

THE SEX LIFE OF THE AUSTRALIAN GIANT CUTTLEFISH

**SWINGING
SEPIAS**



A frenzied and brutally competitive mating ritual of these highly evolved cephalopods takes place every year in the shallow waters of Whyalla

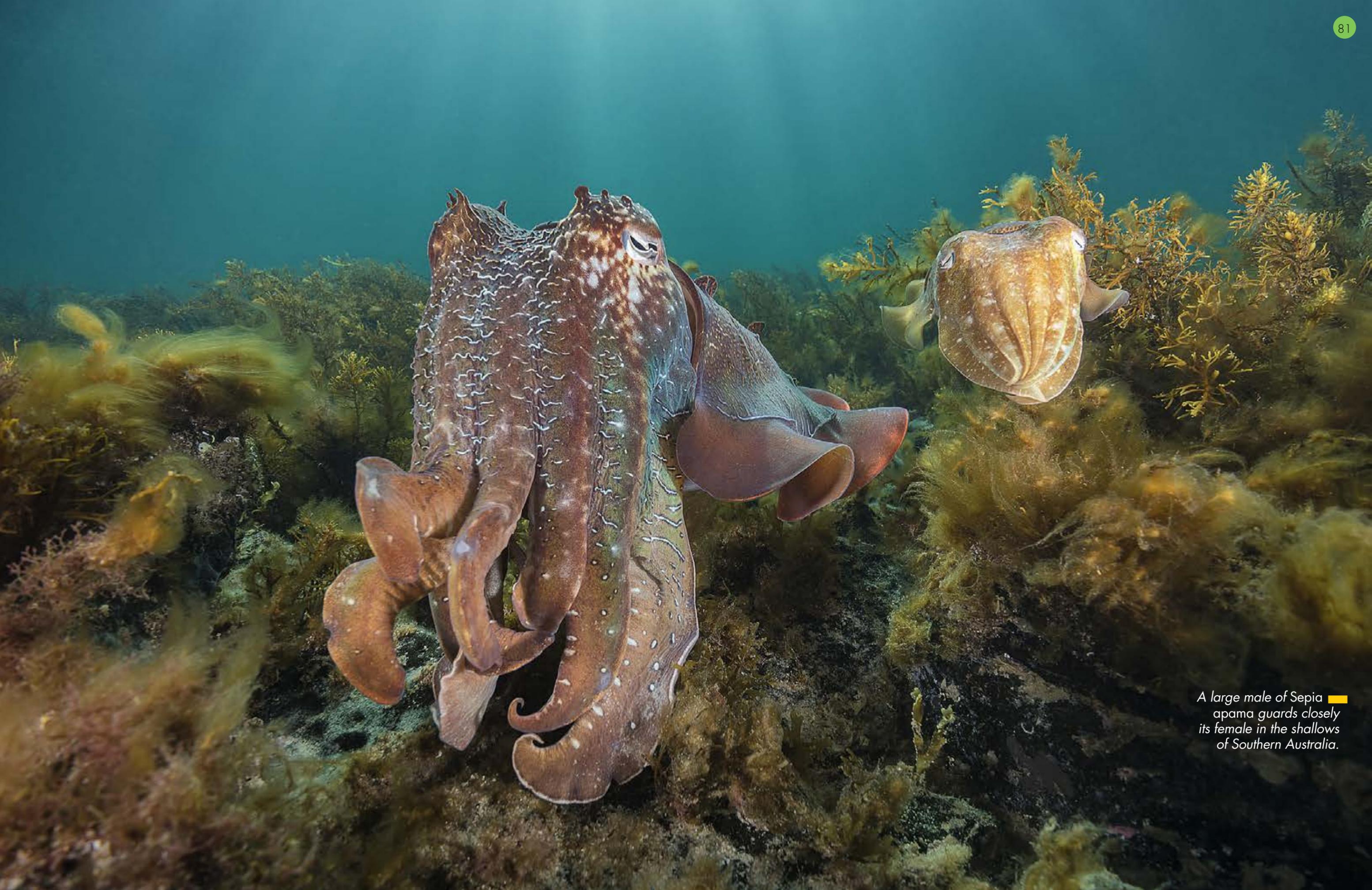
■ A large male of *Sepia apama* displaying its colors.



TEXT AND PHOTOS
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The Giant Australian Cuttlefish *Sepia apama* is the largest cuttlefish in the world and can reach half a metre in total length and weigh in at up to 11 kg. Solitary animals, they are found all along the coastline of the southern half of Australia - from Central Queensland on the east coast, right around the bottom of the continent and up to Ningaloo Reef in Western Australia. Incredibly photogenic creatures, they have a fascinating ability to rapidly change their colour and skin texture, which they use to great effect as camouflage when they are hunting or being hunted, to communicate with other cuttlefish and as part of the amazing displays they use to impress potential partners during the mating season. Giant Australian Cuttlefish are also remarkable intelligent, and are said to have the largest brains of all marine invertebrates. Both male and female cuttlefish have relatively short life cycles of 1-2 years, and interestingly they have two alternate development cycles - with the first using a "growth spurt" over 7 to 8 months to reach maturity by their first summer so they are ready to mate at the start of winter. The second cycle involves much slower growth where they don't reach maturity until they are in their second and final year. Although not scientifically proven, the most probable reason for the alternate cycles is that it is nature's way of hedging bets, so that if a catastrophic event occurs one year, there is a backup population that can still breed the following year.

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A large male of *Sepia apama* guards closely its female in the shallows of Southern Australia.



As winter approaches, the cuttlefish abandon their solitary lifestyle and aggregate together in small groups of up to 10 individuals to mate - everywhere, that is, except at Whyalla in South Australia's Spencer Gulf, where hundreds of thousands gather during the annual Giant Australian Cuttlefish aggregation. The reality is that you would have to be quite lucky to stumble upon a typical mating aggregation anywhere else, but at Whyalla's aggregation you literally only have to walk in off the beach and the cephalopod version of Sodom and Gomorrah is all around you! It has been called the "the premier marine attraction on the planet" by distinguished marine biologist Roger Hanlon, of the Woods Hole Oceanographic Institution, and it starts from around the middle of May

each year, lasting for about two months. Whyalla's Giant Australian Cuttlefish aggregation is really quite unique as *Sepia apama* is not known to gather in such numbers anywhere else in the world. It is also an incredible spectacle to behold, and one that allows the underwater photographer very close access, particularly to the large bull males, that is simply not possible at any other time. So preoccupied are the bulls with ensuring their role in the reproductive process they simply ignore divers and photographers as they concentrate on the task to hand... To put their dilemma into perspective - overall the population of Giant Australian Cuttlefish has a male to female ratio of almost 1:1, but during this unique mating event at Whyalla that ratio changes and can reach as high as 8 males to 1 female.

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Left, Black Point, near Whyalla in South Australia; right, a large male with its female.



■ The fight for mating begins - a large male and its female are being surrounded by a host of young challengers.



Right,  divers entering and leaving the water. Left, a large male as it displays its mating livery.



So the competition is incredibly intense and explains the large bull males' preoccupation with their captive females - one slip in concentration will ensure the prize is seized by one of this many competitors! The stakes are very high for all the older participants as it is the last roll of the dice for them and all will be dead by the end of the mating season as the cycle of life evolves and continues.

The technical term for how Giant Australian Cuttlefish mate is *polyandry* - which basically means that each female cuttlefish will have multiple male partners to ensure better genetic variability of the species. All of which makes sense from a somewhat dry overall perspective, but when viewed in practice at Whyalla, where so many cuttlefish have gathered

and the females are outnumbered by as much 8 to 1, it takes on a completely different dynamic and the definition "spectacularly promiscuous" would probably better describe the apparently licentious and almost wanton behaviour. Apart from the larger size of adult bull males, it is almost impossible to identify a male Giant Australian Cuttlefish from a female one - even the cuttlefish themselves cannot tell the difference, and males display a subtle zebra pattern on their sides to signal their sex. The large bull males are able to put on the most spectacular colour displays to try and attract a female, but it is up to her whether she accepts and studies have shown that up to 70% of the time they don't. If she does accept, the bull male will then try and keep her hidden in the seagrass - out

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■ A large male - the individual on the right - as it warns off a young male challenger.



Far left, a large male is surrounded by several young challengers; left top, a big male and its female; left bottom, a large male is hiding its females from the competition.

of sight from all the other males. But that's not easy with so many other males around, most of whom are smaller and still in their first year of life. These smaller males are often referred to as "sneakers" because, lacking the physical size and strength to challenge the bulls, they adopt an alternate strategy and very clever of pretending to be a female and sneaking in with the real female while the bull is busy fending off larger males. The interpolator then tries to mate with the female - often with great success and much to the annoyance of the bull when he realizes what is happening.

Cuttlefish conservation in Whyalla has been somewhat of a long, but ultimately (for now, at least...) successful journey. Talk to the local divers who have been around for a while and they will tell you that early

on they did not think there was anything that special about the annual aggregation of Giant Australian Cuttlefish around Black Point and Point Lowly. They assumed that similar events must be occurring elsewhere, but as word spread and marine biologists and scientists from around the world came to see for themselves, the exceptional nature of the aggregation became clear – this just does not happen anywhere else in the world. A great story, no doubt... but if it were not for the tremendous efforts of some of those local Whyalla divers and nature's amazing capability to restore itself when we get out of the way, the chances are that it would now be significantly different story. In all probability the annual aggregation has been happening for hundreds, if not thousands, of years. The Giant Australian Cuttlefish is a short-lived

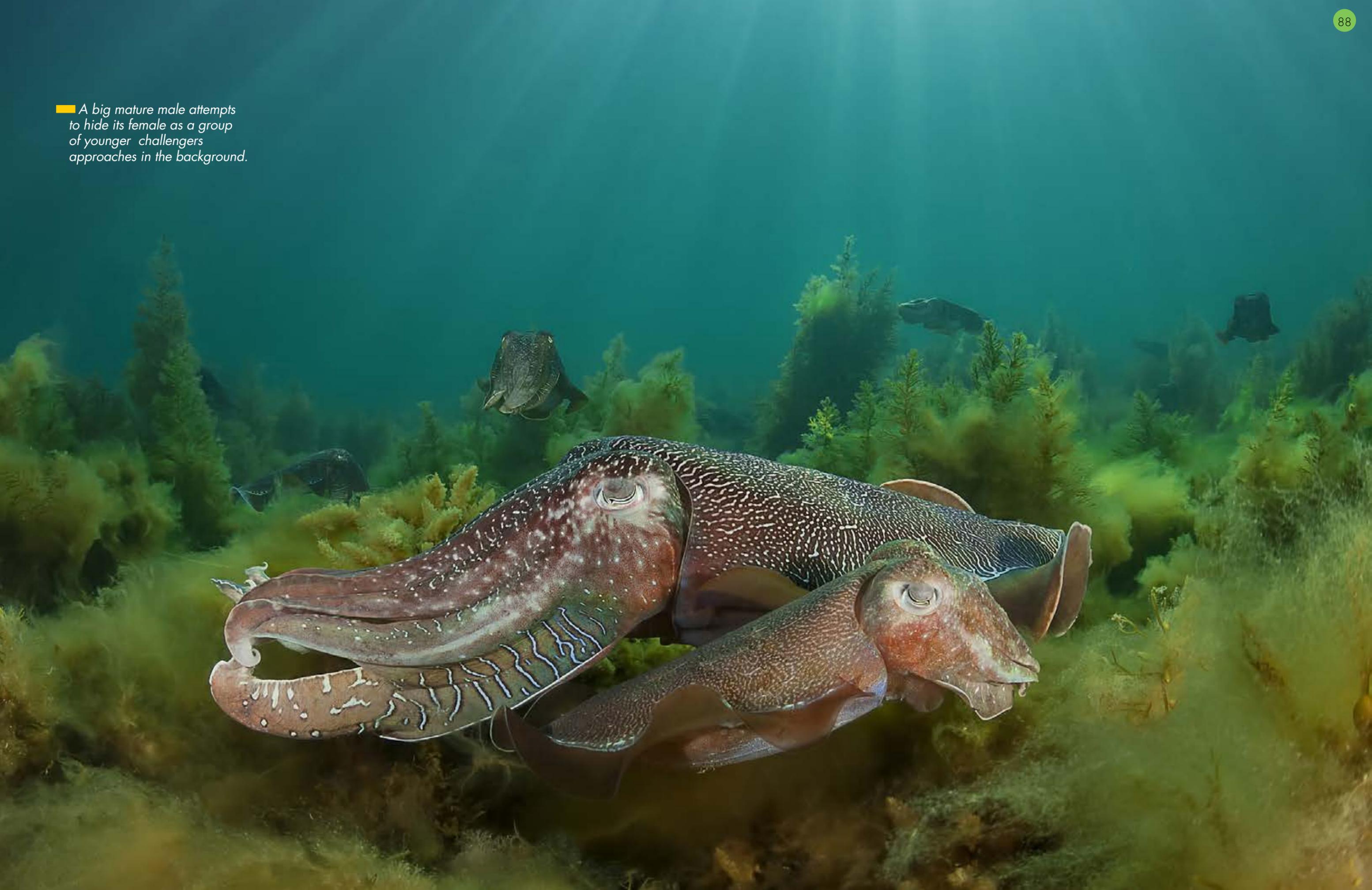




■ Another big mature male displaying its colours.

animal with a life-cycle of one to two years. It is also *semelparous*, which means it has a single reproductive episode and then dies, whereas us humans (and most animals) are *iteroparous* and are capable of multiple reproductive cycles over the course of our lives. The main aggregation area around Point Lowly and Black Point is perfectly suited for the purpose the cuttlefish have adopted it for - it is relatively sheltered and unlike much of the upper Spencer Gulf, which is mainly sand, sea grass flats and mud banks, there are numerous shallow rocky reefs which are perfect places for the females to hide their eggs. So, here is a species that has evolved and thrived in a very specific manner because it has the almost perfect location to ensure its propagation - then along comes Man... Things changed significantly for the Giant Australian Cuttlefish population of the upper Spencer Gulf back in 1997 when about 250,000 of them – roughly 250 tonnes – were taken during the annual aggregation by commercial fishermen for export to Southeast Asia. Up until 1997 there had been very limited recreational and commercial fishing of the cuttlefish, but so lucrative was the 1997 catch that the word spread, and in 1998 a much larger contingent of boats arrived in Whyalla even before the cuttlefish did. Within 4 weeks an estimated 150 tonnes of cuttlefish had been harvested and the stock was so devastated there was basically not much left to catch. After much local lobbying, the South Australian Primary Industries Minister

■ A big mature male attempts to hide its female as a group of younger challengers approaches in the background.





■ Courtship takes place under the watchful eyes of the competition, always ready to take advantage of the slightest chance to steal the female.



■ Finally, success!
A male and female Sepia apama caught in the process of mating.

stepped in and, in a widely applauded decision, closed the area to fishing until September 1998 and ordered a three-year assessment of the overall situation. In 1999 SARDI (South Australian Research and Development Institute) assessed the upper Spencer Gulf population at 182,585 and their subsequent surveys in 2000 and 2001 showed similar, but slightly less numbers. The next proper survey was in 2005 and then again in 2008 – which showed respective numbers of 127,785 and 75,295. SARDI commenced their surveys again in 2013 and recorded a total population of 13,492... meaning a 97% decline against the 1999 high of 182,585 – which in itself was recorded after the loss of about 400,000 cuttlefish because of the devastating harvesting in 1997 and 1998. Those terrible numbers in 2013 prompted a total ban on catching cuttlefish in the upper Spencer Gulf, and most interestingly the SARDI surveys of 2014 recorded a population of 57,317 in 2014 and 130,771 in 2015 - which would indicate that the total ban is working, but the total population is still well below where it was after the terrible events of 1997 and 1998. So for now at least, it looks it looks like the immediate danger may have passed, and we can thank the tremendous lobbying efforts of the local Whyalla diving community for that.

Photographing Giant Australian Cuttlefish *Sepia apama* at the annual aggregation in Whyalla is - for me - right up there with the best underwater photography experiences one can

have. There are very few places like this, where you can consistently get as close to the intense action that revolves around this unique event and yet be almost completely ignored as the cuttlefish focus on why they are there – sexual reproduction and the propagation of the species. The hardest part about getting good images at Whyalla during the aggregation is getting in and out of the water because of the rocky terrain – plus it has to be said that the water is quite cold. But the rest is relatively easy as the subject matter is all around you - like everywhere! If you have the time available, then there is a lot of potential for macro photography during the aggregation - such as close-ups of the cuttlefish eggs and their tiny contents. But if not, then concentrate on wide-angle and capture the ethos of the aggregation. ●

All the underwater images in this article were taken with Nikon cameras – a D300 DX format in a Subal housing on my first trip in 2010 and when I returned again in 2016 I was using a D800 FX format in a Nauticam housing. With the D300 I used the Tokina 10-17mm fish-eye zoom and with the D800 I used the Nikon 16-35mm rectilinear zoom.

For more information and insight on these wonderful creatures and the logistics of diving with them check out Don's Complete Guide to the Giant Australian Cuttlefish on Don's website, www.indopacificimages.com, which also has extensive location guides, articles and images on some of the best diving locations in the Indo-Pacific region.

■ A large male Giant Australian cuttlefish displaying its colours.



The end ■
of it all: broken
and battered,
exhausted
by fighting
and mating,
a cuttlefish
awaits death
just below the
surface of the
waters of
Whyalla.

