

# Seadragon Q & A with Dr. Booth

## Seadragon strandings... and climate change?

Dr. David Booth is a Professor at the University of Technology in Sydney, Australia and the Focal Point for Seadragons in the global expert group for conservation of seahorses, pipefishes and seadragons (IUCN SSC SPS SG). Here, he shares his thoughts about seadragons and their conservation.

### What are seadragons?

Seadragons are three species of magical and mysterious fishes; weedy seadragon, leafy seadragon and ruby seadragon. They are close relatives of the seahorses and pipefishes (family Syngnathidae), have a long tube snout and trailing ornamental appendages, and reach about 40 cm in length.



### Where are seadragons found?

Seadragons occur only along Australia's southern reef coastline. They live in seagrass or kelp forests, often right where the seaweed meets the sand line, in quite shallow depths.



### What's so special about seadragons?

Seadragons are iconic in their appearance, exhibit exquisite colours, and males brood developing embryos on the underside of their tails.

### What's this we hear about seadragons appearing on Sydney beaches?

During April and May 2022, we had reports of many weedy seadragons being washed up on shorelines in the Sydney region.



### How did you hear about the seadragon strandings?

As seadragon researchers for over 20 years now, we occasionally get reports from the general public of stranded seadragons, sometimes after storm activity. However, an unprecedented number of reports started arriving from beach walkers in early April 2022. I did a newspaper and a radio article to highlight this, which led to many more reports arriving.

### How many seadragons were involved?

Somewhere between 100 and 150 seadragon carcasses have been identified, probably 50 times above the normal rate of washups. We still have to sift through all the reports, many of which have images, and some of which are associated with collected carcasses. We will process each image, including checking with Seadragon Search (<https://seadragonsearch.org>), to find out about live sightings of each animal.

### Why did the seadragons strand?

The seadragon strandings in 2022 are likely due to the intense storm weather in SE Australia that summer. The timing of these washups coincided with a massive set of “East Coast Low” storms (atmospheric low pressure cells increasing due to climate change) and huge rainfall; Sydney had 50% more rain in Feb – April 2022 than the whole of 2021. So, the cause of these strandings is likely a combination of freshwater influx, high sediment load, physical damage by waves and surges, and possible urban pollution and depleted food source (mysid shrimp). We are currently collecting any stranded specimens to examine for any clues on the causes of death.

### How might such strandings affect local seadragon populations?

Data from divers that regularly visit Sydney’s coastal reefs suggest disappearances of seadragons from most, but not all sites. We are now leading the “Sydney Seadragon Census” to work with dive clubs in estimating how many seadragons live in the seas off Sydney.

### Are seadragon strandings a new problem?

We’ve never seen anything like this scale of wash ups, even though strandings do sometimes happen during storms.

### Do you expect this to happen more often in the future?

Given the strong link of the East Coast Lows to human-caused climate change, we worry that such events could become more frequent and devastating in future.

### Is fishing putting pressure on seadragon populations?

Seadragons are protected species in Australia, so no legal fishing takes place and illegal take is probably minimal.

### Is habitat loss affecting seadragon populations?

Weedy seadragons in SE Australia are found in or near kelp habitat where they prey on swarms of mysid shrimp for food. In SE Australia, kelps are under threat from climate change, urban pollution poses a threat, and their geographic ranges may be shifting towards the Antarctic. All this may create a risk of seadragon population declines.

### What can be done, if anything, to mitigate the effects of climate change for seadragons?

Globally, reducing the use fossil fuels can help seadragon populations. Locally, it is very important to take pressure off seadragon habitats to improve their resilience to climate change. Creating and enforcing no-take marine parks is one important initiative.

### Can we culture seadragons and then release them?

A captive breeding program would be difficult and reintroduction would likely create problems for wild populations. Some public aquariums are succeeding with breeding a few seadragons, enough to support exhibits of these wondrous animals. However, releasing animals can be very risky, especially given that we have found high genetic differences among weedy seadragon populations. Releasing seadragons might introduce disease and disrupt social behaviours of the wild seadragons.

### Where can I see seadragons?

Seadragons float around shallow reefs around southern Australia or in public aquaria worldwide.

### What is your favourite story about seadragons?

A number of children's books and even a play have been written on weedy seadragons lately, like the one below (left). They were also featured in the writings of classic Aussie author May Gibbs in books I had as a child, written over 100 years ago (below, right).



### Where can I learn more about seadragons?

You can go to these websites:

Leafy seadragon – <https://www.iucnredlist.org/species/17096/67622420>

Weedy seadragon – <https://www.iucnredlist.org/species/17177/67624517>

Ruby seadragon – <https://www.iucnredlist.org/species/87568739/115514038>

[www.iucn-seahorse.org/\\*\\*](http://www.iucn-seahorse.org/**)

<https://seadragonsearch.org>

#### **Project Leader:**

Prof David Booth

#### **Collaborators:**

Sam Allan, Dr Selma Klanten, John Turnbull (Underwater Research Group), Klara Janickova

## More Information & Articles

IUCN:

<https://www.iucnredlist.org/species/17177/67624517>

<https://www.iucnredlist.org/species/17096/67622420>

<https://www.iucnredlist.org/species/87568739/115514038>

Sir David Attenborough's favorite animal is the weedy seadragon:

<https://mobile.twitter.com/7NewsSydney/status/972014883142172673>

Seadragon search:

<https://seadragonsearch.org/>

## References

Allan, S. J., O'Connell, M. J., Harasti, D., Klanten, O. S., & Booth, D. J. (2022). Searching for seadragons: predicting micro-habitat use for the common (weedy) seadragon (*Phyllopteryx taeniolatus*) based on habitat and prey. *Journal of Fish Biology*, 100(4), 935–943.

<https://doi.org/10.1111/jfb.15025>

Allan, S. J., O'Connell, M. J., Harasti, D., Klanten, O. S., & Booth, D. J. (2022). Space use by the endemic common (weedy) seadragon (*Phyllopteryx taeniolatus*): influence of habitat and prey. *Journal of Fish Biology*, 100(1), 175–183. <https://doi.org/10.1111/jfb.14931>

Klanten OS, Gaither MR, Greaves S, Mills K, O'Keeffe K, Turnbull J, et al. (2020) Genomic and morphological evidence of distinct populations in the endemic common (weedy) seadragon *Phyllopteryx taeniolatus* (Syngnathidae) along the east coast of Australia. *PLoS ONE*, 15(12), e0243446. <https://doi.org/10.1371/journal.pone.0243446>

Sánchez-Cámara, J., Booth, D.J., Murdoch, J.D., Watts, D., & Turon, X. (2006). Density, habitat use and behaviour of the weedy seadragon *Phyllopteryx taeniolatus* (Teleostei: Syngnathidae) around Sydney, New South Wales, Australia. *Marine and Freshwater Research*, 57, 737-745.

<https://doi.org/10.1071/MF05220>

Sánchez-Cámara, J., & Booth, D.J. (2004). Movement, Home Range and Site Fidelity of the Weedy Seadragon *Phyllopteryx taeniolatus* (Teleostei: Syngnathidae). *Environmental Biology of Fishes*, 70, 31-41. <https://doi.org/10.1023/B%3AEBFI.0000022850.33643.e3>

Sanchez-Camara, J., Martin-Smith, K., Booth, D. J., Fritschi, J., & Turon, X. (2011). Demographics and vulnerability of a unique Australian fish, the weedy seadragon *Phyllopteryx taeniolatus*. *Marine Ecology Progress Series*, 422, 253–264. <https://doi.org/10.3354/meps08920>

Sánchez-Cámara, J., Booth, D.J., & Turon, X. (2005). Reproductive cycle and growth of *Phyllopteryx taeniolatus*. *Journal of Fish Biology*, 67, 133-148. <https://doi.org/10.1111/J.0022-1112.2005.00720.X>

Sanchez-Camara, J., Booth, D.J. and Turon, X. (2005), Reproductive cycle and growth of *Phyllopteryx taeniolatus*. *Journal of Fish Biology*, 67: 133-148. <https://doi.org/10.1111/j.0022-1112.2005.00720.x>