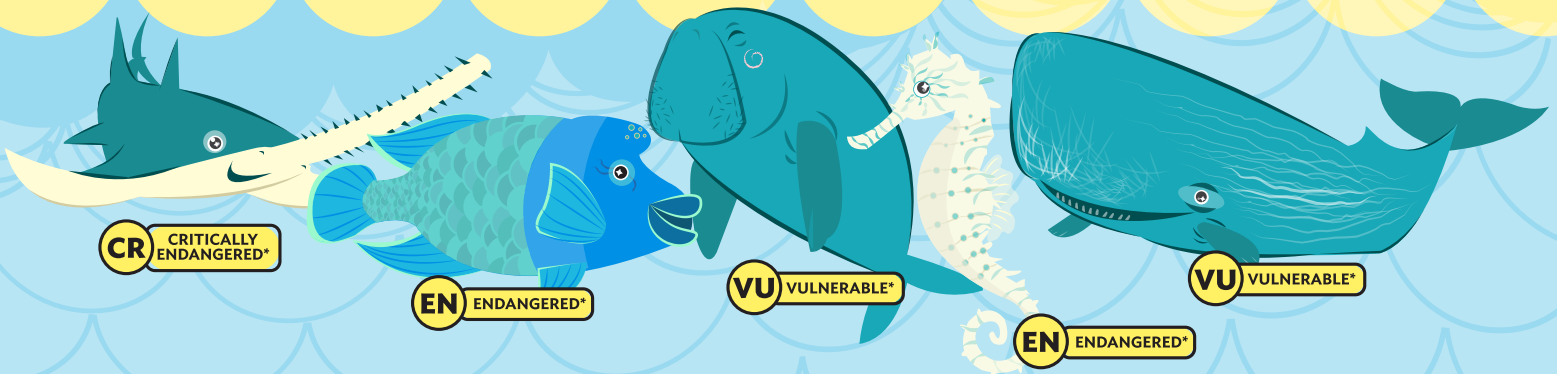




**treasures of the  
coral triangle**  
MINIGRAPHICS





**treasures of the  
coral triangle**  
MINIGRAPHICS  
II



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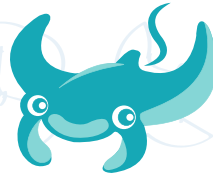
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Coastal and Marine Resources Management in the Coral Triangle - Southeast Asia (CTI-SEA)  
502 Manila Luxury Condominium, Ortigas Center, Pasig City, Philippines  
Tel +63 2 910 4565  
[www.ctisoutheastasia.wordpress.com](http://www.ctisoutheastasia.wordpress.com)

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Feature articles written by Panji Brotoisworo with edits by Raul Roldan. Art created by Dana Salono.

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**treasures** of the  
**coral triangle**  
MINIGRAPHICS

## About

The [Treasures of the Coral Triangle Minigraphics](#) series showcases 10 protected marine wildlife in the Coral Triangle. It aims to raise awareness about treasures at risk.

A bite-size and share-friendly version of the [Philippine Protected Aquatic Posters](#), it highlights the importance, threats, laws, and practical ways to protect threatened marine species. The series includes one feature article and minigraphics for each animal.

Module 2 features five threatened marine animals which are the sawfish, the sperm whale, the humphead wrasse, the dugong, and the seahorse.

## Who can use it?

Educators, students, science club members, and marine wildlife advocates can use the Treasures of the Coral Triangle Minigraphics series for school, community, and personal use.

## How to use it?

Originally designed to raise awareness online, the modules are [available for download](#) and can be used for both online and on-the-ground awareness campaigns.

The module is designed to gamify learning and engage participants through quizzes. There are two questions for each animal. The first question introduces the mystery animal and the second question pertains to the animal's unique attribute or importance.



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# **Sawfish**

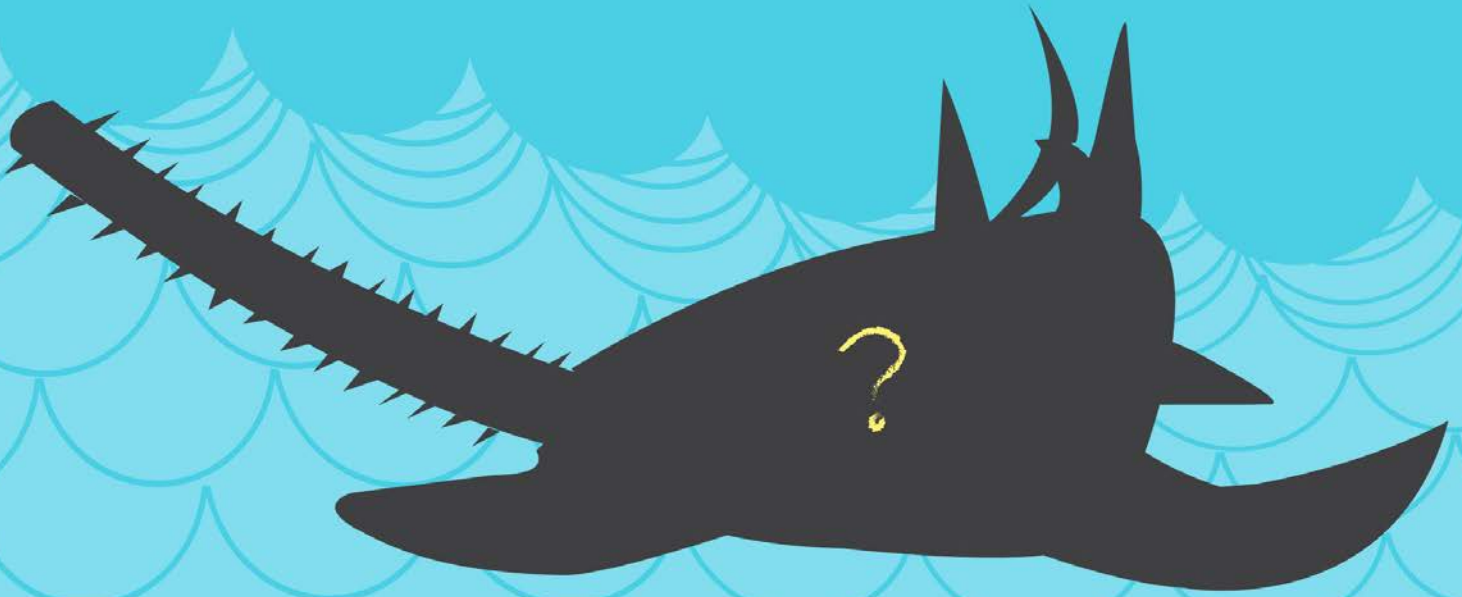
## ***The Super Senser***





**My beak is more than just a weapon.**

***WHAT AM I?***



**“Can you guess what I am?”**

**I use my special bladed beak to find prey.”**

# sawfish

*the super senser*



**its saw-like beak called the rostrum is used for finding food in muddy waters where it often lives**



**hunted for its fins for shark fin soup**



**critically endangered (IUCN Red List)**

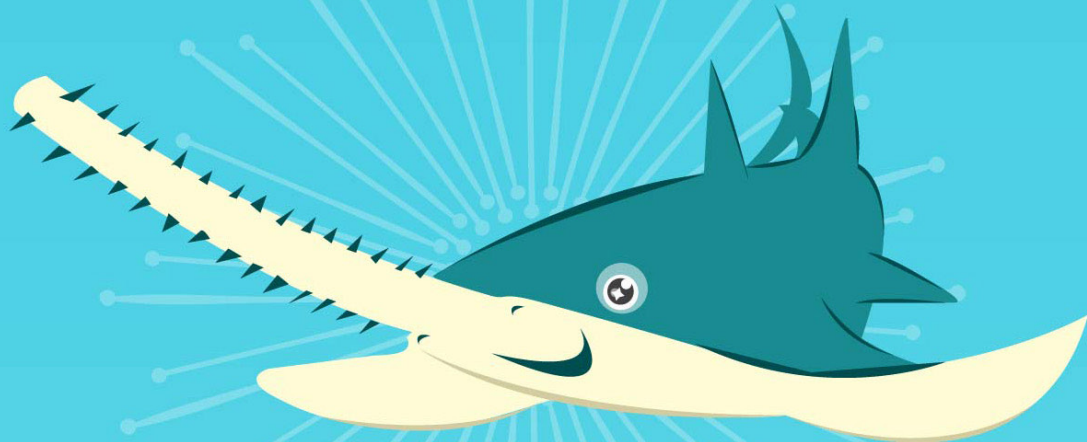
**“I’m the sawfish!**

**My super-sensing saw-like beak looks cool--and humans thought it was okay to take it as souvenir. It’s #marinemadness!”**

# sawfish

## *the super senser*

“I’m one of the top predators in shallow waters!”



**CR** CRITICALLY  
ENDANGERED\*

\*FACING AN EXTREMELY HIGH RISK OF EXTINCTION IN THE WILD



### UNIQUENESS

Its amazing saw-like beak is called a rostrum. It is packed with sensors for better hunting. The sawfish looks like a shark but is actually a type of ray.



Overfishing caused the decline of its population. Its rostrum is traded for traditional medicine and its fins can fetch up to US\$4000 for one soup set.



### MAJOR THREATS

- Can get easily tangled in nets and drown
- Highly sought after for its rostrum and fins



### DO

Share this minigraphic to shed awareness on the plight of the sawfish.



### DON'T

Buy sawfish products like the rostrum and sawfish fins.



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# Sawfish: The Super Senser

- Genus: *Pristidae* spp.
- Despite their fearsome appearance, they do not attack people unless provoked or surprised.
- The bladed snout can be used by the sawfish to catch prey by swinging it back and forth to stun or cut fish and dig bottom sediments to search for food.
- All species considered endangered or critically endangered by the International Union for Conservation of Nature (IUCN).

## Distribution

Sawfishes are widely distributed across [tropical and warm temperate nearshore waters](#) in the Atlantic and Indo-Pacific. They are found in coastal waters such as lagoons, estuaries, and brackish river deltas. Some species can penetrate rivers and large lakes. These fishes tend to prefer shallow, muddy, brackish water, spending most of their time on or near the seabed.

They were once abundant from the 19th century to the early part of the 20th century but today, the different sawfish species have a fragmented population and in some areas are considered to be locally extinct. Sawfish prefer shallow, coastal waters and even swim into freshwater river systems. There are no formal studies done on the size of the global sawfish population; data is mostly dependent on [fish landing data and personal anecdotes](#) from fishing communities which show that the once abundant sawfish is now an increasingly rare sight all over the world.

Sawfishes are known to be present in all Southeast Asian countries in the Coral Triangle, namely Indonesia, Malaysia, and the Philippines (CT3) although they are increasingly becoming very rare. The largetooth sawfish were once considered common in the Philippines but none have been recorded in recent surveys.

## Why they are important

Sawfishes are among the [top predators](#) in the shallow coastal environment. They help keep the lagoon and estuarine ecosystems healthy by regulating populations of prey species, as they weed out the sick, old, and weak members of their prey.

## Biology

Like sharks, sawfishes lack a swim bladder and use a large, oil-filled liver to control their buoyancy. Their skeleton is made of cartilage. Because they prefer to live in muddy habitats, their eyes are underdeveloped and their rostrum serves as their main sensory device.

Not much is known about the reproductive habits of the sawfish other than they have a slow reproductive rate. They reach sexual maturity at around 10 years old and produce only a few young after they mate which makes their population slow to recover. Females are [ovoviviparous](#), bearing live young or pups, whose rostral blades are soft and flexible during embryonic development, with teeth that are enclosed by a sheath – so as to protect the mother during the birthing process.

## Threats

Overfishing is one of the biggest threats to the sawfish due to their slow reproductive cycle. They are primarily fished for their fins and rostrum; the demand for the meat is not as big. The meat is often only locally sold compared to the bile, liver, and rostrum which are traded internationally for traditional medicine. Sawfish fins are highly sought after for making shark fin soup and can fetch up to \$4,000 USD for one set. Their rostrum are sold as curios or souvenirs in some cultures. Also, the loss of mangrove forests and other nursery habitats contributes to the decline of sawfish populations.



[“The saw of a sawfish, on display at Bedford Museum” \(CC0 1.0\)](#)

The sawfish's rostrum makes it especially vulnerable to bycatch because it can get easily tangled in nets, the teeth on the rostrum can easily grab the net and they will often drown because sawfish need to continuously swim in order to breathe.





*[“Sawfish” by Simon Fraser University \(CC-BY 2.0\)](#)*

## What we can do

- **Avoid using nets in rivers or estuaries.** These environments are the preferred habitats of the sawfish and their sword-like rostrum makes it very easy for them to get tangled and drown.
- **Do not buy sawfish products.** These include souvenir rostrums and traditional medicine that uses sawfish liver, skin, oil, and bile. Do not patronize restaurants that serve shark fin soup which can use sawfish fins and those of protected shark species. [Sawfish products are banned from international trade.](#)
- **Spread awareness about their struggle.** Share this article and other sawfish related information amongst your friends and let them know that we must protect this species!

## Laws that protect sawfishes in the CT3

### *Indonesia*

- [Convention on International Trade in Endangered Species of Wild Fauna and Flora \(CITES\)](#)
- [Indonesia ratified CITES into a Presidential Decree \(No. 43/1978\)](#)

### *Malaysia*

- [Convention on International Trade in Endangered Species of Wild Fauna and Flora \(CITES\)](#)
- [Fisheries \(Control of Endangered Species\) Regulation of 1999](#)

### *Philippines*

- [Convention on International Trade in Endangered Species of Wild Fauna and Flora \(CITES\)](#)
- [Philippine Fisheries Code of 1998 \(RA 8550\)](#)
- [Wildlife Resources Conservation and Protection Act \(RA 9147\)](#)

## Resources

- [Read the online feature.](#)
- [Download the minigraphics.](#)
- [Download the Treasures of the Coral Triangle Modules.](#)

## Quiz

**The sawfish are most famous for their rostrum, the saw-like nose. How do the sawfish use their rostrum?**

# **Sperm Whale**

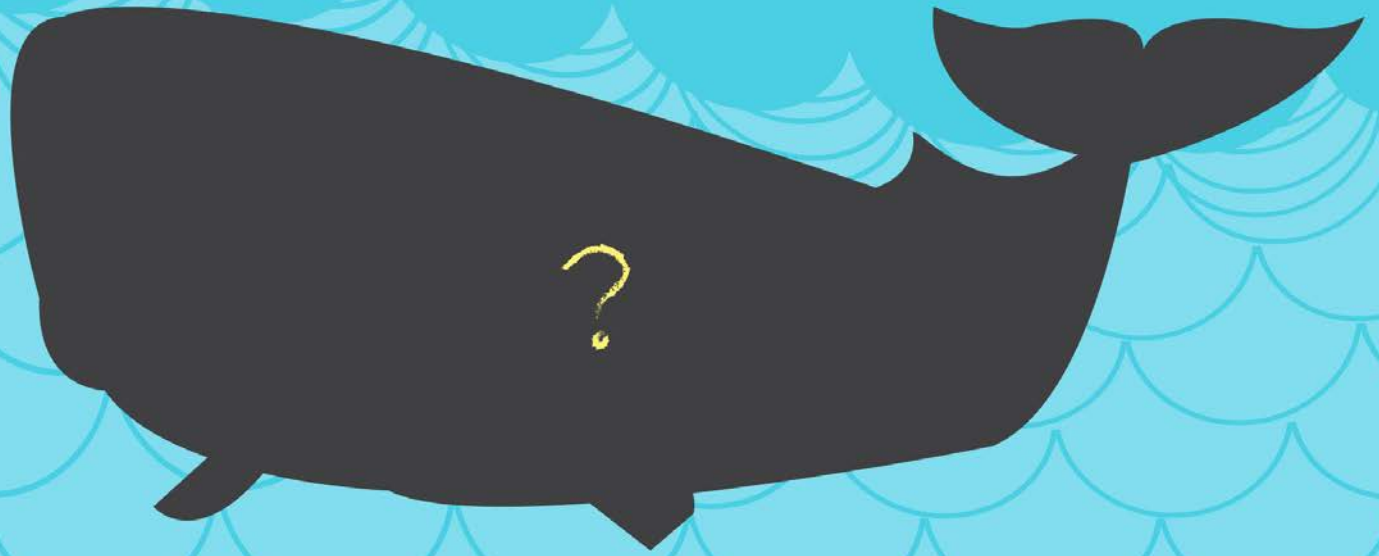
## ***The Big Teeth***





**The giant squid is my nemesis.**

***WHAT AM I?***

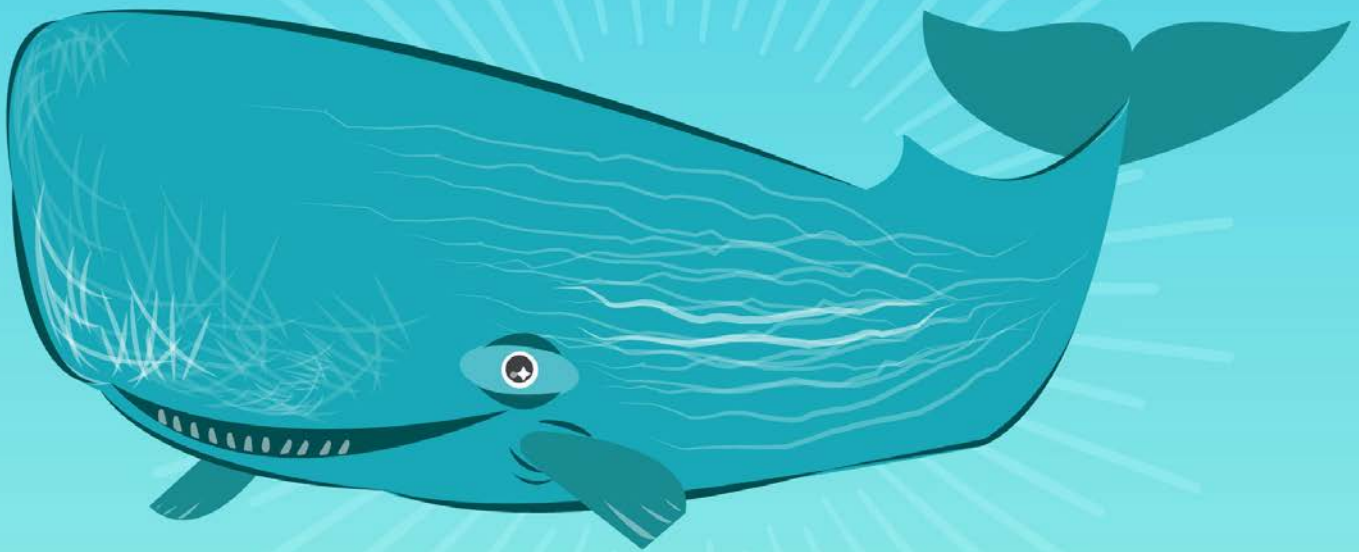


**“Can you guess what I am?”**

**I’m Captain Ahab’s majestic beast in the novel written by Herman Melville. It was published in 1851 when whale hunting was at its peak.”**

# sperm whale

## *the big teeth*



**the largest toothed  
whale and toothed  
predator**



**hunted for its  
spermaceti, a liquid wax  
used in cosmetics**



**vulnerable  
(IUCN Red List)**

**“I’m the sperm whale!**

**My name comes from “spermaceti,” the liquid wax inside my head. People hunt me for my spermaceti which they use for making cosmetics and candles. It’s #marinemadness!”**



# sperm whale

## *the big teeth*

“I’m the largest toothed predator!”



\*FACING A HIGH RISK OF EXTINCTION IN THE WILD



### UNIQUENESS

It has the largest brain of any known creature in the planet. Its head contains spermaceti, which is used for echolocation.



A sperm whale loves to hunt squid. Deep sea squids have been found in its stomach. Recently, plastic and car parts were found in the stomachs of sperm whales too.



### MAJOR THREATS

- Plastic pollution
- Noise from ships or drilling for oil
- Hunted for spermaceti, which is used in cosmetics



### DO

Spread awareness about sperm whales by sharing this minigraphic.



### DON'T

Throw plastic anywhere because it can end up in the ocean and get eaten by marine animals.



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# Sperm Whale: The Big Teeth

- Scientific name: *Physeter macrocephalus*
- Has the largest brain of any known creature both in body to brain ratio and physical size
- Uses sounds to communicate with each other and to search for prey
- Considered to be vulnerable by the International Union for Conservation of Nature (IUCN)

## Distribution

The sperm whale is typically found in the open water and is found all over the world except in the cold waters of the Arctic and Antarctic. They can be found swimming in depths of up to [3 kilometers but they are often found in depths of around 1 kilometer](#) because that is where their favorite food is located, deep-water squid. According to the IUCN, it is estimated that the global population of the sperm whales has [at least 100,000](#) whales during a study conducted in 2002.

Sperm whales are present in all Southeast Asian countries in the Coral Triangle, which are Indonesia, Malaysia, and the Philippines or the CT3. In the Philippines, sperm whales are regularly sighted in Tañon Strait, one of CTI-SEA's project sites.

## Why they are important

Sperm whales help keep the marine ecosystem healthy by regulating the flow of food and helping to maintain a stable marine food chain. They ensure that certain animal species which they prey upon do not overpopulate the ocean. Even their feces play an important role by helping offset carbon in the atmosphere. Nutrients in their “poop” stimulate the growth of phytoplankton which serve as food for a lot of marine creatures including the whale shark. Phytoplanktons use the carbon from the atmosphere resulting in a cleaner and healthier environment for man and animals alike. It is estimated that as much as 400,000 tons of carbon are extracted from the air due to these whales each year.

The death of a whale is also beneficial for the marine environment. When a whale dies and sinks to the bottom of the ocean it [provides an incredible amount of nutrients](#) to scavenger communities that live at the bottom of the ocean floor. These are areas that are so deep that sunlight cannot reach them, so the main source of energy and nutrients for these communities would be animal remains that sink to the bottom.

## Biology

Sperm whales are one of the largest animals in the world and can weigh up to 45 tons and measure up to 60 ft in length – that’s as heavy as a big truck and as long as a bus! They grow to this amazing size by feeding primarily on fish and squid, often consuming [900 kg of food per day](#).

Sperm whales are a social species and have been noticed to swim together in groups, also known as pods. The whales communicate with other whales using sound and scientists theorize that each [region might have its own language](#) because they noticed certain clicking patterns that only exist in certain areas of the world. They also use sound for echolocation which allows the sperm whale to detect where large squid and fish are. They make clicking sounds which goes out towards the open ocean. This sound wave travels until it hits something like a large squid and it bounces back. Sperm whales are able to detect from where the sound bounces back and know where their food is.

They have a slow reproductive rate taking 9 years for a female sperm whale to reach sexual maturity and at least 11 months for her to produce a single baby sperm whale, also known as a calf. This makes their population vulnerable to many threats including overfishing and it can take a long time for a whale population to recover.

## Threats

Whaling is one of the primary threats to the sperm whale; it is still practiced in only a few countries such as [Japan, Norway, and Iceland](#). Sperm whales are primarily hunted for their meats and for a substance called [spermaceti](#) which is found in the sperm whale’s head. Spermaceti was widely popular before the international ban and was used in candles, lubricants, and cosmetics. Jojoba oil, which is a plant-based oil, is now used as a replacement for spermaceti. Despite a ban from international trade in 1981 and an international ban on commercial whaling in 1986, spermaceti is still used in some cosmetic products around the world.

Noise from ships or drilling for oil disturbs the whale’s ability to communicate and hunt for food. It can be hard for whales to distinguish the sounds made by other whales if loud drilling is occurring. Other species of whales have also been known to get stranded as a result of dynamite fishing as the blast can damage their ability to hear and navigate.

Marine pollution is also a serious threat to whales as toxic substances – including oil, chemical spills, and human waste – can damage their habitats or directly kill them. Whales can die after swallowing or becoming entangled in plastic bags and fishing nets.



*[“Mother and baby sperm whale” by Gabriel Barathieu \(CC BY-SA 2.0\)](#)*

## What we can do

- **Do not buy products that use spermaceti.** Before you buy a cosmetic product, double check to see if the product uses jojoba oil instead of spermaceti oil.
- **Do not eat whale meat.** Whale meat is still considered a delicacy in a few countries but international trade for whale meat is banned. The killing of whales will stop if there is no market for its meat and other whale products.
- **Practice proper solid waste management.** Throw away trash in trash cans and other proper areas and do not just throw them on the ground or in the water.
- **Spread awareness.** Tell your friends about the sperm whale’s plight by sharing this article and other articles that show the importance of marine mammals and why we need to protect them.



## Laws that protect sperm whales in the CT3

### *Indonesia*

- [Convention on International Trade in Endangered Species of Wild Fauna and Flora \(CITES\)](#)
- [Indonesia ratified CITES into a Presidential Decree \(No. 43/1978\)](#)
- [Act No. 5 of 1990 \(Conservation of Living Resources and their Ecosystems\)](#)

### *Malaysia*

- [Convention on International Trade in Endangered Species of Wild Fauna and Flora \(CITES\)](#)
- [International Trade in Endangered Species Act of 2008](#)

### *Philippines*

- [Convention on International Trade in Endangered Species of Wild Fauna and Flora \(CITES\)](#)
- [Philippine Fisheries Code of 1998 \(RA 8550\)](#)
- [Bureau of Fisheries and Aquatic Resources FAO 185-1](#)

## Resources

- [Read the online feature.](#)
- [Download the minigraphics.](#)
- [Download the Treasures of the Coral Triangle Modules.](#)

## Quiz

**It is beneficial when whales release their waste in the water, this is important to the marine ecosystem because of a system known as the “whale pump.” What is the whale pump and how does it work?**

# **Humphead Wrasse**

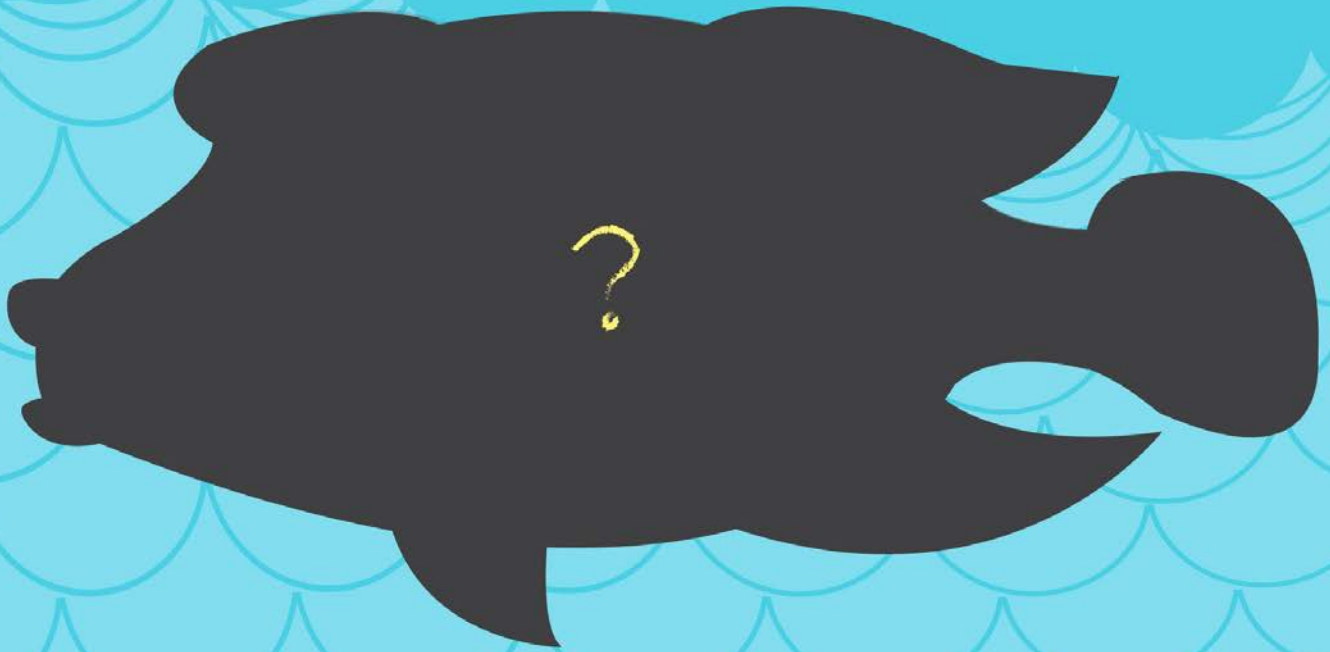
*The Reef Defender*





**I eat the crown-of-thorns starfish.**

***WHAT AM I?***



**“Can you guess what I am?”**

**I live long and stay in the coral reefs. I have a curious hump on my head.  
The crown-of-thorns starfish is my fave dish!”**

# humphead wrasse

*the reef defender*



**eats the crown-of-thorns  
starfish which damages  
coral reefs**



**threatened by  
cyanide fishing**



**endangered  
(IUCN Red List)**

**“I’m the humphead wrasse!**

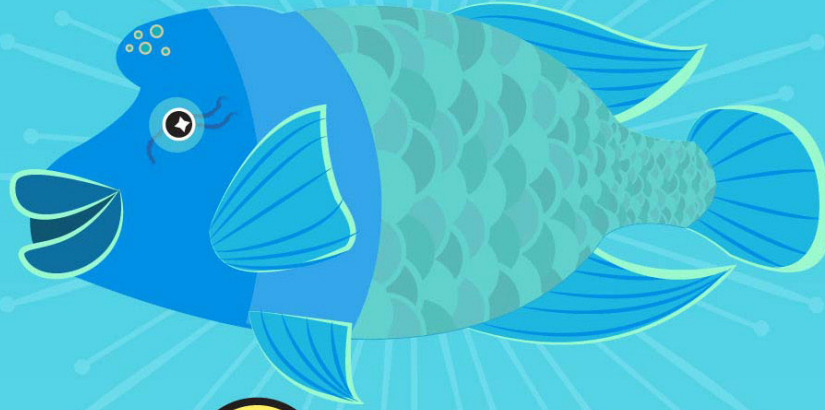
**I’m sold as luxury food and aquarium fish so now I’m endangered. It’s  
#marinemadness!”**



# humphead wrasse

## *the reef defender*

“I eat the crown-of-thorns starfish that damages coral reefs!”

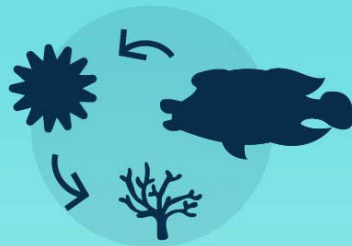


\*FACING A HIGH RISK OF EXTINCTION IN THE WILD



### UNIQUENESS

One of the few animals that eats the crown-of-thorns starfish. This starfish feeds on corals and can eat up to 65 feet of living corals in a year.



The humphead wrasse is a very rare animal that is overfished. It is one of the most expensive fish in the live reef food fish trade and is sold for over US\$100 per kilogram.



### MAJOR THREATS

- Caught live with cyanide which is toxic to humans, corals, and other reef fish
- Coral reef degradation and pollution



### DO

Urge local governments to come up with regulations to stop the humphead wrasse trade.



### DON'T

Buy humphead wrasses or other reef fish for aquariums or food.



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# Humphead Wrasse: The Reef Defender

- Scientific name: *Cheilinus undulatus*
- Like many reef fishes, a humphead wrasse can change its sex starting out as a female and becoming a male wrasse around the age of 9.
- Protects coral reefs by eating the deadly crown-of-thorns starfish
- Considered to be endangered by the International Union for Conservation of Nature (IUCN), listed under Convention on International Trade in Endangered Species of Wild Fauna and Flora CITES Appendix II.

## Distribution

The humphead wrasse is found within the [Indo-Pacific region all the way to the coasts of East Africa](#). Younger humphead wrasses typically live closer to the coast where dense coral reefs are located while adults can also be found further away from the coast in lagoons and channel slopes in depths up to 100 meters.

The species is naturally rare, with recorded maximum adult density of not more than 20 fish per 10,000 m<sup>2</sup>. [The population has reduced by 50% over the course of 30 years](#).

The Napoleon wrasse is found in the Southeast Asian countries in the Coral Triangle which are Indonesia, Malaysia, and the Philippines or CT3. In the Philippines, its common name is *mameng*.

## Why they are important

Humphead wrasses are one of the defenders of the coral reef. They are one of the few species that can eat the [Crown of Thorns \(COT\)](#), a poisonous starfish that feeds on coral polyps. An individual crown of thorns starfish can consume up to 6 square meters (65 ft) of living coral reef in a year; hence the need to protect predators of COT like the humphead wrasse and triton shell to control COT population.

Coastal communities benefit from the humphead wrasse because it is a popular species for [dive tourism](#) due to its size, gentle nature, and bright colors.

## Biology

The fish is easily identified by its lips, the bump located on its head, and by 2 black lines that are typically located next to the eyes. The species can also come in a wide range of different colors from blue, green, or a red which makes them a spectacular fish to see.

The species has an estimate life span of at least 30 years and there have been humphead wrasses that have reached a length of 2 meters and weighed up to 190 kilograms. This long reproductive cycle makes them very prone to overfishing because it will take them a long time to recover. They are known to be [protogynous hermaphrodites](#), which means that some of the female humphead wrasses will change their sex and become male.

Humphead wrasse feed primarily on molluscs, fish, sea urchins, crustaceans, echinoderms, and other invertebrates, using their strong teeth.

They demonstrate a reproductive strategy of spawning aggregation, whereby sexually mature adults from adjacent reefs gather at specific sites to mate.

## Threats

Even before the species was overfished, the humphead wrasse was a [naturally rare fish](#). They have a long reproductive cycle which takes at least five years to reach sexual maturity. The humphead wrasse is one of the popular [species used in the live reef food fish trade \(LRFFT\)](#), a lucrative but unsustainable industry where the fish are kept alive when caught and sold for high prices either for food or for the aquarium business. The humphead wrasse does not have a large market share in the LRFFT due to its rarity but it is one of the most valuable selling for [over \\$100 USD per kilogram](#) in the retail market.

In order to mate, the species would congregate in large numbers which can easily reach more than 100 individual humphead wrasses. These spawning aggregations make them easy targets for fishermen.

The coral reefs, the preferred habitat of the humphead wrasses, are under threat from the effects of [climate change and human pressures](#). One of the most prominent threats associated with the LRFFT is cyanide fishing. Cyanide stuns the fish which allows fishermen to easily catch them. However, cyanide is toxic to humans, coral polyps, and other reef residents and its prolonged use will end up destroying the reef ecosystem.



*“DSCF1886 Napoleonfish” by Clifton Beard (CC BY-NC 2.0)*

## What we can do

- **Do not purchase groupers or humphead wrasses.** Fishers will continue to harvest groupers or humphead wrasses if there are people that are willing to pay for it. If you see it at the market, don't buy it. If more people refrain from buying it then fishers will have less incentives to harvest these species.
- **Do not use reef fish for an aquarium.** The LRFFT isn't only for food; fishermen are able to sell live reef fish for aquariums because of their visual qualities and size. Show your support for the protection of reef fish and let them live in their natural environment instead of an aquarium.
- **Share information about the importance and status of napoleon wrasse.** Raise awareness by telling your friends and family to avoid eating groupers and humphead wrasses. Share any information including this article to spread awareness.



## Laws that protect humphead wrasses in the CT3

### *Indonesia*

- [Convention on International Trade in Endangered Species of Wild Fauna and Flora \(CITES\)](#)
- [Indonesia ratified CITES into a Presidential Decree \(No. 43/1978\)](#)
- [Ministry Decree of Ministry of Forestry of Republic of Indonesia \(No. 447/Kpts-II/2003\)](#)

### *Malaysia*

- [Convention on International Trade in Endangered Species of Wild Fauna and Flora \(CITES\)](#)
- [International Trade in Endangered Species Act of 2008](#)

### *Philippines*

- [Convention on International Trade in Endangered Species of Wild Fauna and Flora \(CITES\)](#)
- [Philippine Fisheries Code of 1998 \(RA 8550\)](#)
- [Wildlife Resources Conservation and Protect Act \(RA 9147\)](#)

## Resources

- [Read the online feature.](#)
- [Download the minigraphics.](#)
- [Download the Treasures of the Coral Triangle Modules.](#)

## Quiz

**Humphead wrasses and several other reef fishes have the ability to change their gender. Why does the humphead wrasse change its gender?**

# Dugong

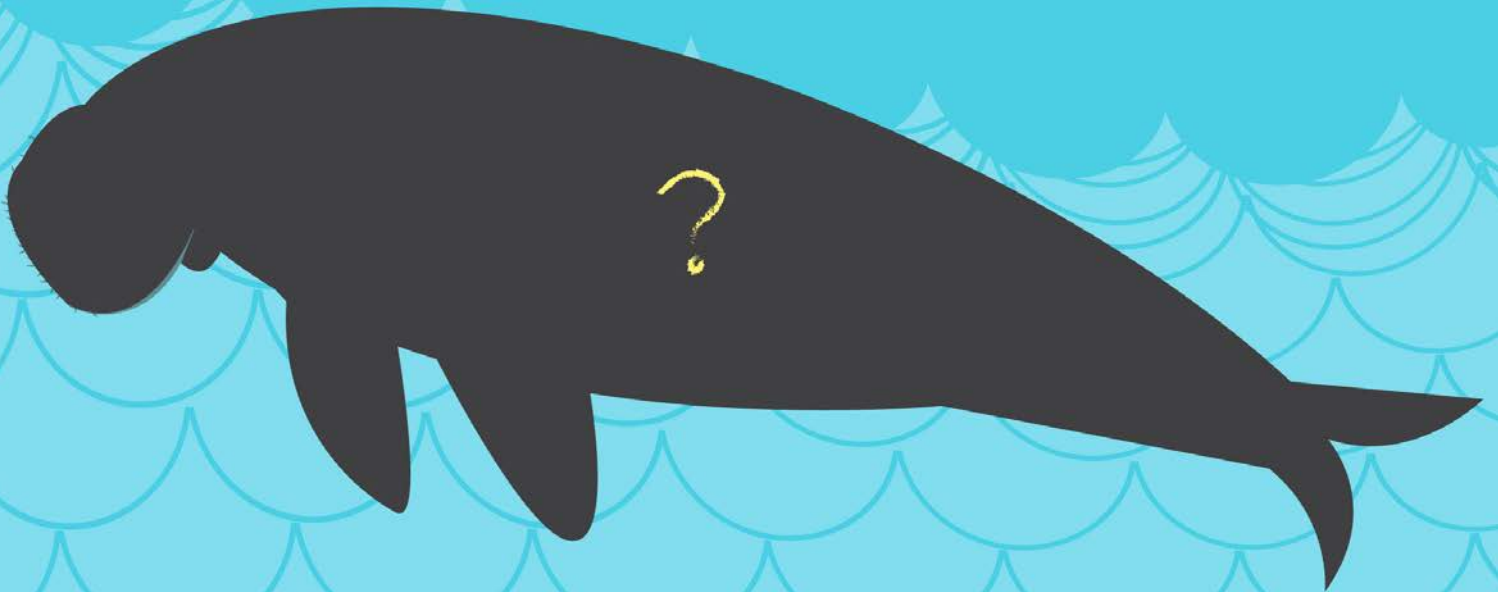
## *The Sea Cow*





# I love to eat seagrass.

## WHAT AM I?

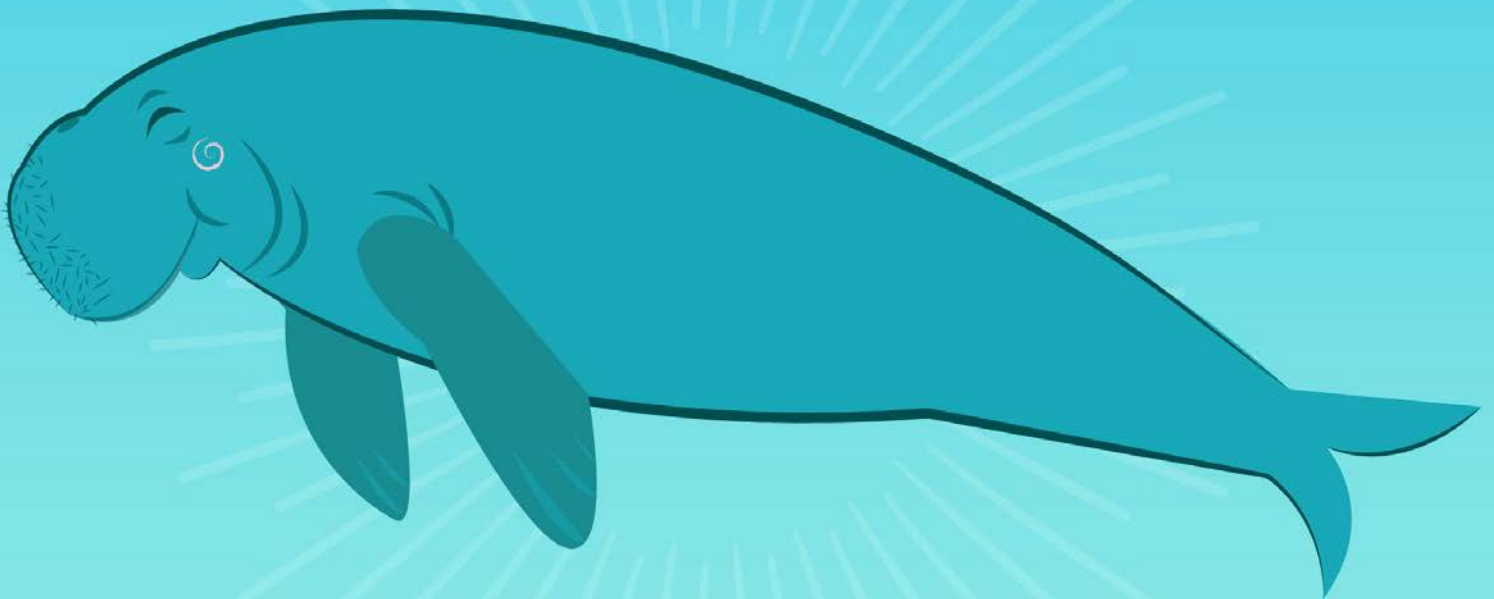


**“Can you guess what I am?”**

My name comes from the Malay ‘duyung’, which means ‘lady of the sea’. People thought I’m a mermaid but I’m more related to the elephant. I love to stay near the shore where there’s a lot of seagrass!”

# dugong

*the sea cow*



**strictly vegetarian,  
primarily eats  
seagrass**



**mistaken for  
mermaids by sailors  
hundreds of years ago**



**vulnerable  
(IUCN Red List)**

**"I'm the dugong!"**

I'm most happy when I graze on seagrass beds, which are also called the 'lungs of the sea.' Unfortunately, seagrass is sensitive to pollution so now I have less and less seagrass to eat. It's #marinemadness!"

# dugong

## *the sea cow*

“I eat a lot of seagrass and keep seagrass beds healthy!”



\*FACING A HIGH RISK OF EXTINCTION IN THE WILD



### UNIQUENESS

It is strictly vegetarian and lives near the coasts where seagrass is available. It can consume up to 50 kg of seagrass in a day!



Seagrass beds are home to many important fish and crustaceans. The dugong helps seagrass grow when it grazes on or “prunes” sea grass meadows.



### MAJOR THREATS

- Pollution which kills off sea grass meadows
- Hunted for its meat
- Accidentally caught in nets or hit by boats



### DO

Spread awareness about dugongs by sharing this minigraphic.



### DON'T

Step on seagrass meadows.



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# Dugong: The Sea Cow

- Scientific name: *Dugong dugon*
- These mammals are strictly vegetarian and can eat up to 50 kg of seagrass every day.
- Centuries ago, sailors mistook them for the mythical mermaids because of their ability to do “tail stands” in shallow water.
- Considered vulnerable by the International Union for Conservation of Nature (IUCN)

## Distribution

Dugongs live near the coast in areas that can support their diet of sea grass. They are sometimes found in deep ocean water but they are most often found in areas that are only up to 5 meters deep. They can be found from the waters of east Africa all the way to Australia and Indonesia. The World Wildlife Fund (WWF) has estimated that there are [up to 85,000 dugongs in the world](#) with most of them living in northern Australia.

Dugongs are found in all Southeast Asian Coral Triangle countries, which are Indonesia, Malaysia, and the Philippines or the CT3. In the Philippines, the dugong population has been greatly reduced due to hunting, pollution, and diminishing habitat. Palawan is one of the dugong’s last strongholds.

## Why they are important

Dugongs help maintain productive coastal marine ecosystems by eating the sea grass that grow on the sea floor. When sea grasses are eaten it encourages the regeneration of more sea grass; studies have found that [this maintains or increases the level of productivity and nutrition of marine vegetation](#). When seagrass gets older its nutritional content degrades; therefore constant trimming of seagrass means a healthier marine ecosystem.

Dugongs are an indicator species of whether the seagrass ecosystem is healthy or not. Seagrass meadows are vital components of the entire marine ecosystem just like mangroves and coral reefs. A single acre of seagrass can support more than 40,000 fish and 50 million small invertebrates. Seagrasses can also be called the “lungs of the sea” because one square meter of seagrass can produce 10 liters of oxygen each day through photosynthesis.

Seagrasses are very sensitive and they are often suited for [clear waters and waters with low nutrient levels](#). Pollution from farming and industry poses a



[“Dugong” by flickker photos \(CC BY-SA 2.0\)](#)

threat to the dugong because if the sea grass starts to die, dugongs will have to migrate somewhere else in search of their favorite food.

## Biology

The dugong’s eyesight is not very effective and instead it relies more on its sensitive whiskers and sense of hearing. Dugongs make chirp, whistle, and bark sounds in order to communicate with other dugongs. They use their sensitive whiskers to detect vibrations from their surroundings and they use it to search for sea grass as they swim on the sea floor.

Dugongs can live up to 70 years old and can grow up to 3 meters long and weight up to 500 kg. They have a slow reproductive cycle and will reach sexual maturity at around 6-8 years old. It takes them one year to produce a single calf. The calf often stays with the mother for up to 18 months before starting its own life. There is little or no difference between the appearance of male and female dugongs although females may grow to be slightly larger than males.

Dugongs can only stay underwater for six minutes before needing to resurface to breathe. They are closely related to the manatee (sea cow) and are visually similar except that the tail of a manatee is shaped like a single paddle while the dugong has flukes similar to a whale.

## Threats

They are overfished as people still hunt them for their meat but the dugong's slow reproductive cycle means that the population is slow to recover and they are more vulnerable to extinction.

Dugongs are prone to threats such as boat strikes and by-catch because they like to stay in shallow coastal areas. Habitat loss due to pollution and overdevelopment are also contributing to the decline of the dugong species.

## What we can do

- **Minimize water pollution.** Don't treat the water as a trash can; throw away your garbage properly so that the waters can remain clean. Farmers should avoid runoff with fertilizers and pesticides from reaching the water as this will pollute coastal waters and contaminate seagrass beds
- **Travel slowly in shallow coastal areas.** Dugongs can only stay underneath the water for a maximum of 6 minutes so this means that they will frequently surface to get a breath of fresh air. Travelling slowly can give enough time for you and the dugong to avoid each other and prevent a boat strike.
- Share information about our threatened resources to raise awareness about their status and their importance.

## Laws that protect dugongs in the CT3

### *Indonesia*

- [Convention on International Trade in Endangered Species of Wild Fauna and Flora \(CITES\)](#)
- Decree from Department of Agriculture (No. 327/Kpts/Um/1972)
- Government Regulation No. 7 of 1999

### *Malaysia*

- [Convention on International Trade in Endangered Species of Wild Fauna and Flora \(CITES\)](#)
- [Fisheries \(Control of Endangered Species of Fish\) Regulations 1999](#)

- [International Trade in Endangered Species Act of 2008](#)
- [Protection of Wildlife Act 1972](#)
- Wildlife Protection Ordinance 1998 (State of Sarawak only)
- [Wildlife Conservation Enactment 1997](#)

### ***Philippines***

- [Convention on International Trade in Endangered Species of Wild Fauna and Flora \(CITES\)](#)
- [DENR Administrative Order \(DAO\) 1991-55](#)
- [DENR Administrative Order \(DAO\) 2004-15](#)
- [Philippine Fisheries Code of 1998 \(RA 8550\)](#)
- [Wildlife Resources Conservation and Protect Act \(RA 9147\)](#)

## **Resources**

- [Read the online feature.](#)
- [Download the minigraphics.](#)
- [Download the Treasures of the Coral Triangle Modules.](#)

## **Quiz**

**Without dugongs, what would happen to the marine ecosystem?**

# Seahorse

## *The Preggy Daddy*





# **My husband bears our babies.**

## ***WHAT AM I?***



**“I bet you can guess what I am!**

I love to hide among mangrove roots, seagrass, and corals. I look like a horse, but I’m actually a fish. In our world, the daddy carries the babies!”

# seahorse

## *the preggy daddy*



**the only animal in  
which the male carries  
the unborn babies**



**threatened because it is  
used as ingredient in  
traditional medicine**



**endangered  
(IUCN Red List)**

**“I’m the seahorse!**

**It’s hard to be pretty because either I’m sun-dried and sold as souvenir or  
caught live for aquarium trade! It’s #marinemadness!”**



# seahorse

## *the preggy daddy*

“I’m an important part of the food chain!”



\*FACING A HIGH RISK OF EXTINCTION IN THE WILD



### UNIQUENESS

The male seahorse carries the babies during pregnancy.



Dried seahorses can fetch up to US\$3000 per kilo for traditional medicine. But research shows that these medicines are not effective at all.



### MAJOR THREATS

- Sold as souvenirs and used for traditional medicine
- Pollution of seagrass and coral reef habitats



### DO

Support effectively managed marine protected areas since they serve as refuge for endangered animals.



### DON'T

Keep seahorses as pets or buy seahorse products.



treasures of the  
coral triangle  
MINIGRAPHICS

CTI-SEA

Coastal and Marine Resources Management  
in the Coral Triangle - Southeast Asia

IN PARTNERSHIP WITH



PSYSC™

# Seahorse: The Preggy Daddy

- Genus: *Hippocampus* spp.
- Different seahorse species are considered either vulnerable or endangered by the International Union for Conservation of Nature (IUCN).
- Wild seahorses are monogamous and spend their lives with one mate.
- Seahorses have no teeth and no stomach. Food passes through their digestive systems so quickly that they must always eat to stay alive.

## Distribution

The seahorse is found in coastal areas all over the world in both temperate and tropical waters. Seahorses are not very good swimmers so they often live in areas where they can seek shelter from strong currents such as mangroves roots, seagrasses, seaweeds, and coral reefs.

There are few formal studies on seahorse population. Their numbers are difficult to estimate because they hide and some species are small and hard to see, with the smallest seahorse species only being half an inch tall. [CITES currently recognizes 39 species of seahorse](#) and the IUCN has listed 9 seahorse species as vulnerable, 1 species as endangered. Twenty-eight species lack information and are listed as data deficient.

## Why they are important

Seahorses are important in the food chain, consuming tiny fish, small shrimp, and plankton and being consumed by larger fish such as tuna and rays, as well as crabs. They are of particular interest to science because of their interesting form and behaviors. Especially unique is the “male pregnancy” associated with seahorses and pipefishes with the males having a brood organ into which the female places her eggs, with the male caring for the eggs and giving birth.

## Biology

They are easily [identified](#) by their head which looks similar to a horse’s head, rough or bony skin, curled tail, and their preference to swim in an upright posture. They can curl their tail around seagrass blades and mangrove roots to prevent them from being dragged away by strong currents.

Seahorses are one of the few animals on the planet that have the ability to change the [color of their skin](#). They do this in order to blend in with their

environment and hide from predators such as other fish and to communicate with other seahorses.

Reproduction occurs via the female placing the eggs into the male's brood pouch, something similar to a uterus in humans. Each pregnancy can easily yield more than 100 young. The life span of a seahorse ranges from species to species, the smallest species only live up to a year while the bigger species can live from three to 5 years. They generally have a [fast life cycle](#) often hitting maturity at an early age, have high natural mortality, and multiple spawning per year.

## Threats

Increasing demand for seahorses are putting them at the risk of extinction and lack of population data for a lot of seahorse species means we don't know how big their vulnerability to extinction is. Pollution such as toxic chemicals or runoff is also harming the environment of the seahorse. Their preferred habitats are fragile and vulnerable to pollution.

Their unique features make them [a popular souvenir item](#) in the form of dried seahorses or as pets in the aquarium trade. However, seahorses are often stressed in aquarium environments and only a few manage to live long.

[Traditional medicine](#) makes them incredibly valuable for fishermen and retailers. They can often be sold from \$600 – \$3,000 USD per kilogram depending on the species. They are used as a natural aphrodisiac and cures for many ailments but scientific research has shown that these traditional medicines are not effective at all.

## What we can do

- **Do not purchase seahorse products.** This includes traditional medicine, food products, and souvenir items.
- **Do not buy seahorses for aquariums.** They do not like aquarium environments and often do not survive. It is better to leave them in their natural habitat so they can also serve their ecosystem role.
- 
- **Do not pollute the sea.** Pollution easily affects the habitat of the seahorse especially the fragile seagrass and coral environments.





*"Seahorse" by Alex Griffioen (CC BY 2.0)*

## **Laws that protect seahorses in the CT3**

### ***Indonesia***

- [Convention on International Trade in Endangered Species of Wild Fauna and Flora \(CITES\)](#)
- [Indonesia ratified CITES into a Presidential Decree \(No. 43/1978\)](#)

### ***Malaysia***

- [Convention on International Trade in Endangered Species of Wild Fauna and Flora \(CITES\)](#)
- [International Trade in Endangered Species Act of 2008](#)

### ***Philippines***

- [Convention on International Trade in Endangered Species of Wild Fauna and Flora \(CITES\)](#)
- [Wildlife Resources Conservation and Protect Act \(RA 9147\)](#)

## Resources

- [Read the online feature.](#)
- [Download the minigraphics.](#)
- [Download the Treasures of the Coral Triangle Module.](#)

## Quiz

**Seahorse pregnancy is very unique. How is it different from most pregnancies?**

**Dive into #marinemadness!  
Get to know the treasures  
of the #CoralTriangle!**

