



**iSeahorse**

Saving seahorses together

# Trends Toolkit

*Finding and surveying wild seahorse populations in support of conservation*

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A white line-art illustration of a seahorse swimming to the left, positioned on the left side of the blue header banner.

## INTRODUCTION

# What is iSeahorse?

*iSeahorse is a tool for seahorse science and conservation.*

iSeahorse harnesses the power of “citizen scientists” — anyone, anywhere in the world who sees a seahorse in the wild — to improve our understanding of these animals and protect them from overfishing and other threats.

### Who can help?

Anyone who sees a seahorse in the wild, including divers, photographers, scientists, and other nature lovers. You don't need to be a scuba diver to monitor seahorses; it is possible to find and count seahorses while snorkeling or walking along the shore at low tide as well.

### How can I help?

Start by uploading your photos and sighting information to [www.iSeahorse.org](http://www.iSeahorse.org). If you would like to do more, consider participating in iSeahorse Trends.

### What is iSeahorse Trends?

More than seahorse sightings, we want to find out if seahorse populations are declining, increasing, or staying stable through time, to monitor seahorse population trends.

### What happens to the data I share?

Your sightings information provides valuable data on the geographic distribution of seahorses. This information can be used to map data-deficient seahorse populations. Trends data help to identify seahorse populations that are in need of further research and conservation management, and allow policymakers and managers to set priorities based on scientific information rather than anecdotal observations. By sharing results, plus collaborating with and supporting local groups, we can all work to improve the fate of seahorses while engaging more people in ocean conservation.

## How your data will be used

As a citizen scientist, you will be making an important contribution to the conservation of seahorses and their habitats! Your data will be entered into the global database hosted at [www.iSeahorse.org](http://www.iSeahorse.org), together with data from other monitoring groups around the world. Following seahorse populations through time will enable researchers to track population status, reveal potential impacts from human activities and discover new aspects of seahorse biology. This information will be compiled and released to the relevant authorities and influence direct conservation action.

## How you can use your data

We also encourage you to use the data you collect for taking conservation action, especially if you notice any critical trends such as declining seahorse populations. There are many ways to be an advocate for seahorses in your area. You can start a petition, contact your local politician, or send a note to your local newspaper or broadcaster. See [www.iseahorse.org/action](http://www.iseahorse.org/action) and check out the FAQs (page 12) for some suggestions. In the coming months we will be adding a toolkit for taking conservation action and supporting features to iSeahorse.org, so please stay tuned.

## Terms and Conditions

Please see [www.iseahorse.org/terms-conditions](http://www.iseahorse.org/terms-conditions) for the terms and conditions of your participation in iSeahorse.



## INTRODUCTION

# About this toolkit

*This toolkit will guide you in conducting long-term monitoring of seahorse populations by surveying seahorses in their marine habitats, underwater.*

A standard method followed by all survey groups means that data can be compared across different locations through time.

### Check for new versions regularly

This toolkit and supporting material are living documents (continually updated) so **please check for new versions regularly** at [www.iseahorse.org/trends-underwater](http://www.iseahorse.org/trends-underwater), and contact us with any suggestions for improvement. We want to hear from you ([iseahorse@projectseahorse.org](mailto:iseahorse@projectseahorse.org)).



Photo: Shedd Aquarium/Brenna Hernandez

## INTRODUCTION

*Why seahorses?*

Photo: Shedd Aquarium/Brenna Hernandez

Seahorses (*Hippocampus spp.*) are unusual, funny-looking fishes that live in a variety of important marine habitats, which include seagrass beds, kelp beds, mangroves, estuaries and coral reefs. Unlike most other fishes, seahorses move slowly, have small home ranges and typically mate for life, and so are likely to be affected by habitat disturbances and overfishing. Seahorses are heavily traded around the world for traditional medicine (especially traditional Chinese medicine), curios and aquaria displays. Most seahorses are caught as bycatch by trawlers in the tropics that drag large nets along the ocean floor catching shrimp and fishes but also everything else in their path.

Despite their vulnerability, we do not know the full extent to which human activities impact wild seahorse populations. Currently, many seahorse species are considered “threatened” or “data deficient” on the International Union for Conservation of Nature Red List (IUCN, [www.redlist.org](http://www.redlist.org)), and all seahorse species are listed on Appendix II of the Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES, [www.cites.org](http://www.cites.org)).

Seahorse populations need to be preserved for ecological, biological, economic, and medical reasons. These fishes are important predators on bottom-dwelling organisms; removing them may disrupt ecosystems. Their extraordinary life

history — only the male becomes pregnant and pairs are monogamous in many species — provides us with an unusual opportunity to expand our understanding of reproductive ecology.

Subsistence fishers in some nations make a substantial portion of their annual income catching seahorses, and that dependence could increase as other fisheries decline. Many forms of traditional medicine employ seahorses to treat a range of conditions and ailments.

Seahorses are flagship species, charismatic symbols of the various ecosystems where they make their homes. Protecting seahorses means protecting these diverse habitats and all of the marine life that lives therein.

See [www.iseahorse.org/essential-facts](http://www.iseahorse.org/essential-facts) for more about seahorses!



## INTRODUCTION

# Why seahorses?

### Respectful interactions with seahorses

- **When you see a seahorse, do not touch it!**  
This damages the protective mucus on the seahorse's skin that prevents bacterial infections and other diseases.
- **Don't stir up silt with your feet or fins.**  
This makes it hard to find seahorses and you may injure animals with your feet. If you're walking, always watch where you step.
- **Limit the number of photographs**  
taken per seahorse per dive. Refer to the Project AWARE Guidelines for underwater photography. <http://www.projectaware.org/sites/default/files/Ten%20Tips%20for%20Underwater%20Photographers.pdf>
- **No seahorses should be moved or encouraged to move, ever.** It is common to find them lying motionless on the seafloor. Leave them be.

Question about interacting with seahorses? See our FAQ section for more.



Photo: Shedd Aquarium/Brenna Hernandez



## GETTING STARTED Registration

### Participant Registration

**Before you start**, email [iseahorse@projectseahorse.org](mailto:iseahorse@projectseahorse.org) to register as a surveyor. Include your name, contact information and location of proposed surveys. If you are part of a survey team, remember to include your team name and specify if you are the team leader.

### Get to know your seahorses!

Go to the Seahorse Identification Guide at [www.iseahorse.org/id-guide](http://www.iseahorse.org/id-guide) to familiarize yourself with seahorse features and the seahorse species in your area before you start any surveys. Be sure to practice your seahorse identification skills as much as possible!



Photos: Shedd Aquarium/Brenna Hernandez

## GETTING STARTED

## Starting a new survey site

## Decide on where to look

Here are some suggestions for choosing potential sites in your area:

- **Check out iSeahorse Sightings!** ([www.iseahorse.org/explore](http://www.iseahorse.org/explore)) iSeahorse users are already recording their seahorse sightings online. You can zoom in on the interactive map to see where seahorses are commonly spotted.
- **Getting clues from the internet:** Lots of people photograph seahorses. You can search for seahorse photographs from your general area, e.g., using Flickr or Google Images, to see if these were taken at any particular site. Do take note of the year the photos were taken, as a more recent sighting could offer a higher chance of spotting the seahorse again.
- **Look for good seahorse habitats:** Seahorses can be found in marine habitats such as coral reefs, seagrass beds, mangrove forests and seaweed beds (Figure 1). Remember to also look in rocky or muddy bottoms, oyster beds, at the base of piers, or on discarded fishing nets. Ask around about marine habitats, or look up potential sites online. Google Maps/Earth is a great tool for this.
- **Gather local information:** Ask local fishers, boaters, divers, dive shops, conservation groups and/or people who frequent the area about if and where they have seen seahorses.
- **Gathering information from fishing activities:** Visit your local fishing port or fish landing site to see if fishers are catching seahorses. You can then ask them about where those seahorses were caught.

## Fill out a “Underwater Site Datasheet” (Appendix A)

Once you have decided on a survey site, fill in what you know about the site on this sheet.

## Do a survey run!

See “Conducting seahorse surveys,” below, for instructions.

*You may not find any seahorses at your site during your initial searches.*

Report this information too. It is useful for us to know where seahorses are not found. Also do not be discouraged. Seahorses could be living in the area even if you did not find any on your first visit. Do try and survey the area again.

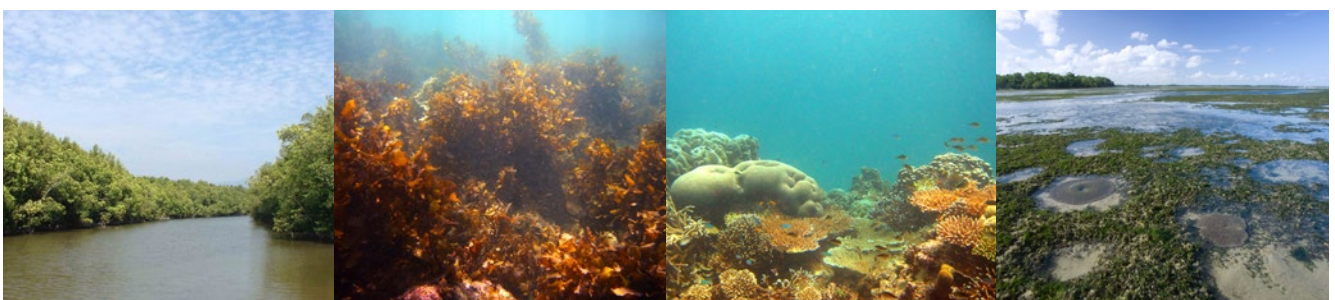


Figure 1. From left to right: mangrove forest, seaweed, coral reef, and seagrass bed. Photos by Tse-Lynn Loh, Ria Tan/Wild Singapore, Jeffrey Low.



## GETTING STARTED

# Existing survey sites

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### Check for existing survey sites

Before you create a new site, you should see if there are existing iSeahorse survey initiatives or sites in your area. The most valuable information comes from repeat surveys of the same sites, even if you sometimes don't find seahorses.

- **To find an existing site**

Email [iseahorse@projectseahorse.org](mailto:iseahorse@projectseahorse.org) to check for sites near you and the survey teams or surveyors who assessed those sites.

- **Ask online**

You can ask about possible survey sites online by commenting on the iSeahorse website at [www.iseahorse.org](http://www.iseahorse.org).

- **Get in touch**

Contact the survey team leader to see if you can help.

- **Review and submit changes**

Review the “Underwater Site Datasheet” for the site at the start of each survey to see if anything has changed from the previous surveys. Submit any changes to iSeahorse.

### Seahorse survey practice

We encourage you to carry out a few practice surveys in order to develop an eye for finding seahorses underwater, as well as to get comfortable with the survey protocol, handling the survey gear and recording data. If you do spot a seahorse during a practice run, log your sighting on [www.iSeahorse.org](http://www.iSeahorse.org)!

## CONDUCTING SEAHORSE SURVEYS

### Basics

#### How often should I survey seahorses?

This is really up to you. Monthly surveys provide seasonal information, for example finding out when seahorses reproduce, or if they move somewhere else during the rainy season. That said, we know volunteers have time constraints, and the weather may not always cooperate (ex, monsoons). Data collected every six months are still very useful; so are those collected just once a year — but preferably at the same time every year.

#### What you will need for your survey

At the most basic level, you can swim a survey site and record the number of seahorses. However, if you can take a datasheet and some simple tools with you, you will add valuable information to the survey.

##### Highly Recommended

- Clipboard or underwater slate with attached pencil
- Survey datasheet (download from [www.iseahorse.org/trends-underwater](http://www.iseahorse.org/trends-underwater))
- A ruler (can be attached to the clipboard)
- Laminated Seahorse Survey Guide (Appendix C or download from [www.iseahorse.org/trends-underwater](http://www.iseahorse.org/trends-underwater))
- Laminated Seahorse ID Guide (Southeast Asian species, Appendix D or download from [www.iseahorse.org/trends-underwater](http://www.iseahorse.org/trends-underwater))

##### Optional, but very useful

- Waterproof camera
- Handheld GPS, or GPS-enabled device
- Stopwatch
- Compass

#### Staying safe during surveys

Data are important, but safety is first. Watch out for weather conditions and your fatigue levels. Scuba divers should follow all safe-diving guidelines and protocols laid out by their training organization (PADI, SSI, CMAS, etc.) according to their skill level.

#### Sending data to iSeahorse

You can download a spreadsheet for entering your data from [www.iseahorse.org/trends-underwater](http://www.iseahorse.org/trends-underwater). Complete it as best you can and email it to [iseahorse@projectseahorse.org](mailto:iseahorse@projectseahorse.org).

If you are starting surveys at a new landing site or if something has changed at your site, submit an **Underwater Site Datasheet** as well, also available at [www.iseahorse.org/trends-underwater](http://www.iseahorse.org/trends-underwater).

## CONDUCTING SEAHORSE SURVEYS

### Measuring survey “effort”

It is important for us to know the “effort” you have expended in finding seahorses so we can compare results through time and space. For example, seahorses are more common at a site where five individuals were seen after 100 meters of swimming vs. five in 300 meters. Make sure you always include your effort in your data submission. But if you can’t measure survey effort, your information is still useful! Just enter it into iSeahorse sightings at [www.iSeahorse.org](http://www.iSeahorse.org).

*You can measure effort in two ways – the **distance traveled** and the **total time spent** actively searching for seahorses.*

### Distance traveled

“Distance Traveled” is simply the distance you have covered while searching for seahorses. You do not have to swim in a straight line; swimming in a curve, or a series of zigzags is fine as long as you can estimate the distance traveled. Also try not to backtrack over area you’ve already searched. However, unless you have a GPS tracking your movements, a straight line distance is the easiest to estimate.

Here are a few suggestions for how you can measure or estimate your distance traveled. Maybe you have more ideas!

- **Bring an actual measuring tape or a rope with marked sections with you.** Attach it to a nonliving anchor point (such as a pier piling or dead coral) and reel it out as you search. Take note of the distance when you stop. Don’t forget to reel back the tape or rope!
- **Take GPS coordinates at your start and end points.** If you are snorkeling or walking at low tide, you can tow (in a waterproof bag) or carry the GPS unit with you as it tracks your movement. If you have a GPS-enabled camera, you can take photographs of your start and end points and extract the coordinates later.
- If you don’t own a GPS, **take note of the start and end points relative to prominent landmarks on shore, or fixed points on the water, such as mooring buoys.** You can then calculate the distance between start and end points from Google Maps or Google Earth.
- **Counting fin kick cycles** is also an effective way to estimate distance while diving. Start by counting fin kicks along a known distance a few times to get a reliable measure of the distance traveled in a single kick cycle. One buddy can count fin kicks during the dive while the other diver searches for seahorses. Then calculate the total distance swum based on the number of fin kicks at the end of the dive.

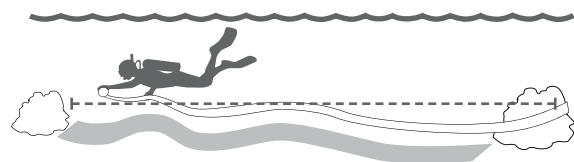
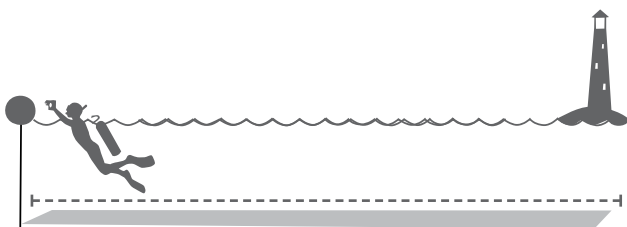


Figure 2. Measuring distance traveled: Take GPS coordinates (left) or use a measuring tape (right) to find the distance between start and end points.

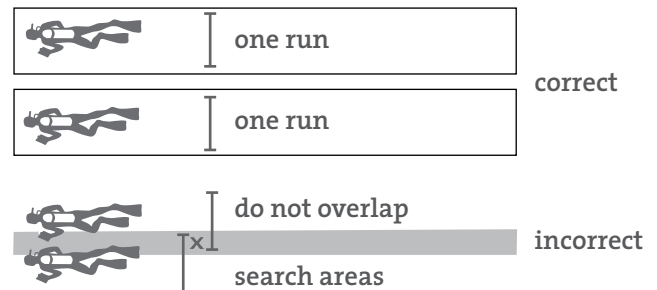
### Active search time

“Active search time” is simply the time you spent searching for seahorses. You can record the actual time you spent searching for seahorses using a stopwatch. Note that if you stop to take a photograph, or just look around, you should stop your watch and then restart it when you look for seahorses again. As always, do your best to be rigorous.

## CONDUCTING SEAHORSE SURVEYS

### Starting Seahorse Surveys

Each swim, or walk, in which you record start and end points and look for seahorses is considered one survey “run.” You can do as many or as few runs as you like per site, just complete a separate datasheet for each run. For a site with multiple runs, ensure that the runs do not overlap so that an area is not searched twice within the same survey period (which could lead to double-counting). Keep runs at least 1 meter apart to avoid overlapping search areas. Communicate with your buddy and avoid double-counting seahorses!



The survey datasheet (Appendix B) can be printed on waterproof paper, or copied onto your slate.

### Completing the survey datasheet for each run

- Take the **GPS coordinates** of your starting point, or mark it on a map as accurately as possible.
- Which **marine habitat** (coral reef, mangrove, seagrass, seaweed, muddy bottom, etc.) are you searching in? Take a photograph of the general habitat at the start and end of your run and submit it with your survey data.
- Record the name of the **nearest human population center** (village, town, city).
- Take note of **time and depth** at both the start and end of the run.
- Record **compass bearing** of the direction you will travel for your run (or your best estimate).
- **Search method:** Are you scuba diving, snorkeling or walking?
- **Go slowly** and search carefully! Seahorses can hide in crevices, under overhangs, in caves and between rubble pieces. They can also be heavily covered with sediment and algae, blending into the background (Figure 4).
- This information is **optional**, but very useful.:
  - For seagrass, mangrove and seaweed habitats, what is the dominant vegetation type and overall cover? E.g., short vs. tall seagrass (Figure 3), mangrove trees with prop roots vs. pencil roots, kelp beds vs. fine, “grassy” seaweed. <http://mangrove.nus.edu.sg/guidebooks/text/1043.htm>
  - For a coral reef, provide a rough estimate of the overall cover of live hard coral.
- Start your stopwatch, and start looking for seahorses!



**Figure 3.** Examples of (a) short seagrass (*Halophila ovalis*) and (b) long seagrass (*Cymodocea rotundata*). Photos by Ria Tan/Wild Singapore.



**Figure 4.** A heavily sedimented seahorse (*H. comes*) blending into the background. The seahorse’s tail is curled around a holdfast of brown seaweed. Photo by Jeffrey Low.

## CONDUCTING SEAHORSE SURVEYS

# Collecting data for the seahorse survey

## I found a seahorse! Now what?

Success, you've found a seahorse! Please DO NOT touch or handle the seahorse to avoid stressing it. Record data for each seahorse that you encounter, such as **species**, **depth** and **holdfast** on the survey datasheet (Appendix B). There may be more than one species of seahorses at your site. The holdfast is the object that the seahorse's tail is curled around. It could be a piece of rubble, seaweed (Figure 4), sponge, seagrass blade, or man-made object such as a fishing net.

### 1. Measure torso length

Place your ruler or a grid behind the seahorse to measure **torso length** (see Figure 5).

- **Torso length** is the distance between the top of coronet and the base of the dorsal fin. Record to the nearest 0.5 cm.
- Or measure torso length from a **photo** of the seahorse with a scale or grid (see point 3, next page).
- If you are unable to measure the seahorse, e.g., the seahorse is hiding in a narrow crevice or within branching coral, DO NOT damage the habitat to try and reach the seahorse! Give your best **estimate** of torso length (look at your ruler for reference), and indicate that you were unable to directly measure torso length in the "Remarks" column of the datasheet.

### 2. Record the sex of the seahorse

- **Male seahorses** have a brood pouch under the belly (Figure 5). Sometimes, the pouch is not apparent but the male belly meets the tail at a tapered angle and extends beyond the base of the dorsal fin.
- **Female seahorses** do not have brood pouches. The belly of the female meets the tail at a right angle and ends level with the base of the dorsal fin.
- In **juvenile** (young) seahorses, the brood pouch may not be apparent. If you are not sure, record sex as "unknown"
- If the seahorse is male, record whether he is **pregnant** (swollen brood pouch) or not (Figure 6).

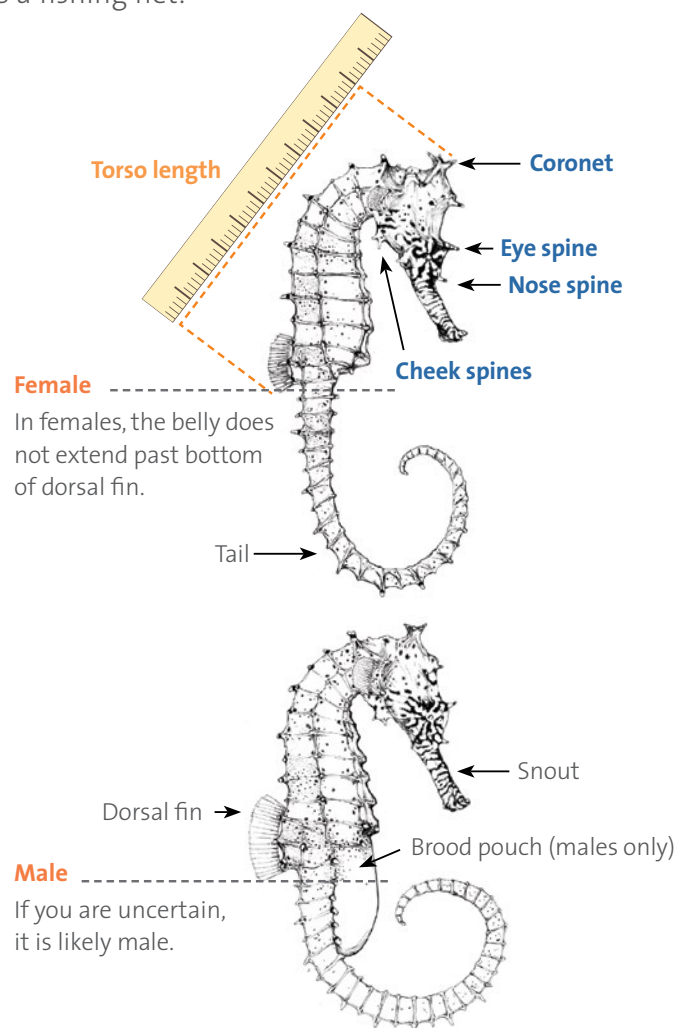


Figure 5. Side views of female and male seahorses.



Figure 6. Very pregnant male seahorse (*H. comes*) with a swollen brood pouch. Even if the brood pouch is slightly bloated, the seahorse is probably pregnant. Holdfast: sponge. Photo by Ria Tan/www.WildSingapore.com

## CONDUCTING SEAHORSE SURVEYS

### Collecting data for the seahorse survey

#### 3. Take a photo

Finally, take a **photo** of the side profile of the seahorse with your ruler if you can (Figure 7). Make sure the facial spines and the coronet can be clearly seen in the photo. Record the photograph number on your datasheet.



Figure 7. Photo of side profile of female seahorse (*H. comes*) with a ruler. Photo by Tse-Lynn Loh.

*Repeat the above 3 steps for every seahorse you encounter along the run.*

#### At the end of your survey

If you are using an erasable slate, take a photograph of your slate before cleaning it for the next run. It's a good habit to store your data so that you can check for errors later.

#### What if I didn't find any seahorses?

Your data are still very useful! Zeroes are important in a survey too. It is useful for us to know where seahorses do not live as well as where they do live. The habitat type, location, depth and condition of the seabed are important for understanding seahorse habitats within the context of your area. Submit your datasheet even if no seahorses were found in your survey. You can also try again at the same site, or come back to the site at another time, because seahorses are well-camouflaged and might take a few tries to find, or may not be there now but could appear in a different season. Alternatively, you could search another site.

## CONDUCTING SEAHORSE SURVEYS

### Unknown seahorse species

#### What if I don't know the seahorse species?

Your data are still important! Record “Unknown” on your datasheet for species, and be sure to take at least two good photographs of the seahorse.

- Photo of the side profile of the seahorse with a ruler. Include the entire head and dorsal fin, so torso length can be measured (Figure 7).
- A close-up of the side profile of the head, with clearly visible facial spines (especially cheek spines) and coronet (Figure 8).

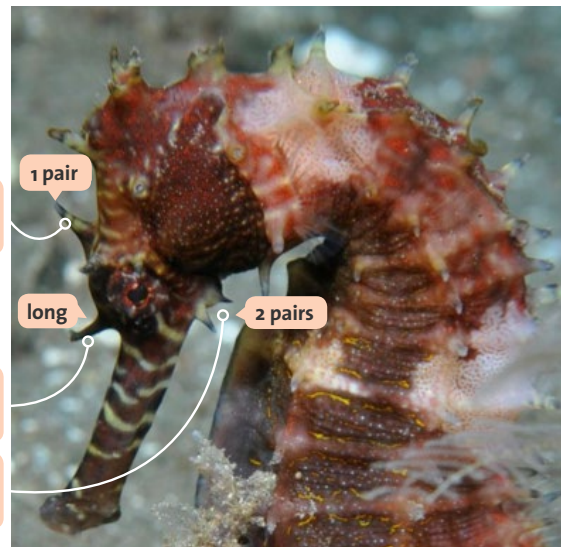
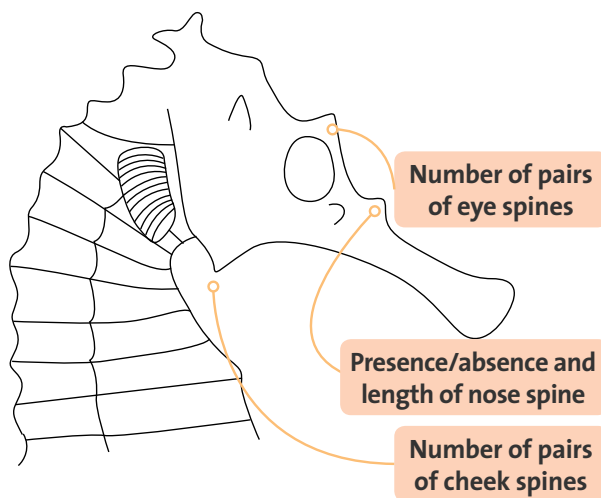


Figure 8. Close-up of side profile of seahorse head (*H. barbouri*). Note that the facial spines and coronet are clearly visible. Photo by Theophile Peeters/GuyLian Seahorses of the World 2012.

#### No camera?

If you do not have a camera, record as many of the following characteristics as you can:

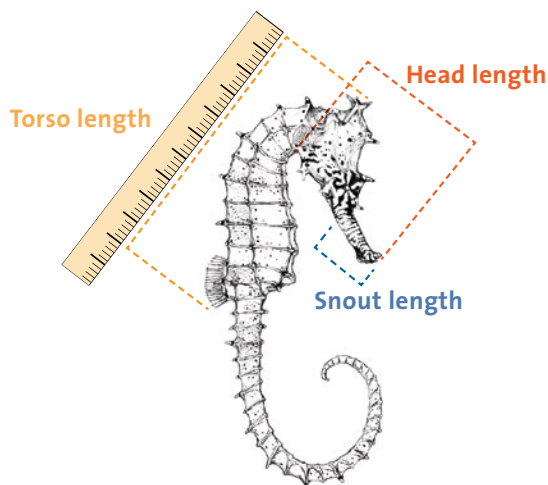


Figure 9. How to measure head length, torso length, and snout length.

- Torso length (Figure 9)
- Head length (Figure 9)
- Snout length (Figure 9)
- Number of pairs of cheek spines (Figure 8)
- Number of pairs of eye spines (Figure 8)
- Presence/absence of nose spine, whether it is long (prominent) or short (low) (Figure 8)
- Any other distinguishing features, e.g., spines or bumps on body, stripes on snout/tail

**But remember — DO NOT move the seahorse to make the measurements!**

Send the photos and/or information on characteristics to us, and we can help you identify your seahorses [iseahorse@projectseahorse.org](mailto:iseahorse@projectseahorse.org).



## FAQ

### General Questions

#### Who can join seahorse surveys?

Anyone can join the seahorse surveys. Anyone who sees seahorses in the wild, including divers, photographers, scientists and other nature lovers, can use this toolkit to survey seahorses and track their population trends through time.

#### If I can't swim, can I still survey seahorses?

You don't even need to swim as you can survey seahorses found in intertidal coastal areas such as rock pools during low tides.

#### What are the main threats to seahorses?

As with many other fish species, seahorses face threats on many different fronts—almost all from human activities.

- Many are targeted by fishers for use in traditional medicines, tonic foods, souvenirs and the live ornamental aquarium trade.
- The majority are caught in nonselective fishing gear, predominantly in trawls. Many of these seahorses get used for traditional medicines, tonic foods and souvenirs.
- Habitat degradation and loss, e.g., from fishing gear, coastal development and pollution.

#### I found a seahorse/took a photo of a seahorse on a dive/snorkel/walk. What do I do?

Congrats! Seahorses are not easy to find, so well done! In addition to seahorse surveys, we collect information on seahorse sightings. It is very useful to know where seahorses occur. Do register on [www.iSeahorse.org](http://www.iSeahorse.org) and log your sighting and/or upload your seahorse photo.

### Survey protocol

#### How do I join a seahorse survey?

Start by registering with iSeahorse! You may elect to join an existing survey team or carry out surveys on your own. Check with the iSeahorse coordinator at [iseahorse@projectseahorse.org](mailto:iseahorse@projectseahorse.org) about existing survey sites before registering a new site to avoid duplication of effort.

#### Do you offer training workshops for seahorse surveys?

Yes, we will offer hands-on training periodically. Check [www.iseahorse.org/trends-underwater](http://www.iseahorse.org/trends-underwater) for the next available workshop and location. Training materials can also be found at that website.

#### I'm not sure about my seahorse ID, what should I do during the survey?

It is important for us to keep accurate records from the surveys. If you're unsure of the seahorse species, put "unknown" in the species box and upload photos of the seahorse. Also see the section on "Unknown seahorse species" for the list of characteristics that will help you identify the seahorse later. You may put the suspected species name in the Remarks section of the survey datasheet.



## FAQ

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### **Is there a minimum distance or time I have to search for the survey?**

No, any data you can contribute will help a lot! Of course the more distance you cover, and the more time you spend searching, the higher your chance of finding seahorses. If you find one seahorse, look hard in the surrounding area. Seahorses tend to be patchy, and chances are, there is at least one more (if not a group of them) nearby.

### **I've found a site with lots of seahorses, and would like to do more rigorous surveys. What should I do?**

Wonderful! We're happy to help you set up a more detailed survey program. Please get in touch by emailing [iseahorse@projectseahorse.org](mailto:iseahorse@projectseahorse.org).

## **Seahorse and marine conservation**

*There are plenty of ways to make a difference for marine conservation as an individual.*

See [www.iseahorse.org/action](http://www.iseahorse.org/action) for ways you can help seahorses. This webpage is also a good starting point: <http://www.wildsingapore.com/vol/index.html>.

### **Now that I've completed a seahorse survey, what can I do with my data?**

We hope the survey data will provide the information you need to take direct conservation action to protect seahorses. Raise awareness through social media if you notice seahorse numbers declining over time, or if a seahorse population is threatened by human activities in the vicinity. You can also give feedback to the policymakers in your area by writing to them or calling them.

### **I can't find any seahorses. Does this mean seahorses are in trouble?**

Not necessarily. Seahorses are cryptic animals, typically well-camouflaged and usually hidden. They also tend to be sparsely distributed around an area. You may have to resurvey an area or cover more distance before you encounter a seahorse. However, if you know that the area used to have plenty of seahorses, either from anecdotal reports or personal experience, or if you had surveyed seahorses in the same run previously but you're not finding them currently, these could indicate a decline in the seahorse population.

### **I found a seahorse lying on the sea bottom. Is it hurt?**

Part of the seahorse defense is to lie motionless or "play dead" when they feel threatened. Seahorses frequently curl up in depressions on the seafloor as well. Chances are, the seahorse is trying to camouflage itself and will be active again once you move. It would be better not to touch or disturb the seahorse. If you do see an injured seahorse, leave it alone, it will be able to recover on its own.

### **I was walking along a pier and a fisher pulled up a seahorse in the net. Would this information be useful to iSeahorse?**

Yes, fishing and gleaning activities can provide information on where seahorses live as well. Politely ask if you could take a closer look at the seahorse and record information for iSeahorse Sightings (species, date, time, location, photograph). If the fisher is not keeping the seahorse, and it is still alive, try to encourage him/her to release the seahorse back into the water.



# Appendix A

Site Datasheet





# iSeahorse Trends

## Underwater Site Datasheet



### Basic information

Country

Province/State/Territory

Site name

GPS Coordinates (if known)

Nearest human population center (e.g. town, city)

Survey leader

Survey team name (if applicable, optional)

Survey team members (if applicable, optional)

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### Detailed information

Other location information (e.g. size of site, description of surroundings, etc) (optional):

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Any threats in the area (e.g. land development, agricultural or industrial runoff, etc)?(optional):

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Any conservation or management measures in the area (e.g. fishing restrictions, national parks, access restrictions, etc)? (optional):

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Area users (e.g. fishing, boating, diving, beach use etc) (optional):

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*Attach related files (optional): (e.g. dated photo of area, map of area, related publications, news articles, etc.)*



# Appendix B

Survey Datasheet







# Appendix C

Seahorse Survey Handout



# iSEAHORSE.ORG

## Seahorse Survey Handout

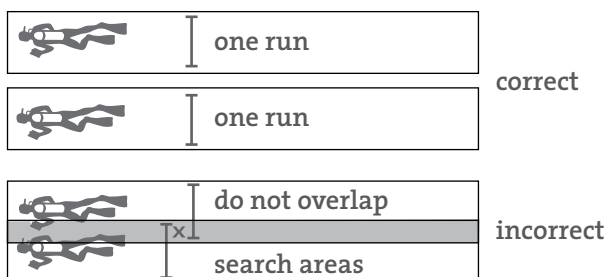
### Safety first

Sometimes it is not possible to complete the survey as you had planned, e.g., when the weather turns bad or nightfall is approaching. At these times, do not continue with the survey and leave the area!

**Some data are better than no data.**

### Starting surveys

- Each swim or walk in which you record start and end points and look for seahorses is considered one survey **run**. You can do more than one run per site; just **fill in a separate datasheet for each run**. Be sure that the runs do not overlap so that the same areas are not searched twice (i.e. double counting).



- Fill in the **site description** portion as completely as you can. Record your general observations, e.g., did you see anyone fishing? Is there pollution or construction work going on nearby?

### More than one surveyor?

If you have a dive buddy searching the same area, both of you have searched one run. Only fill in one datasheet.

### Reminder

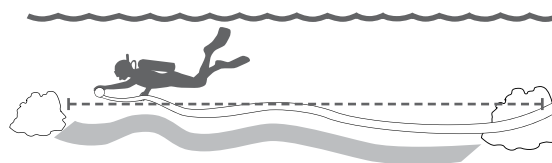
Seahorses are well-camouflaged and very difficult to spot in the field. You will need to practice looking for seahorses before starting to collect data. Go slowly and search the sea bottom thoroughly!



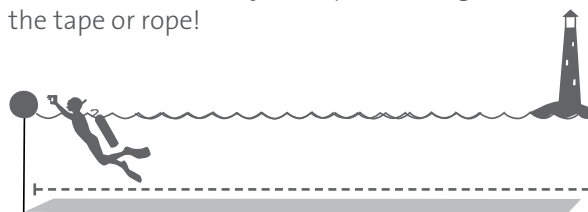
Photo: Jeffrey Low

### Measuring “effort”

Always include your **effort** expended in your data submission. Here we are using **distance traveled** and **active search time** while searching for seahorses as measures of effort. Here are a few suggestions for how you can measure distance traveled:



- Use an actual measuring tape or a rope with marked sections. Attach it to a nonliving anchor point (such as dead coral) and reel it out as you search. Take note of the distance when you stop. Don't forget to reel in the tape or rope!



- If you are snorkeling or walking at low tide, tow or carry a GPS unit with you as it tracks your movement.
- Take GPS coordinates at your start and end points.
- Make note of the start and end points relative to prominent landmarks on shore or fixed points on the water, such as mooring buoys. You can then extract the GPS coordinates from Google Maps or Google Earth and measure the distance between start and end points.

### Remember to bring

- Clipboard or underwater slate with attached pencil
- Survey datasheets
- Ruler or measuring grid
- Laminated Seahorse ID Guide
- Hand-held GPS\*
- Underwater camera\*
- Compass\*

\*Optional, but recommended

# iSEAHORSE.ORG

## Seahorse Survey Handout

### Recording seahorse data

- **Do not** touch or handle the seahorse to avoid stressing it.
- Refer to your Seahorse ID Guide to identify the seahorse species.
- Record all information requested on the datasheet for seahorses.
- Place your ruler behind the seahorse to measure **torso length** to nearest 0.5 cm. You can also photograph the side profile of the seahorse with a ruler to calculate torso length.
- Take a photo of the side profile of the seahorse alongside your ruler. Make sure the **facial spines** and the **coronet** are clearly visible in the photo.

Record the photograph number on your datasheet. Record data and take a photo for each seahorse you encounter.

### Sexing seahorses

**Male seahorses** have a brood pouch under the belly, so the belly meets the tail at a tapered angle and extends beyond the base of the dorsal fin. Male seahorses with a swollen brood pouch are **pregnant**.

**Female seahorses** do not have brood pouches. The belly of the female meets the tail at a right angle and does not extend past the base of the dorsal fin.

In juvenile (young) seahorses, the brood pouch may not be apparent. If you are not sure, record sex as **unknown**.

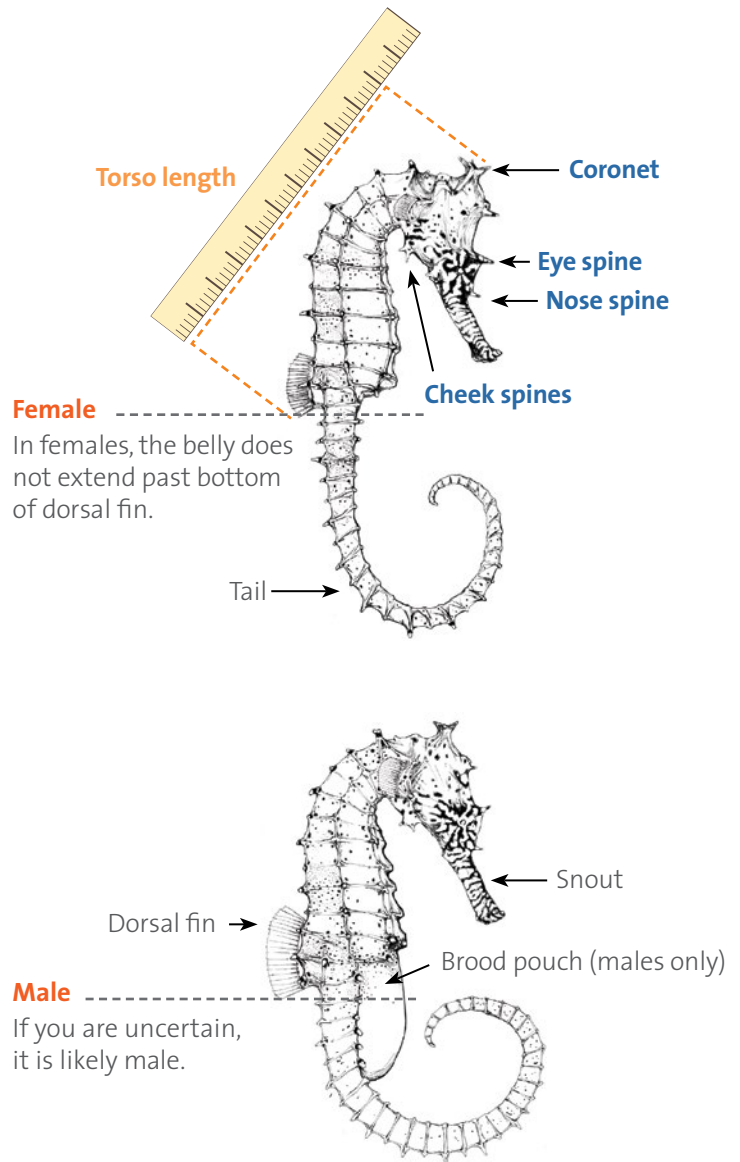
### Unknown seahorse species?

Mark **unknown** on your datasheet for species, and take at least two good photographs of the seahorse.

1. Photograph the side profile of the seahorse alongside a ruler. Include the entire upper torso so torso length can be measured.
2. Take a close-up of the side profile of the head, with clearly visible facial spines (especially cheek spines) and coronet.

### No seahorses?

Do submit your datasheet even if no seahorses were found in your run. It is useful for us to know where seahorses do not live as well as where they do live.



### Data upload

Don't forget to enter your data and submit your photos to [iSeahorse!](https://www.seahorse.org)



# Appendix D

Identification Guide for the Large Seahorses of Southeast Asia



# COMMON LARGE SEAHORSES of Southeast Asia

## Seahorses in Southeast Asia

Currently there are 14 recognized seahorse species in Southeast Asia. There are nine common large species, which can be broadly divided into two groups — “spiny” and “smooth.” Spiny seahorses have spines or spikes covering their bodies, while smooth seahorses do not. If your seahorse is not listed here, go to [www.iSeahorse.org](http://www.iSeahorse.org) for pictures and descriptions of other seahorse species.

## Masters of Disguise

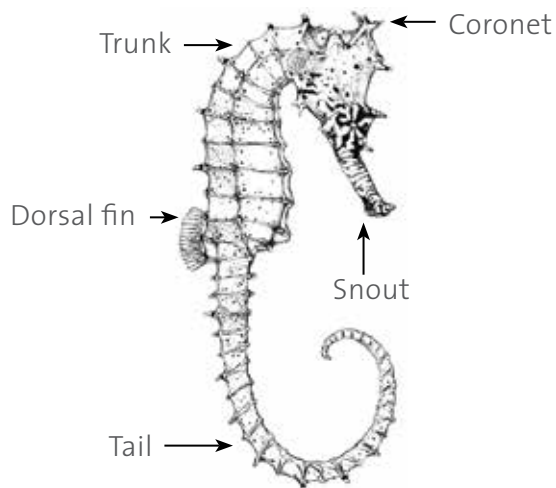
Seahorses are well-camouflaged, and individuals can be covered by seaweeds and sediments in the wild. **Color and lengths of skin filaments (“hairs”) can vary for individuals within the same species and so are NOT useful for identification.** Practice your identification skills before starting surveys.

## Is the seahorse smooth or spiny?



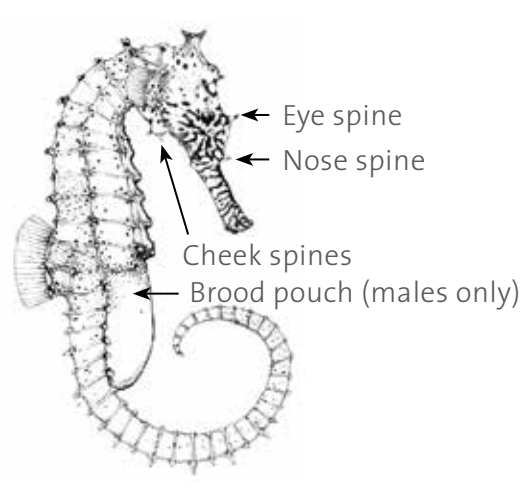
## Seahorse Parts

*Hippocampus barbouri*



### Female

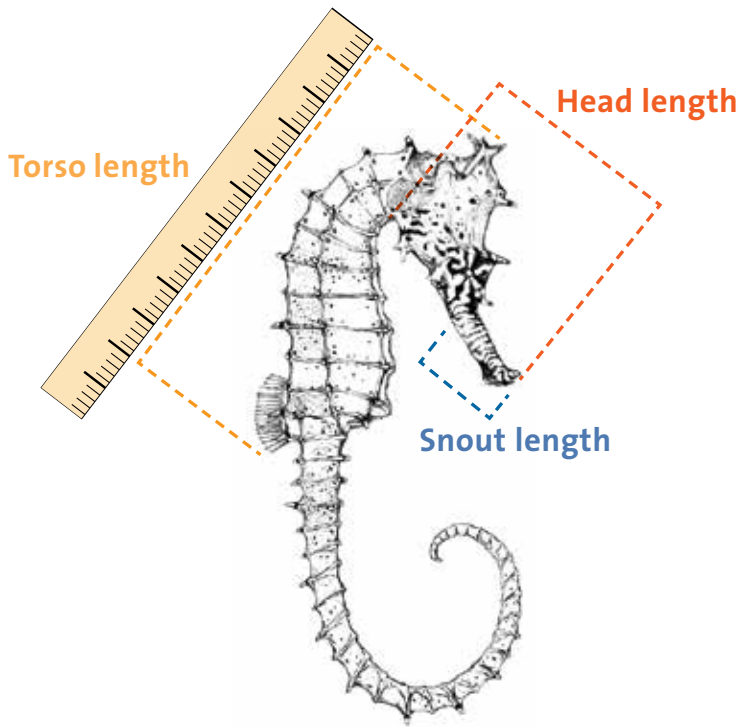
In females, the belly does not extend past the **bottom of the dorsal fin**. If you are uncertain, it is likely male.



### Male



# Don't Know Which Seahorse Species? How to Photograph for ID



For unknown species, record the following characteristics:

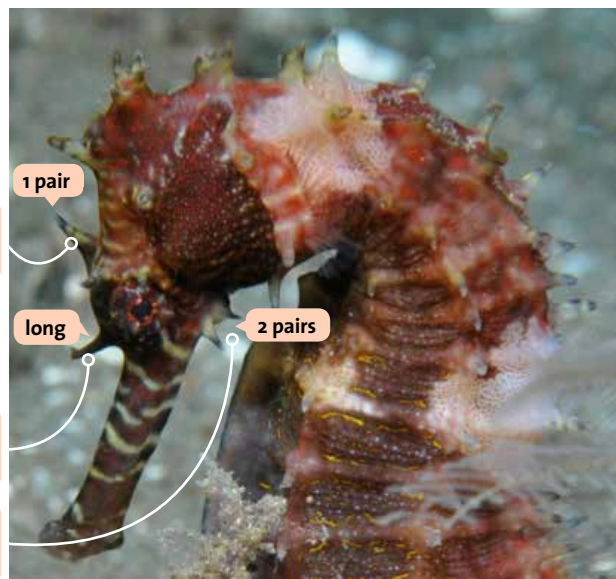
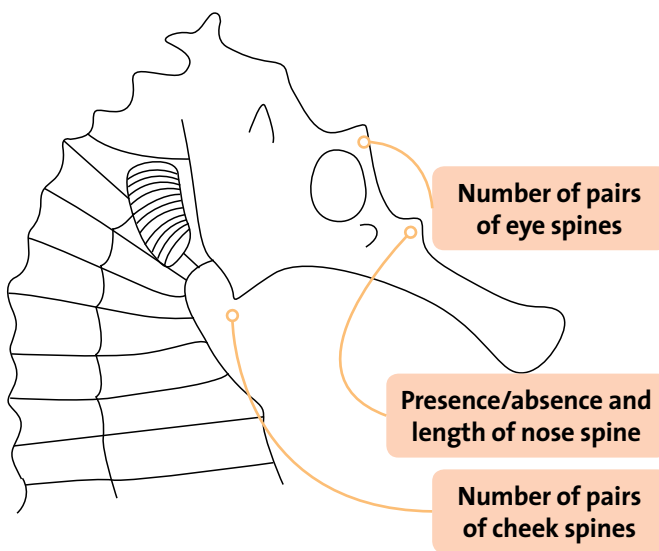
- **Torso length**  
(distance from top of coronet to base of dorsal fin)
- **Head length**  
(from immediately behind the operculum – the flap covering the gills – to tip of snout)
- **Snout length**  
(from bump immediately in front of the eye to tip of snout)

or

Take a photo of the side profile of the seahorse with a ruler and calculate these measurements from the photo.

## Also record and photograph a side view of the head showing

- All facial spines and coronet
- Number of pairs of cheek spines
- Number of pairs of eye spines
- Presence/absence of nose spine, and if present, whether it is long (prominent) or short (low)
- Any other distinguishing features, e.g., spines or bumps on body, stripes on snout/tail



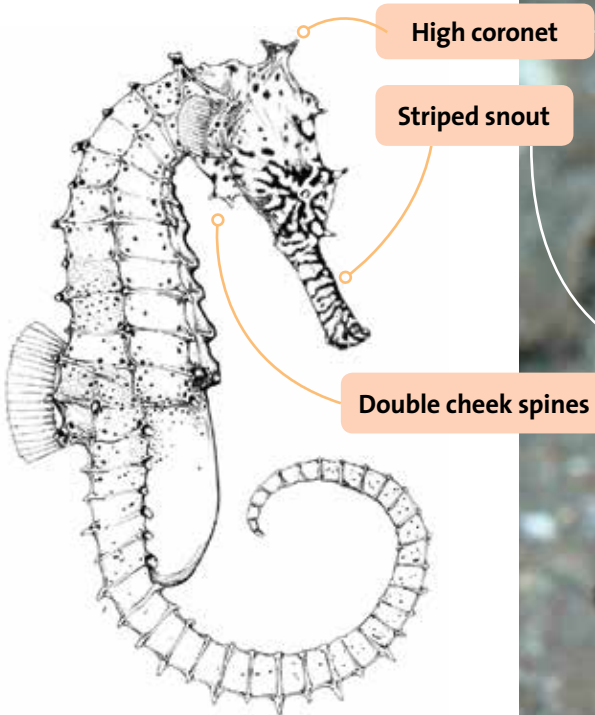
*H. barbouri*

Photo: Theophile Peeters

# BARBOUR'S SEAHORSES

## *Hippocampus barbouri*

- Two pairs of cheek spines
- Prominent nose spine
- Stripes on snout
- Spine in front of coronet



Color variation of *H. barbouri*.

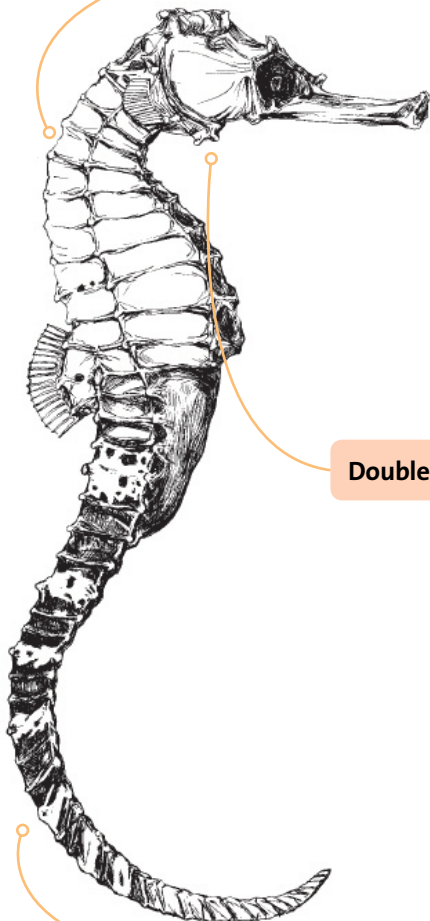


Photo: Shedd Aquarium/Brenna Hernandez

Photo: Theophile Peeters

# TIGER TAIL SEAHORSE

## *Hippocampus comes*



Blunt spines

Double cheek spines

Striped tail



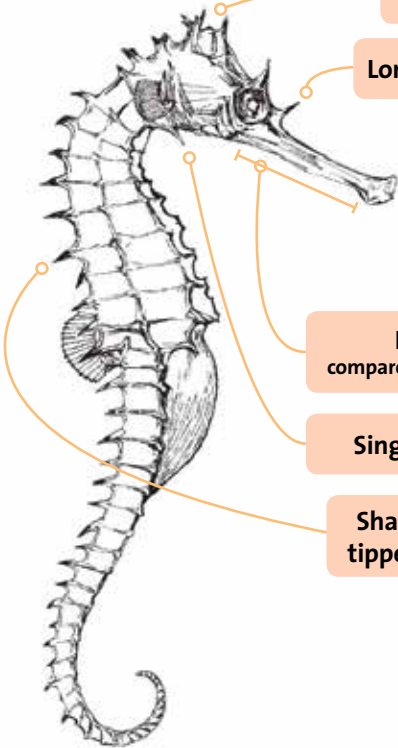
- Double cheek spines
- Prominent nose spine
- Rugged spines on body (spines not sharp)
- Low coronet
- Striped tail (can look blotchy)
- Small head relative to body

Photo: Antidio Rossi

# SPINY SEAHORSE

## *Hippocampus histrix*

- Long snout
- Single cheek spine
- Sharp spines on coronet
- Prominent nose spine
- Sharp body spines



Sharp spines on coronet

Long nose spine

Long snout compared to *H. spinosissimus*

Single cheek spine

Sharp, often dark-tipped body spines

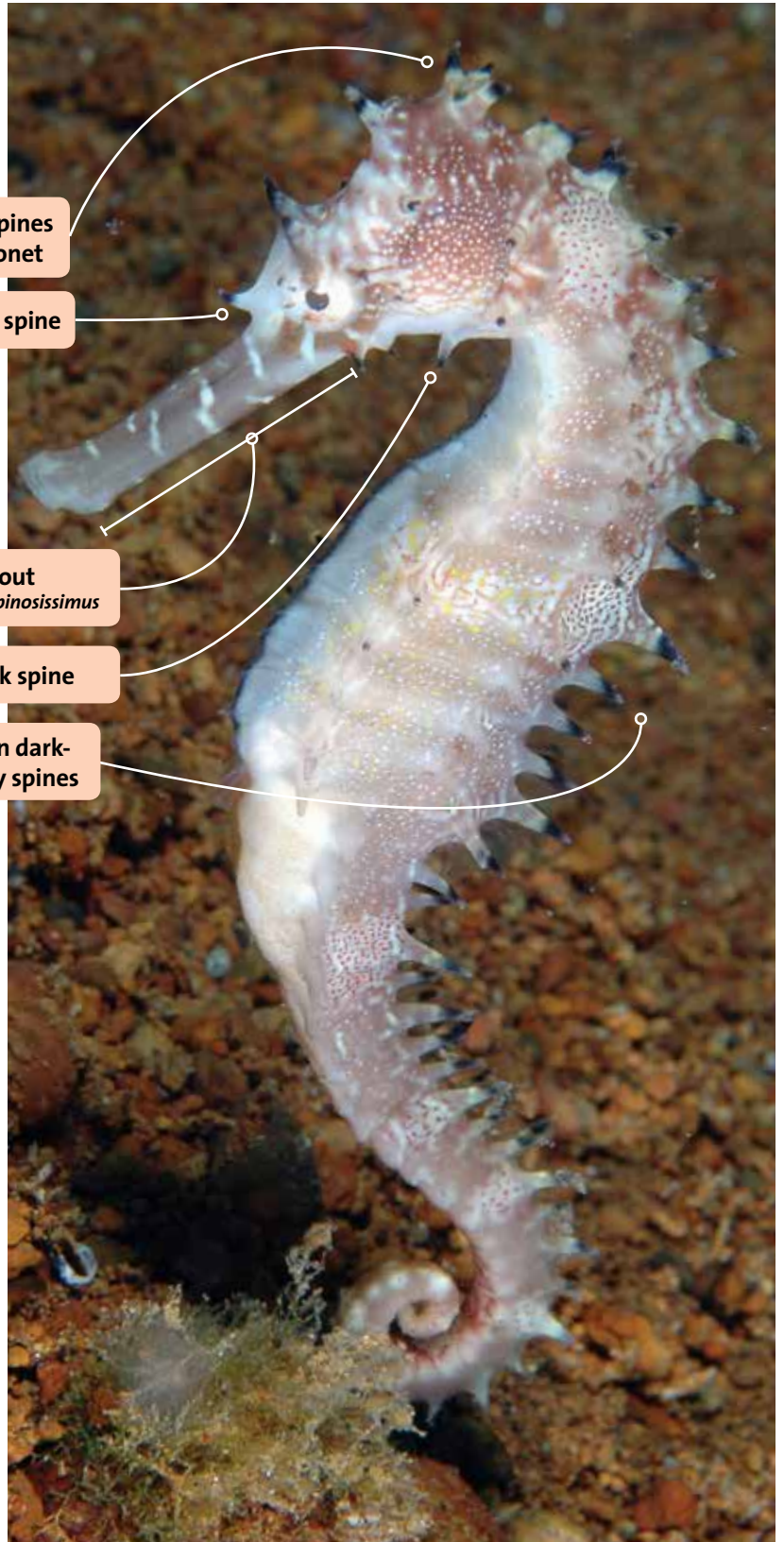
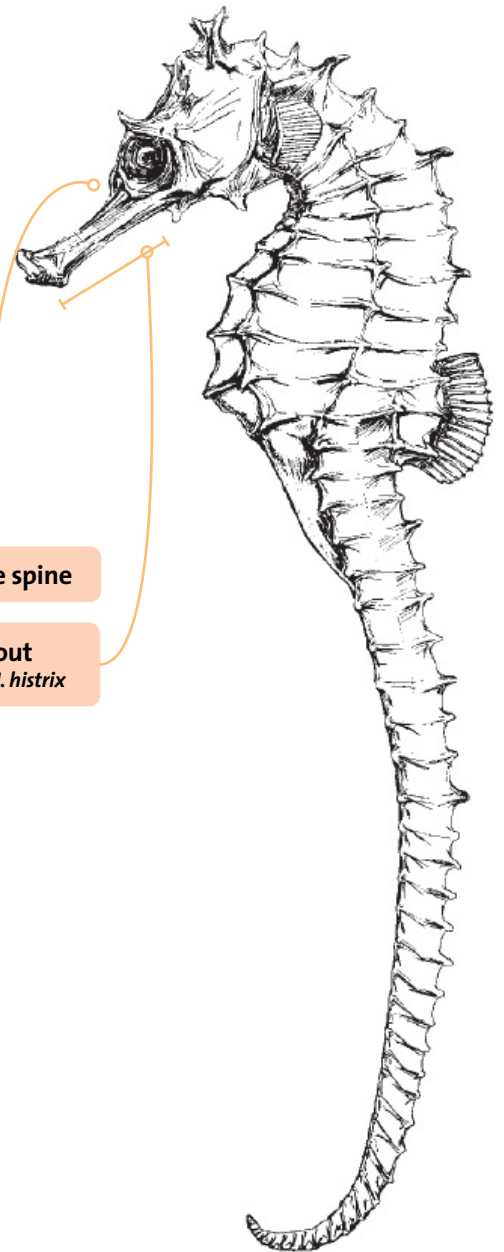


Photo: Roland Wantense

Photo: Jeffrey Low

# HEDGEHOG SEAHORSE

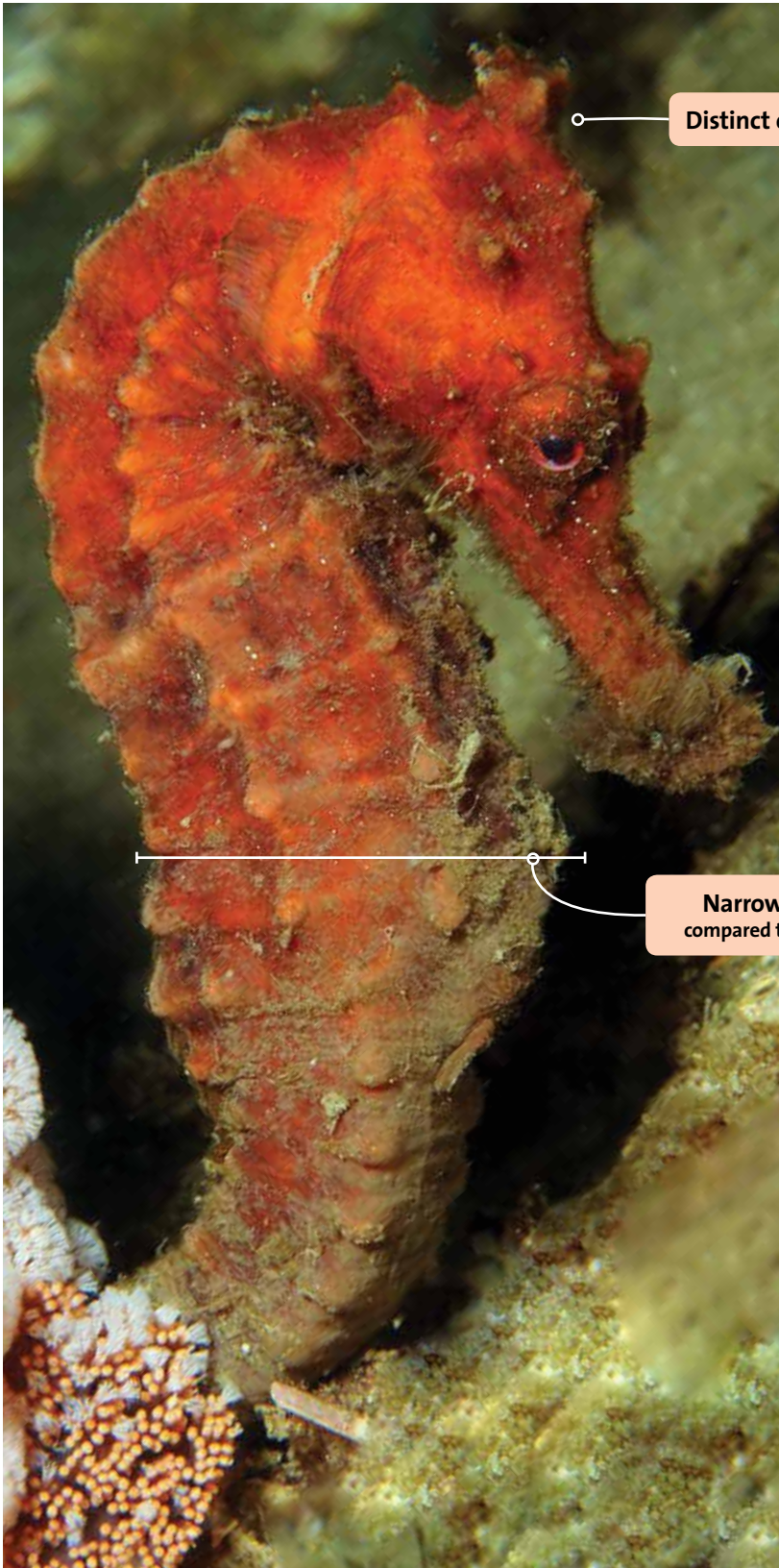
## *Hippocampus spinosissimus*



- Low or no nose spine (compare to *H. histrix*)
- Single or double cheek spines
- Blunter and shorter body spines than *H. histrix*

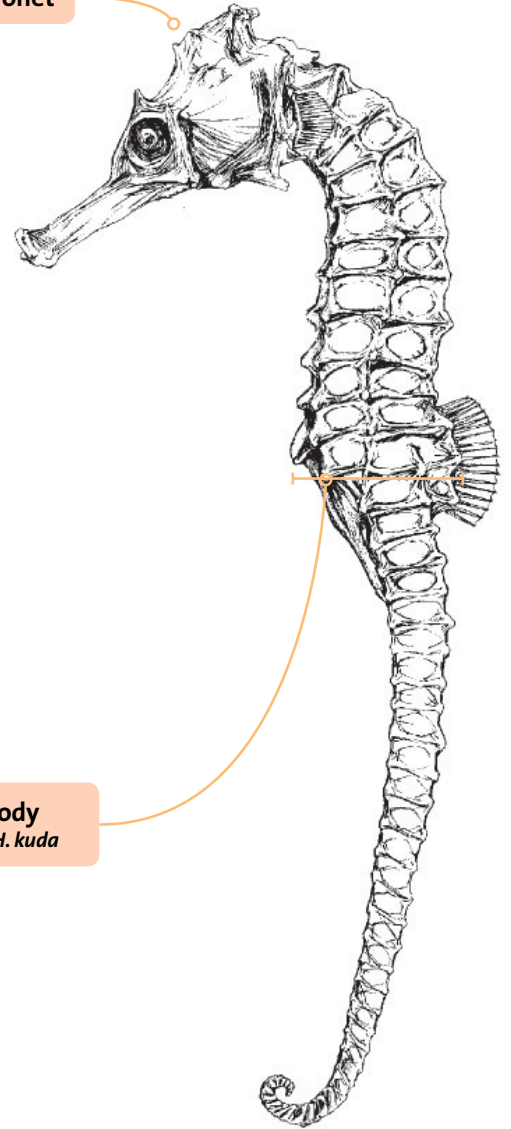
Photo: Shedd Aquarium/Brenna Hernandez

# KELLOGG'S SEAHORSE *Hippocampus kelloggi*



Distinct coronet

Narrow body  
compared to *H. kuda*

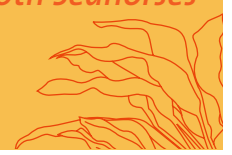


- Narrow body (compared to *H. kuda*)
- Thick trunk rings
- Distinct coronet
- Long, back-pointing, rounded cheek spine

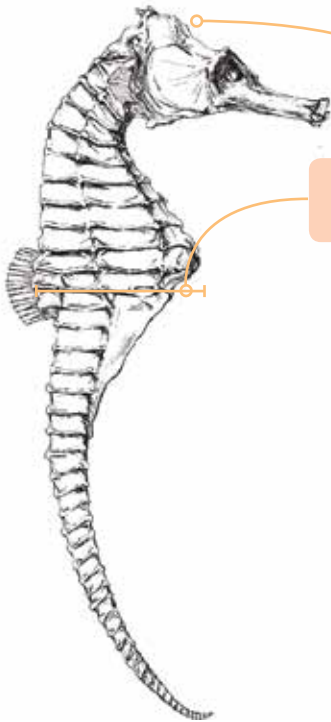
Photo: Dave Harasti



# COMMON SEAHORSE *Hippocampus kuda*

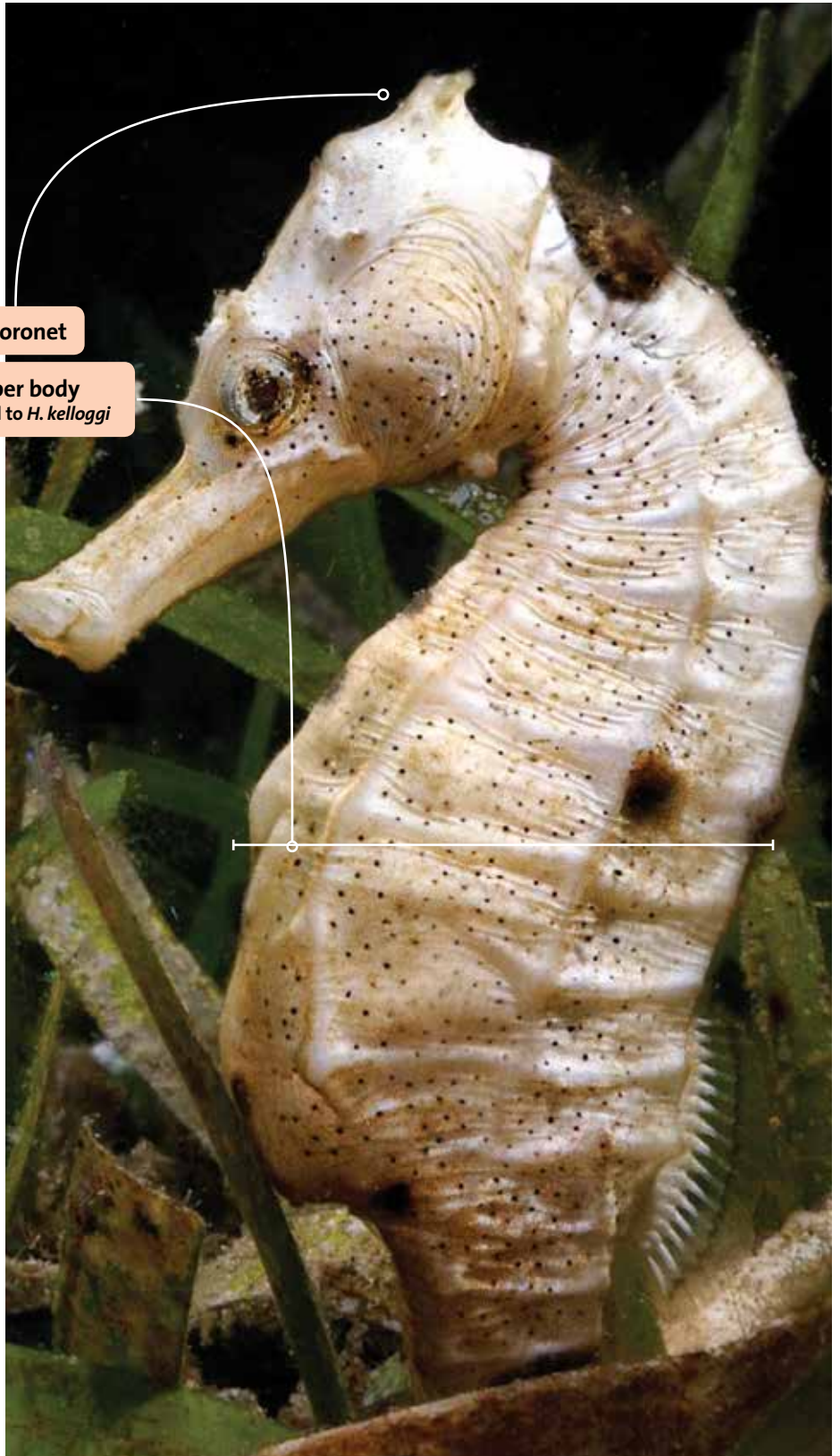


- Deep body (“fatter” compared to *H. kelloggi*)
- Low/round coronet
- Spines are rounded bumps



Low coronet

Deeper body compared to *H. kelloggi*



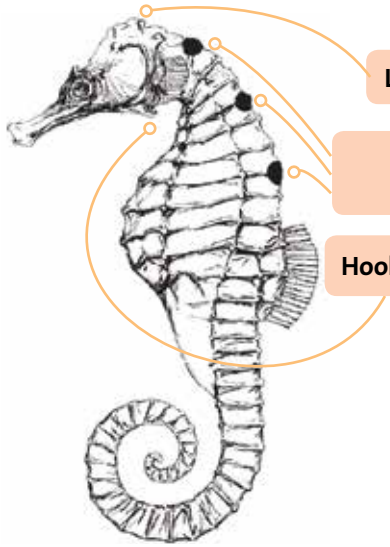
Color variation of *H. kuda*.



Photo: Wild Singapore/Ria Tan

Photo: Bettina Balnis

# THREE-SPOT SEAHORSE *Hippocampus trimaculatus*



Low coronet

3 dark spots (sometimes)

Hook-like cheek spine

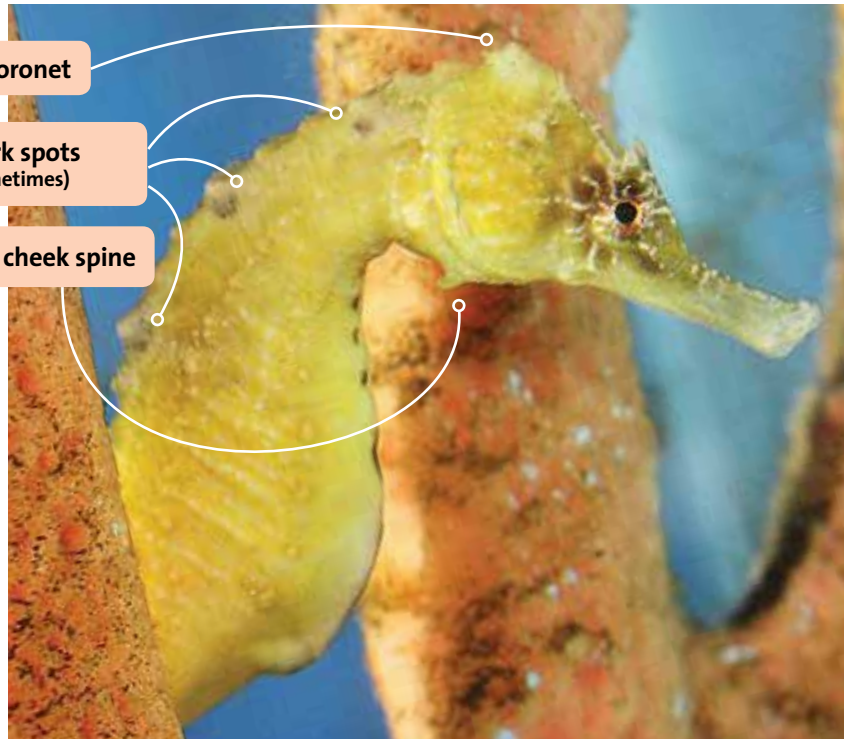
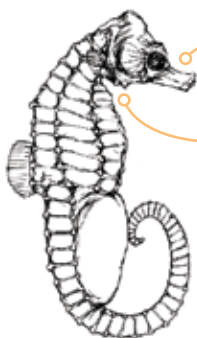


Photo: Tami Weiss/FusedJaw.com

- Hook-like cheek spine
- Hook-like eye spine
- (Sometimes) 3 dark spots along back of body

# JAPANESE SEAHORSE *Hippocampus mohnikei*

- Small body—adults have a maximum height of 8cm
- Very short snout compared to head
- Rounded, double cheek spines



Very short snout

Double cheek spines



Photo: Lindsay Aylesworth



## WINGED SEAHORSE *Hippocampus alatus*



Flat, outward-pointing spines  
sometimes resembling wings

- Paired, flattened spines behind head that point outward, sometimes with skin flaps (resembling wings)
- No nose spine



Photo: Jeffrey Low

Photo: Jeffrey Low