The Seahorse Trust report on

Seahorses in the River Dart, especially around the Noss-on-Dart development

Author: Neil Garrick-Maidment FBNA
Executive Director, The Seahorse Trust

The Seahorse Trust
Working in partnership with nature

1st March 2017

Contents

Pg 3 Introduction

Pg 4 British Seahorse Survey and National Seahorse Database

Pg 5 Seahorse species and ecology

- Pg 7 Distribution and habitat
- Pg 9 Breeding
- Pg 9 Pair bonding
- Pg 10 Migration

Pg 11 Seahorses on or in the River Dart

- Pg 11 River Dart complex
- Pg 12 Sightings list
- Pg 13 Map of the sightings on the River Dart

Pg 14 Legal protection

Pg 15 Conclusions and recommendations

Pg 17 Credits

Pg 17 References

Pg 19 Terms and conditions

Pg 20 Contact details

Introduction

It took many years to realise that seahorses are indeed indigenous to the British Isles and Ireland and work by The Seahorse Trust has finally proven this and further work by the trust led to both both species becoming fully protected under the Wildlife and Countryside Act.

For many years they were just considered as an accidental visitor to our shores but extensive work by the trust through its British Seahorse Survey (BSS) and the National Seahorse Database (NSD) that it runs has meant this species is fully accepted as British and Irish and accepted into the flora and flora of the UK.

The highly cryptic nature of the two native species of seahorse, the Short Snouted Seahorse *Hippocampus hippocampus* and the Spiny Seahorse *Hippocampus guttulatus* to the British Isles and Ireland make them very difficult to see and even more difficult to find and a large number of sightings on the NSD are from fishermen and beach walkers who have come across them accidentally.

Crucially to this report an absence or just receiving anecdotal of sightings should not be taken as an absence or lack of information about seahorses. Some sightings are anecdotal however they should be assumed to have substance (if from a reliable source) due to there origin which are often fishermen and divers.

Seahorses are usually just associated with seagrass but this is in reality not true *H.hippocampus* have a preference for mixed algae, large gravel and open sediment (with the odd tuft of algae or rocks to hide on). They are very seldom if ever found in seagrass and crucially to this report though they are often found on and in manmade structures.
H.guttulatus tends to be a seagrass specialist and both species are found throughout the River Dart.

Seahorses are highly susceptible to stress and disturbance and as such any development or even surveying for them must take this into account to minimise any problems that might occur for this highly protected species.

At all times based on historical sightings and the cryptic nature of the species it must be assumed that seahorses could be in the area and any works undertaken need to assume this.

British Seahorse Survey & National Seahorse Database

The British Seahorse Survey and National Seahorse Database was set up 1994 and it is now the longest running continuous survey of its kind in the world, containing over 1,800 records.

The survey and database are now run by The Seahorse Trust but it was set up by trust founder Neil Garrick-Maidment FBNA, author of this report and who has worked with seahorses for 37 years, specialising in British and European seahorses.

Data is collected from a variety of sources such as divers, fishermen and beach walkers and is recorded electronically and in paper form. The electronic data is compiled in an interactive spreadsheet using Microsoft Excel and this database is backed up on a second remote hard drive to avoid accidental loss.
The spreadsheet is hyperlinked to reports and maps showing exact location of both known species and species of indeterminate type.

The National Seahorse Database is recognised by all as the definitive database for the 2 native species of the British Isles and Ireland with records dating back to 1821 up to present day.

It was used by JNCC to afford both species full protection, under the Wildlife and Countryside act 1981in April 2008 and has been used in various Marine Conservation Zone consultations, successfully leading to the setting up and implementation of MCZ's.

Seahorse species and ecology

The British Isles are home to two species of seahorse, the Short Snouted (*H.hippocampus)* and the Spiny (*Hippocampus guttulatus)* known as the Spiny Seahorse in the UK and Malta and in other parts of Europe but it is also known as the Long Snouted Seahorse.

Photo 1: H.hippocampus (*H.hippocampus*)

Photo 2: Spiny Seahorse (*Hippocampus guttulatus*)

[Copyright, John Newman and The Seahorse Trust]

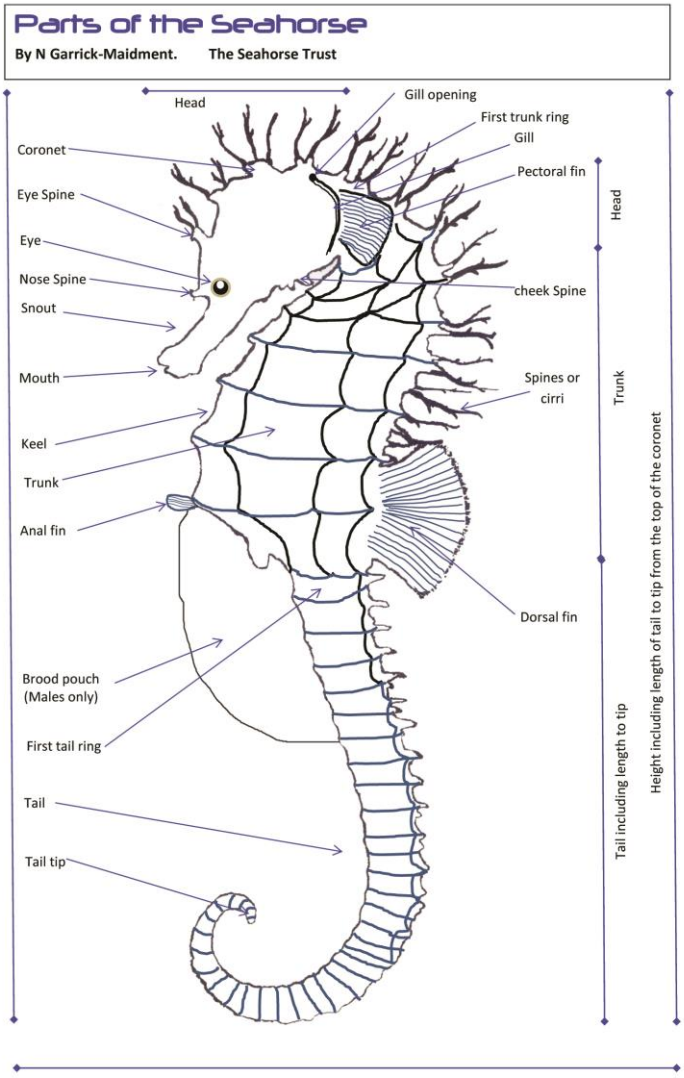
Both species retain the classic seahorse shape but are distinguished by the slightly differing shapes to the body, the lack of spines in the *H.hippocampus*, the difference in the length of snout between the species compared with the length of the head and the crest shape of the *H.hippocampus* coronet and the crown-like coronet of the *H.guttulatus.*

The *H.hippocampus* has a barrel-like body whereas the *H.guttulatus* has a slightly more elongated body, which in appearance is skeletal; the tail in both species is very long and fully prehensile, affording a particularly strong grip in extreme tidal and current movement.

The coronet on the top of the head are the easiest distinguishing feature between both species as it is crest like in *H.hippocampus* and forms a crown in the *H.guttulatus*. However,

sometimes with the growth of spines all over the coronet of the *H.guttulatus* it makes it difficult to see the actual shape of the coronet.

The spines which give the Spiny Seahorse its common name are seldom seen on *H.hippocampus* in the UK and Ireland however they are seen regulalrly in other parts of both species range throughout Europe. It is possible for both species to grow them but they can also reabsorb them depending on the habitat they are occupying and the age of the animal; young and sub adult H*.guttulatus* often have a profusion of spines all over their bodies which reduce in number as they get older and in some cases are completely gone when mature. The loss of spines due to age is because their territories are more settled and the adult *H.guttulatus* spends a lot less time swimming and moving and so does not need to have such elaborate camouflage.
As the spines are easily absorbed or grown so they are unreliable in identifying the species in which case other identification parameters are needed, such as the coronet, body shape and snout to head length.



Distribution and habitat

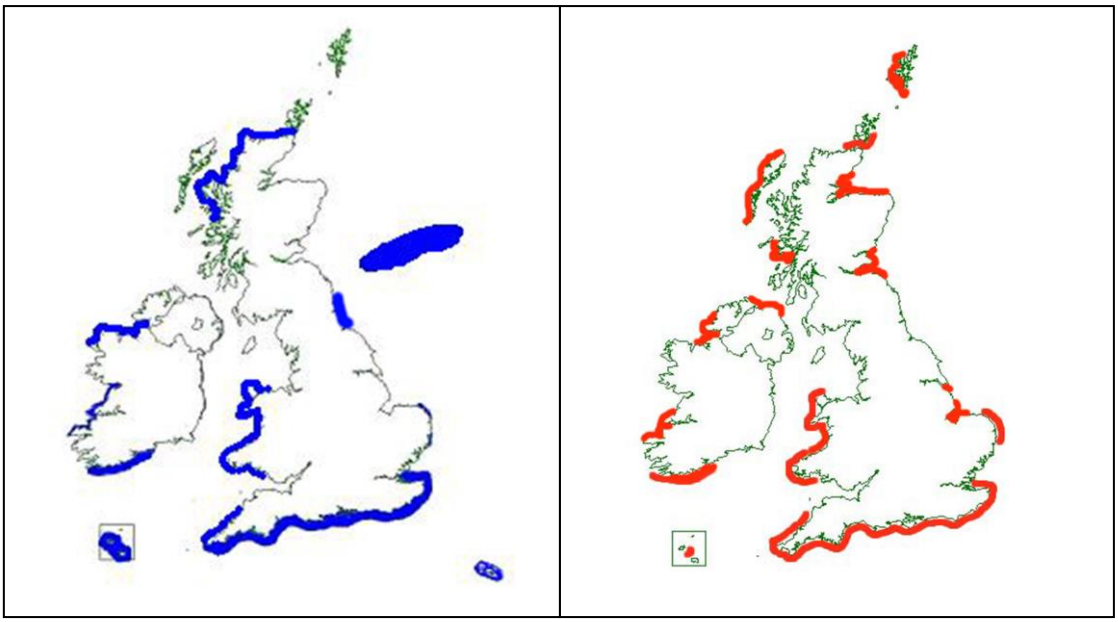


Fig 1 Distribution of the Short Snouted Seahorse. (*H.hippocampus*)

Fig 2 Distribution of the Spiny Seahorse Seahorse. (*Hippocampus guttulatus*)

[Copyright: The Seahorse Trust]

Both species range in the British Isles from the northern most Shetland Isles down (predominantly) the western coastline. This includes around the Irish coastline, down to and along the south coast, across to the eastern seaboard, and up into southern Norfolk. They have also been found down the east coast of Scotland, in most estuaries and out into the North Sea, onto the Dogger Bank (*H.hippocampus* only due to habitat).

It is possible their range continues all the way down the east coast and in other areas of the UK and Ireland but a lack of confirmed data (although there is a lot of anecdotal evidence) stops us completing this picture, further study is needed.

The main reason for the population to be more pronounced in the western region is the influence of the Gulf Stream which provides warmer, phytoplankton rich waters, ideal food for the zooplankton and small crustacea that the Seahorse; adult and fry are dependent upon and also for the seasonal regrowth of the seagrass meadows, favoured by the *H.guttulatus*.

Sightings come from a variety of sources such as divers, fishermen and beach walkers and the areas where most sightings occur such as in the south and west coasts are those that have the most human activity.

Importantly seahorses that live in sheltered areas such as Torbay, Salcombe Estuary or Poole Harbour seem not to migrate, in fact as it takes a great deal of energy to migrate there is an advantage in not doing so if it can be avoided.

The deepest recording of a *H.guttulatus* in the UK was one mile directly out from the River Dart river mouth at 70 metres depth and recorded by a fisherman when lifting his crabs pots into his vessel, the animal ended up in the National Marine Aquarium in Plymouth.

In the warmer months of the year as a generalisation *H.guttulatus* prefer to breed in shallow seagrass meadows, down to 3-5 m, whereas *H.hippocampus* average from 10m down to 20m to breed on a mix of habitats, however in sheltered areas such as rivers and enclosed lagoons they will habitually breed in much shallower areas.

H.hippocampus has a preference for mixed algae, large gravel and open sediment (with the odd tuft of algae or rocks to hide on). They are very seldom if ever found in seagrass; however crucially to this report though they are often found on and in manmade structures, with marinas and piers being a favoured habitat.

H.guttulatus should be really called Seagrass Seahorses as this is the habitat they are specialised to live in and their physical adaptions such as spines, skeletal look and base colour give them a major advantage in these habitats.

In the winter both species move deeper into open sand and sediment with small rocks and pebbles (see note above and the need to migrate or not). The move to migrate to deeper water appears to be stimulated by the onset of storms, whereas the drive to come up to shallow waters to breed is stimulated by longer day lengths and warmer temperatures. Arrival at the breeding grounds is timed to match peak breeding condition and maximum quantities of available food, as well as in the case of seagrass, extended growth to allow them to be able to hide away.

Generally assumed to just be a coastal species, in fact seahorses are frequently found in estuaries and up river complexes to the point of brackish water, although there have also been several records of seahorses entering into freshwater, such as on the River Tamar, Exe and up the Salcombe Estuary as high as Kingsbridge (where at times it is full freshwater and at other times it is saltwater) and there is no reason to suggest this is not a common occurrence.

They can enter into freshwater for short periods due to the unique structure of the gills which lie behind an almost sealed operculum (gill cover) which is closed except for a small siphon located at the very top of the gill cover. The actual gill structure resembles a bunch of grapes and is adapted to extract large amounts of oxygen out of the water.

Breeding

Male seahorses are male because they have testes and sperm and females have ovaries and eggs and yet they have a fully reversed breeding function where it is the male that gives birth, not the female. They are the only animals in the animal kingdom to have a truly reversed pregnancy.

Male seahorses have a fully functional brood pouch, lined with the equivalent of a placenta, allowing it to nurture fry after they are embedded into the lining of the pouch, through which they are then fed and provided with oxygen rich blood. This highly specialised brood pouch allows both species to give birth every 21 to 28 days (depending on the species) to fully functional highly developed, precocious offspring, giving them a greater chance of survival from birth; having said that out of every 2,000 fry born only 1 or 2 will survive to maturity.

Recent research by The Seahorse Trust has shown that occasionally some fry are born during the winter and this could be because the males were pregnant as they started their migration into deeper waters.

Where seahorses over winter in sheltered areas they have been known to breed during the winter but this does not seem to be as regular as during the warmer months; more research is required on this.

Pair bonding

Seahorses are known to pair bond for seasons, not as was originally thought for life. This makes more sense for a migratory species such as seahorses. Once they have settled for the warmer breeding season they actively seek a mate through an elaborate courtship dance.
This courtship dance is repeated daily with their mate and is used to enforce the pair bonding and also to determine the pregnancy state of their partner.

If during the early morning dance the female realises the male is not pregnant they will both through a series of mirrored circular movements and posturing turn to face each other and exchange eggs into the male's brood pouch.

At the moment of receiving these eggs the male drops away to the seabed and at the same time self-fertilise the eggs, wiggling from side to side as he does to ensure each egg is fertilised and they are then embedded into the lining of the pouch.

The pair bonding is reinforced every morning but when the first storms of the season come the pair will move away into deeper water breaking the bond.

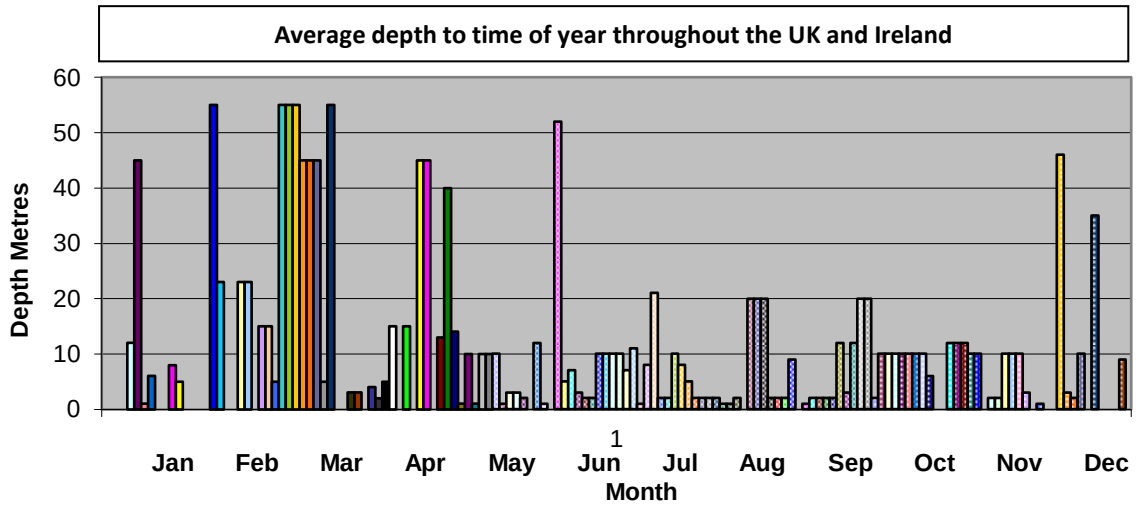
Migration

This is the same for both species and depends on weather and conditions. Migration is triggered by shorter/longer days, rise/fall in temperature and weather conditions.
From our observations at Studland in Dorset, *H.guttulatus* tend to leave in October and arrive from early May to June; we seldom see them on this site before the water temperature gets to between 9 and 11 degrees.

Like everything to do with seahorses this is not set in stone and there are always exceptions, depending on weather Etc. and mainly due to the exposure of the habitat and location site. In areas like Poole Harbour and parts of Torbay, the seahorses are there all year around, whereas exposed east facing sites like Studland (for example) they migrate.

Migration into deeper water seems more dependent on weather, than on temperature. As some of the warmer sea temperatures in the UK can occur in the autumn; it appears their vulnerability to storms is the deciding factor. Most seahorses washed onto beaches occur in early spring and the autumn when the storms strike; although the strength of the tail allows them to overcome very strong storms, tides and severe conditions, they do get caught out when they free swim due to disturbance or if the holdfast is ripped from the seabed.

One aspect of disturbance causing movement (crucially for this report) is lots of noise so that Seahorses are then more free swimming and unsettled, leading to leaving settled territories or separating from partners, anything that forces them to start swimming around could be detrimental. Erratic free swimming is a sign of disturbance, naturally seahorses are sedentary and when they naturally swim it is usually with the tail dragging on or close to the seabed or an object. When disturbed the pattern of free swimming is different, they rise up into the water column (very dangerous risk of predation at this point) and will swim with their tails curled up and they will be above the seabed or seagrass.



Seahorses on or near the River Dart

River Dart complex

The River Dart complex is home to both native species of seahorse and they are found throughout the Dart up to and including Dittisham (and possibly higher up the river), where they have commonly been found amongst the oyster sets and are assumed to feed on the extensive gatherings of Mysis shrimp and other crustacea that are found throughout the River Dart There are no set dates for these sightings in Dittisham basin as they occurred over a long period of time but mainly it appears to be mainly in the warmer months of the year.

Dittisham is generally accepted as the most northern point of salt water on the river and from this point up it is brackish going into fresh water.
As the river has an extensive tidal range, this brackish point fluctuates up and down the river and so it is possible that on occasion seahorses would be above Dittisham but this would be very occasional and not a permanent situation (see the notes on seahorses in freshwater in the Distribution and habitat section above)

Dittisham with its high levels of salt water are considered the highest point for most salt water species, seahorses included, and because it opens out into a large shallow area this is where the water speed slows down and many species are found in the basin area, that are not found elsewhere higher up the river.

As the River exits the Dittisham Basin at the quayside of Dittisham there are a couple of sightings of note, one is on the quayside (E88 on the map below) where a number of seahorse fry were seen swimming alongside the quay (the description was confirmed by phone call, to make sure it was not another species and was indeed seahorses).

Also of significance, there is an anecdotal sighting in a thin strip of seagrass directly on the other side (east) of the river where the ferry boat lands, although this was not photographed, the conversation was descriptive enough that it led the author to accept it as a genuine sighting.

Down from these sightings were E177 a pregnant male *H.hippocampus* just a few hundred metres or so from Noss Boat yard. This animal was caught photographed and then put back into the river.

At Noss boat yard itself there have been anecdotal sightings but nothing confirmed with a photograph or other definitive proof but as the site contains many structures sticking out into the river there is every reason to suggest this site has or could have contained seahorses in it, the lack of visual proof is not enough to suggest the species is not there.

Going further down the river at Dartmouth, Kingswear and the river mouth there have been a number of confirmed sightings and in conversation with local boat owners and fishermen there is every good reason to suggest there is a resident population of seahorses in the river.

Crucial to the overall knowledge of seahorses in the River Dart is the presence of seahorses in nearby Salcombe Estuary and around into Torbay. In both of these areas there have been quite a number of sightings and there is good evidence to suggest the species is found right along the south coast and into all the estuaries and rivers along this coastline as high up as the brackish water levels.

Sightings list

- **E68** 19/10/1998 (H.guttulatus) S of Noss Marina on the edge of River Dart Found in crab pot
- **E88** 1988 (species unknown) Greenaway Quay, Dittisham side, River Dart. Seahorse fry (lots of fry seen in one batch)
- There was also one anecdotal sighting immediately across from Greenaway Quay in the small strip of seagrass that occurred off the bank in a think line (about 1 metre wide) which runs for 10 to 15 metres.
- **E115** 26/7/2004 (species unknown) The Pontoons at Kingswear, River Dart approx. 2" several in number, caught in a child fishing net
- **E170** 20/4/2006 (H.hippocampus) River Dart mouth
- **E177** 8/7/2006 (H.hippocampus) Noss Boat yard and Maypool
  There have been other sightings reported here but not reported officially as the dives were undertaken illegally, these were seen at E177 and at Maypool itself (Maypool on the map), along the river's edge, all the sightings were of H.hippocampus
- **E232** 23/5/2007 (H.guttulatus)
- **E533** 1/2/2007 (H.guttulatus 1 mile out from River mouth

There is every good reason to assume the presence of seahorses in the River Dart, especially near to the Noss-on Dart site, based on actual sightings and anecdotal evidence. This is also based on knowledge of the ecology of seahorses along the Devon coastline, estuaries and river systems.

Map 1: Location of known seahorse sightings (numbered) and anecdotal (pink polygons) sightings in the River Dart

Legal protection

On the 6th of April 2008 The Seahorse Trust succeeded in getting both native species of seahorse protected under the Wildlife and Countryside Act 1981 as amended.

They are protected under Schedule 5, section 9 and as such they are protected from intentional killing, injury or being taken from the wild, being possessed or controlled or crucially in relation to this report they are protected from having their place of shelter damaged or destroyed or being obstructed to their place of shelter

The WCA schedule 5, section 9 states, it is illegal to:

Section 9	
Part 1	intentional killing, injuring, taking
Part 2	possession or control (live or dead animal, part or derivative)
Part 4 (a)	damage to, destruction of, obstruction of access to any structure or place used by a scheduled animal for shelter or protection
Part 4 (b)	disturbance of animal occupying such a structure or place
Part 5 (a)	selling, offering for sale, possessing or transporting for the purpose of sale (live or dead animal, part or derivative)
Part 5 (b)	advertising for buying or selling such things

Conclusions and recommendations

As can be seen from this report seahorses are a highly cryptic species, that are not easy to detect even in purpose led surveys and so the lack of sightings should not conclude that there is an absence of seahorses in any area, especially as in areas like the River Dart where they have been recorded above and below the proposed development site.

Some sightings in this report are anecdotal however they should be assumed to have substance due to the origin which were fishermen and divers, others anecdotal sightings have not been included in this report as their substance or origins were not substantial enough to be listed.

As well as being cryptic seahorses are also highly adaptable, *H.hippocampus* more so than *H.guttulatus* and their ability to utilise a variety of habitats is one example of this.
H.hippocampus has a preference for mixed algae, large gravel and open sediment (with the odd tuft of algae or rocks to hide on). They are very seldom if ever found in seagrass, however crucially to this report though they are often found on and in manmade structures.
H.guttulatus however tend to be seagrass specialists but they do occasionally get found in other habitats, especially during the winter months and they have been found in several areas in the River Dart.

Stress is highly destructive to seahorses and this can take many forms such as noise, habitat loss, uncontrolled diving, in fact anything that unsettles them from their normally sedentary life style. Naturally seahorses are quite sedentary, do not move much and usually remain firmly anchored to objects by their highly prehensile tail, stress changes all of this.

When disturbed (crucially noise and large amounts of sediment can cause this) it causes seahorses to be more free swimming so anything that forces them to start free swimming is bad for them. When disturbed the pattern of free swimming is very different to their normal determined swimming, where the tail is usually anchored or touching an object, so they can quickly secure themselves if needed.
When stressed, they will rise up into the water column (very dangerous risk of predation at this point) and will swim with their tails curled up and they will be above the seabed or seagrass, often this can lead to disorientation which in the long term might mean losing contact with their mate or having to find a new territory which in turn means a reduction in breeding cycles, potentially reducing the output of fry in the main breeding season.

Extreme stress can cause death; this is not normally due to the stress itself, such as noise or sediment but the effects of diseases that the seahorse has normally dormant in their bodies.

They have a number of diseases such as vibrio or TB dormant in the body which is kept fully under control, when they get stressed one of these diseases takes hold of the stressed seahorse and it usually leads to death in a few weeks.

Recommendations

- The presence of seahorses should always be assumed
- A survey should be undertaken, prior to any development being undertaken
- Work should be undertaken during the winter months to potentially minimise seahorse disturbance
- If work is being undertaken during the breeding season and if seahorses are located then work should either stop or the seahorses should be relocated much further downstream into a suitable habitat
- Work should take into consideration sediment in the water and disturbance to the seahorses if the habitat is disturbed or if old pilings under water are damaged or built upon.
- Where possible keep sedimentation to a minimum not just for the area being worked upon but also for down or upstream where seahorses may be in residence
- Noise levels should be kept to a minimum, as loud noise will unsettle seahorses, which can lead to them deserting their mate and breeding territory
- All activities that can lead to stress should be minimised

Credits

Front cover	H.hippocampus pair	Neil Garrick-Maidment
Photo 1	H.hippocampus pair	John Newman
Photo 2	Spiny Seahorse	Neil Garrick-Maidment
	Parts of the seahorse	Neil Garrick-Maidment
Distribution map 1	H.hippocampus	The Seahorse Trust
Distribution map 2	Spiny Seahorse	The Seahorse Trust
Seahorse depth chart	Times of the year	The Seahorse Trust
Map 1	Location of the River Dart sightings	Google Earth
Table 1	Wildlife and Countryside Act	JNCC

References

Anderson,PA Ilze K. Berzins, Frank Fogarty, Heather J. Hamlin, Louis J. Guillette Jr Sound, stress, and seahorses: The consequences of a noisy environment to animal health. Aquaculture 311 (2011) 129-138.

Caldwell, IR and Vincent ACJ (2012) A sedentary fish on the move: effects of displacement on long-snouted seahorse (*Hippocampus guttulatus* Cuvier) movement and habitat use. *Environmental Biology of Fishes* **96**: 67-75.

Caldwell,IR M. Correia, J. Palma and A. C. J. Vincent ., Advances in tagging syngnathids, with the effects of dummy tags on behaviour of *Hippocampus guttulatus*. *Journal of Fish Biology* (2011) **78**, 1769–1785 doi:10.1111/j.1095-8649.2011.02983.x, available online at wileyonlinelibrary.com

Collins. KJ, AM Suonpää and JJ Mallinson. School of Ocean and Earth Science, University of Southampton, National Oceanography Centre, Southampton, UK
The impacts of anchoring and mooring in seagrass, Studland Bay, Dorset, UK
doi:10.3723/ut.29.117 International Journal of the Society for Underwater Technology, Vol 29, No 3, pp 117_123, 2010

Correia.M, J. Palma, H. Koldewe and J. P. Andrade. The use of a non-invasive tool for capture–recapture studies on a seahorse *Hippocampus guttulatus* population. *Journal of Fish Biology* (2014) doi:10.1111/jfb.12304, available online at wileyonlinelibrary.com

Garrick-Maidment.N (1)., John Newman (2)., Dr Eva Durant (3) 2010. Movement of a pair of Spiny Seahorses (*Hippocampus guttulatus*)seen during the summer of 2010 at Studland Bay in Dorset. The Seahorse Trust. *Published Online.*

Garrick-Maidment.N (1), S Trewhella(2), J Hatcher (2), K.J. Collins (3) and J.J Mallinson (3) 2010. Seahorse Tagging Project, Studland Bay, Dorset, UK *Marine Biodiversity Records, page 1 of 4. # Marine Biological Association of the United Kingdom. doi:10.1017/S175526721000062X; Vol. 3; e73; 2010 Published online*

Garrick-Maidment.N 2013. Temperature and day length related seasonal movement of seahorses at South Beach in Studland Bay in Dorset.
The Seahorse Trust. *Published Online.*

Garrick-Maidment.N, 1998. A note on the status of indigenous species of seahorse. *JMBA, 78(2), 691-692*

Garrick-Maidment.N., 2011. British Seahorse Survey Report 2011. The Seahorse Trust *published online.*

Garrick-Maidment.N (1), S Trewhella(2), J Hatcher (2), K.J. Collins (3) and J.J Mallinson (3) 2010. Seahorse Tagging Project, Studland Bay, Dorset, UK Marine Biodiversity Records, page 1 of 4. # Marine Biological Association of the United Kingdom. doi:10.1017/S175526721000062X; Vol. 3; e73; 2010 Published online

Garrick-Maidment.N (1)., John Newman (2)., 2008. Diver Study of wild H.hippocampus (*H.hippocampus*) in Torbay, Devon. The Seahorse Trust. Published Online.

Garrick-Maidment.N (1)., John Newman (2)., Dr Eva Durant (3) 2010. Movement of a pair of Spiny Seahorses (*Hippocampus guttulatus*)seen during the summer of 2010 at Studland Bay in Dorset. The Seahorse Trust. Published Online.

Garrick-Maidment.N 2012. Seahorses and Seagrass - Diving Protocols**.** The Seahorse Trust. Published Online

Garrick-Maidment.N,2011. The Spiny Seahorse Tagging Project. Country-Side, British Naturalists Association. 28p (19 – 25) 2011.

Garrick-Maidment.N, 2012. Seahorses in Poole Harbour in Dorset. The Seahorse Trust. Published Online.

Garrick-Maidment.N, 2010. Seahorses around Devon. JMBA Global. Spring 2010 issue 11.35p (30 – 31)

Garrick-Maidment.N, 2007. British Seahorse Survey Report 2007. The Seahorse Trust published online.

Garrick-Maidment.N, 2004. British Seahorse Survey Report 2004. 82 p. Topsham, Devon: The Seahorse Trust.

Garrick-Maidment.N, 1997. British Seahorse Survey Report 1997. The Seahorse Trust published online.

Dr. E Jackson and Dr. KJ Collins. A guide to assessing and managing anthropogenic impact on marine angiosperm habitat (NECR111) by found on the Natural England website. http://publications.naturalengland.org.uk/publication/3665058

Lamb.S, 2013. Investigating differing aquaria environments and their influence on natural behaviours and breeding patterns of captive-bred short-snouted seahorses, *H.hippocampus* (Linnaeus, 1758). Msc Sustainable aquaculture systems. Plymouth University

Pinnegar.JK (1), Vanessa StelzenmÜller (1), Jeroen Van Der Kooij (1), Georg H. Engelhard (1), Neil Garrick-Maidment (2) & David A. Righton (1) 2008. Occurrence of the short-snouted seahorse H.hippocampus in the central North Sea. *Cybium 2008, 32(4) : 343-346*.

Terms and conditions

Contact details

The Seahorse Trust
British Seahorse Survey
National Seahorse Database
c/o 36 Greatwood Terrace (registered office)
Topsham
Devon
EX3 0EB

Charity number 1086027

Tel: 01404 822373

e-mail neil.seahorses@tesco.net
web: www.britishseahorsesurvey.org
web: www.theseahorsetrust.org