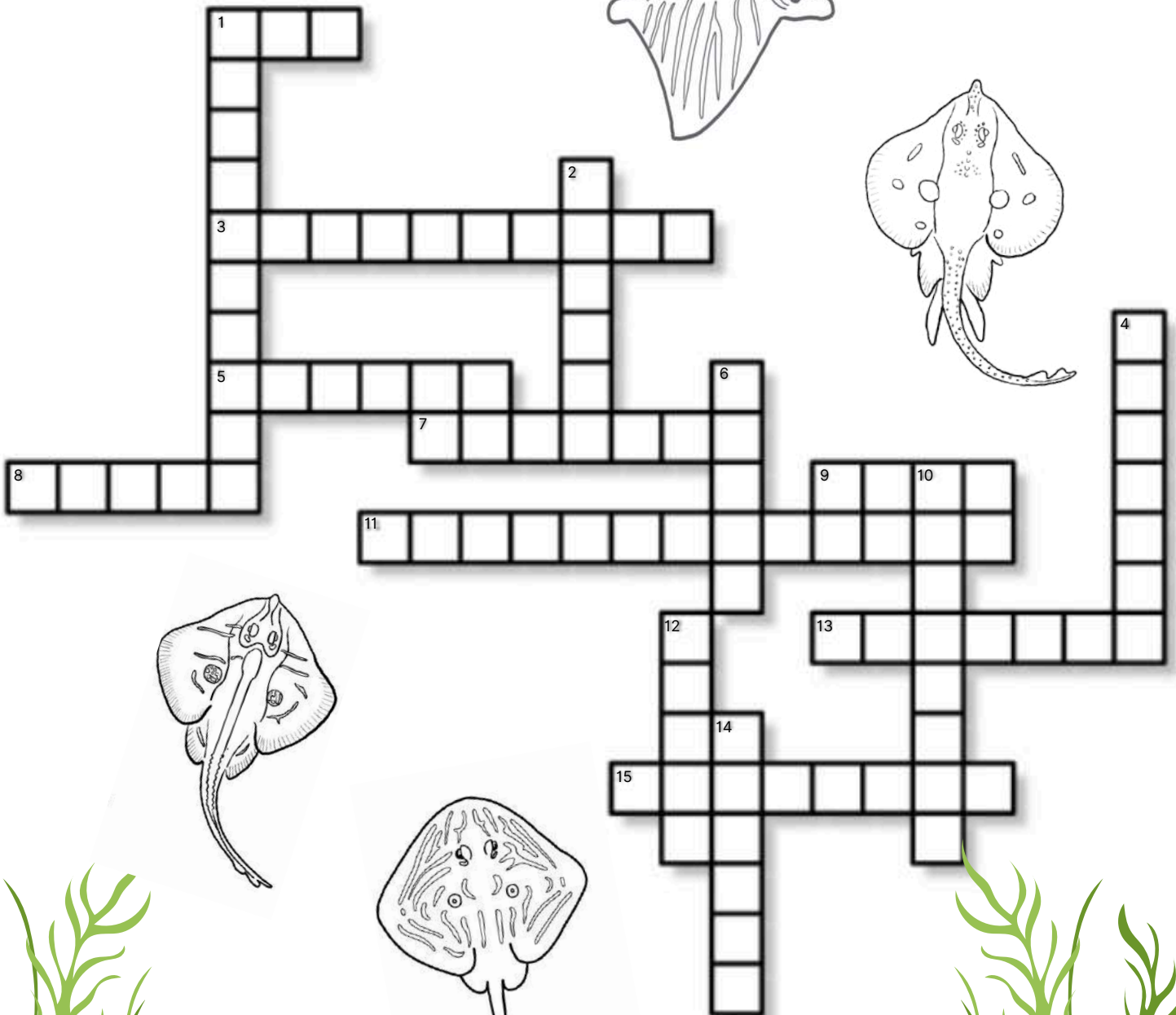
# CROSSWORDS

## Across

1. Name of a baby shark or ray
3. The dying out of a species
5. A small piece of land surrounded by water
7. Catching unwanted fish when fishing
8. Large expanse of natural water
9. Ocean animals with gills and fins
11. Group name for all sharks, rays, and skates
13. Where babies live
15. Circle ray with a pointy barb on its tail

## Down

1. Keeping something safe
2. A small island off the south of Malta
4. A diamond shaped ray with stripes on its back
6. Cartilaginous predatory fish
10. An organisation dedicated to shark and ray research
12. Country in the central Mediterranean
14. The sport of swimming underwater with breathing equipment



**For more information contact us on:**

sharklabmalta.science@gmail.com

or

info@sharklab-malta.org

**Sharklab-Malta**

Fairfields

9 Triq is-Sirti,

San Ġwann,

SGN 1840,

Malta

**Keep track of updates on our social media!**



***"In the end we will conserve only what we love; we will love only what we understand; and we will understand only what we are taught."***

**Baba Dioum**

