

Gender-bending fish share their secrets

May 16 2013, by Leigh Dayton



A Weedy Seadragon looking for cover from greedy predators. Credit: Erik Schlögl

When David Booth spotted his first seadragon he thought the colourful 40 centimetre-long fish looked like an intergalactic hybrid: half alien, half animated seaweed. "They are amazing things," the marine ecologist says.

Its oddball [appearance](#) not only gives the quirky creature its name – weedy seadragon or *Phyllopteryx taeniolatus* – it provides cover from

hungry predators. "A fast escape or sharp scales are definitely not in their protective repertoire," says Professor Booth, Director of the Centre for [Environmental Sustainability](#) at UTS. "They just blend in."

Little wonder he's keen to ensure that seadragons, found only in [Australia](#), blend in for [generations](#) to come. While they're protected under the Commonwealth Environment Protection & Biodiversity Conservation Act (1999), evidence suggests seadragon numbers are falling. The World Conservation Group, also known as the International Union for Conservation of Nature, has classed them as "near threatened" on its Red List of threatened species.

But nobody knows for certain. Professor Booth's former doctoral student, Jamie Sánchez-Cámara, says the species is "data deficient". That's despite his pioneering research, mainly at three sites around Sydney: Kurnell, Botany Bay and North Bondi.

It's not good enough for a charismatic fish that starred in the opening ceremony of the Sydney Olympics, is the official marine emblem of the state of Victoria and is famous for its topsy-turvy sex life. Like fellow Syngnathidae – seahorses, pipefishes and pipehorses – males incubate eggs deposited by females.

The solution: citizen science. As a first step Professor Booth, his UTS team and Dr Sánchez-Cámara (now with Spanish company Aquadec Aquariums) have teamed up with the Abyss Scuba Diving club near Botany Bay National Park.

The plan is to conduct detailed surveys of weedy seadragons living along the rocky reef at Kurnell. In April the first group of "researchers" donned scuba gear and got to work, underwater cameras in hand.

The free labour was easy to recruit says Abyss diving instructor Rachael

Fallon. "Divers love them," she says. "They're quite beautiful and easy to photograph. They swim so slowly you can put the camera right up to their face."

That is, she adds, after you spot them. "Like a koala in a tree, they're hidden – but once you see one you see them everywhere."

Professor Booth says the volunteers will record the location of the seadragons they observe and take photos of telltale markings on their flanks. "The dorsal spots are like fingerprints," he says. "We'll use the photos to identify individuals and monitor them over time."

Abyss plans to run monthly "weedy dives" and send the photos to Professor Booth. "Hopefully we'll get a regular group and others who do them on their own," Ms Fallon says. "The long-term plan is a website where people can post photos."

The results will add to doctoral data collected by Dr Sánchez-Cámara beginning in 2001. Back then it wasn't known that dorsal spots were life-long identifiers. Instead, each [fish](#) was gently restrained, injected with a harmless florescent marker and measured.

Follow-up surveys were conducted in 2002, 2004, 2007 and 2009. The UTS team collaborated with the marine conservation group Project Seahorse in 2003, 2004 and 2009, surveying seadragon populations at Tasmania's Kingston Beach and Blackmans Bay.

"We looked at growth rate, abundance, movement, pregnancy and death rates," Professor Booth says. "We were able to show seadragons live up to six or seven years. Seahorses live three to four years and pipefish only three months."

They also discovered that seadragon numbers fell in both NSW and

Tasmania between 2001 and 2009. Why? Is the decline temporary, produced by natural causes? Or is it a result of disease, invasive species and disruptive human activity, from habitat loss, pollution or climate change? If so, what are the best conservation strategies?

Professor Booth is optimistic the ongoing work will identify answers and solutions which, if applied, could protect seadragons. He's less certain about resolving a long-running scientific quandary: Why do "pregnant" males carry eggs, while females love them and leave them.

"It's one of those big questions you'd think we have the answer to but we don't."

More information: www.seadragonresearch.com/

Provided by University of Technology, Sydney

Citation: Gender-bending fish share their secrets (2013, May 16) retrieved 29 April 2024 from <https://phys.org/news/2013-05-gender-bending-fish-secrets.html>

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