

# Leafy Sea Dragons





*These masters of camouflage are fierce predators—  
and one of the few species in which males become pregnant*

by Paul Groves  
Photographs by Paul Sutherland

**T**he water is clear, calm and dark. As I drop off the rear of the boat with my fellow divers into the icy water, a chill runs up my spine—both from the cold and from my growing sense of anticipation. We are night diving in the Southern Ocean off the southwestern coast of Australia, in search of creatures that sound almost mythical. We are hunting for dragons—

LEAFY SEA DRAGONS inhabit the waters off the southwestern coast of Australia. Full-grown adults can reach a length of 50 centimeters (nearly 20 inches). The dragons are close relatives of sea horses and pipefish—a family of animals characterized by the bony plates surrounding their bodies and by snouts that are tube-shaped. In addition, males of these species are the ones that become pregnant.

more precisely, leafy sea dragons. And for our breeding program at Underwater World Perth, we want to catch a male—a pregnant male.

The leafy sea dragon (*Phycodurus eques*) and its more common cousin, the weedy sea dragon (*Phyllopteryx taeniolatus*), are the only sea dragons in the world. Along with sea horses and pipefish, they are members of the family Syngnathidae, fish characterized by a hard external skeleton arranged as a series of rings around the animal's body and by a long tubular snout with no teeth. Sea dragons are distinctive in that frondlike appendages branch out from their armor-plated bodies. As befits their names, the leafy sea dragons' appendages are broader and flatter than the more stringy ones of the weedy dragons. Both creatures are endemic to the southern Australian coastline. The waters off the islands of the Archipelago of the Recherche where we are diving are a favorite haunt for sea dragons. These huge, sparsely vegetated granite islands are a refuge for an amazing array of exotic animals, some of them found nowhere else in the world. Beneath the waves, the vertical granite faces plunge for hundreds of meters into the inky depths.

As I continue my descent, a shoal of prehistoric-looking boarfish, each about half a meter long, drift by as if in some sort of trance. At 15 meters down (about 50 feet), my torchlight picks up an algae-encrusted rock. Near the kelp and sargassum algae on the rock, I turn to shine my beam back into the open water. Nothing—all is still and quiet. I'm relieved: great white sharks make their home in these waters as well.

Once I point the light back onto the rocks, I quickly forget about the danger that may be lurking and concentrate on my search. It is much easier to locate sea dragons, masters of camouflage, at night in the narrow focus of a torchlight than during the day, when the abundance of marine life is distracting. After several minutes of searching, I spot a sea dragon. Once my heartbeat returns to normal, I realize with dismay that the creature is only a weedy sea dragon.

After being submerged for an hour in the dark at 15 degrees Celsius (59 degrees Fahrenheit), my extremities are starting to go numb, and I am all but ready to give up. I decide to take one last look over a boulder ahead of me before returning to the surface for a nice hot shower. As I glide over the boulder, I suddenly spy what I came for: an adult male leafy sea dragon, roughly the size of a dinner plate, with a brood of eggs.

Sea dragons and their relatives in the Syngnathidae family are unique in the fish world in that the male carries and hatches the eggs on the outside of its body. The eggs on the male I found were well developed, at least three weeks old, fixed firmly into cuplike indentations on the underside of its tail and covered in algae. Scientists believe that this type of breeding behavior evolved to hide the eggs from would-be predators.

Fortunately, this male dragon was in a relatively shallow five meters of water. If it had been any deeper, we would have had to bring it up to the surface slowly, giving the creature time to adjust to the decreasing pressure. This decompression process can put so much stress on a dragon that its eggs will be lost.

With the dragon safely on shore, we rushed home. After a two-hour, specially chartered flight, we arrived at the quarantine facility at Underwater World Perth, the only aquarium in Australia that exhibits these amazing animals. Here we took all the usual precautions to prevent the dragon from becoming stressed. Even sudden changes in light can be fatal to a leafy. After a day, we placed in the tank some mysid shrimp, each only a few millimeters in length, and the dragon started feeding almost straightaway. Sea dragons mimic drifting seaweed so that they can ambush their mysid prey. They strike at mysids by quickly expanding a joint on the lower part of their snout, causing a suction force that draws the shrimp in.

After a week at the aquarium, the algae-encrusted eggs on the tail of the captured male began to hatch. First a small tail protruded from an egg, wriggling and squirming. A few twitches more and our first baby sea dragon appeared—a miniature replica of its parent. At birth, leafy sea dragons are around 20 millimeters (0.8 inch) long; when they reach



**SEA DRAGONS** blend in with their environment, making them difficult for predators to spot. Humans often have trouble as well—so divers hoping to see a dragon often dive at night, when the animals stand out better in the beam of a flashlight.



CARL ROESSLER/Sea Images

**PREGNANT MALES** carry the eggs for four to five weeks in cuplike indentations underneath their tails. Females initially produce the eggs but then transfer them to the male for fertilization, incubation and hatching. Little is known about the reproductive cycle of the leafy sea dragons. For instance, researchers are unsure how many times the sea dragons breed each year.



IKAN/Peter Arnold, Inc.

**YOUNG DRAGONS** hatch from the eggs with a small yolk sac attached. The sac supplies food for the first few days of life. The newborns can swim and hunt for food almost immediately.



maturity, between 12 and 18 months old, they can attain a length of 50 centimeters (nearly 20 inches). It took 10 days for all of the 210 eggs to hatch; in the wild, this feature would serve to distribute the newborn dragons over a wider area, offering them a better chance of finding food without having to compete with their siblings.

Unfortunately, we lost 10 of the tiny newborns to a filter intake in the tank, but the rest survived and seemed to thrive in their new home. After several weeks, though, we found there was no way we could supply enough mysids to continue feeding all 200 dragons, so we arranged to return most to the spot where we found their father. Chances of survival in the wild for these dragons would be much greater than for most—the first few weeks of a sea dragon's life are particularly perilous, as young dragons are common prey for other fish. Our infant dragons were much larger and less fragile than when they were first born. Indeed, the biggest threat to them now would most likely be storms washing them ashore. Typically, leafy sea dragons live about five to seven years.

### Mating Ritual

In 1997, two years after my frigid dive in the Archipelago of the Recherche, one of our juvenile leafy sea dragons, a female, became quite large in its abdominal area. In the preceding weeks, it had been spending a great deal of time side by side with one of our male leafys. The two had seldom been far apart from each other. The tail of the male also became swollen with fluid and wrinkled in appearance—a sure sign that mating was about to commence. In anticipation of what could be the first documented observation of sea dragons mating, I sat by with my video camera, watching intently.

Over the next several days, the two embraced in a delicate ballet, interlocking their leaflike appendages and ascending and descending in the water. They writhed left then right, up then down, in a sort of underwater wrestling match. Much to my delight, eggs soon began to appear from the abdomen of the female. But the moment was short-lived. The clusters of three to five bright orange eggs began dropping to the floor of the aquarium. Over about an hour, 150 of these eggs fell, without one hitting the tail of the male dragon.

Because no one has observed and recorded the successful transfer of unfertilized eggs from a female to a male for fertilization and incubation, we are not exactly sure how this process is supposed to occur. But it is safe to say that something went wrong this time. Perhaps the presence of the other sea dragons in the aquarium distracted the couple. We were surprised to see that after depositing its eggs, the female dragon appeared totally exhausted, floating

motionless on the surface. By the next day, however, she began swimming and feeding again.

Happily, one pair in our aquarium now seems to be preparing to breed, so I will set up my video camera once more and hope for success. Our goal for the breeding program at Underwater World is to be able to maintain our own population of leafys without harvesting from the wild. When feasible, we plan to return young hatched in captivity to the wild (to date, we have been able to do this twice). And of course, we would like to learn more about these beautiful and unusual creatures—about their entire reproductive cycle, for instance, as well as about their biology in general. Should the numbers of wild sea dragons begin to fall, perhaps we will be able to help repopulate the area.

To stave off such a fall in numbers, however, several years ago Underwater World successfully campaigned to have the Australian government designate leafy sea dragons as a protected species. Now all Syngnathidae are being proposed for recognition by the Convention of International Trade in Endangered Species (CITES) Treaty. Under current Australian law (in effect only during this past year), Syngnathidae cannot be taken from the country without a special export permit from the government. And only specimens that have been bred in captivity or collected under an approved program will be considered for export.

Such laws should stop many Australian Syngnathidae from winding up as curios in novelty shops or as alleged aphrodisiacs in the herbal medicine trade in Asia. Improved tracking of the sea dragons sent to public and private aquariums should protect the creatures as well. Many aquariums would like to own leafy sea dragons—one reputedly sold for about U.S.\$4,800 in Japan. Unfortunately, though, they are extremely difficult to care for in captivity, and many die once taken from the wild. Globally, sea dragons and other Syngnathidae are under threat not only from fishers but also from the effects of pollution and overfishing for other animals (Syngnathidae are often captured as bycatch in trawling nets).

In addition, Underwater World Perth helped to set up the Western Australian branch of Dragon Search, a joint program of various government departments and community groups throughout Australia. Initially the goal of Dragon Search was to monitor wild populations of leafy sea dragons, but now it monitors sea horses and pipefish as well. As part of an ongoing preservation effort, we hope to learn more about these animals—where they live and how large the populations are—by compiling reports from divers, fishers and beachcombers who find the creatures washed ashore. There is still much to learn about these magnificent animals, and we have only just begun. SA

Sea  
dragons  
mimic  
drifting  
seaweed  
so that  
they can  
ambush  
their  
prey



**ANIMAL OR VEGETABLE?** Sea dragons are masters of camouflage, often resembling quietly drifting seaweed. This tactic enables them to sneak up on prey. The dragons mostly eat tiny mysid shrimp. If camouflage fails to protect them from predators (such as sharks or larger fish), leafy sea dragons will sometimes try to deflect attack with the help of several long, sharp spines along their bodies.

WEEDY SEA DRAGONS, a more common type of dragon, have fewer appendages than their herbaceous cousins but are roughly the same size as the leafy dragons. Males of the species carry the eggs for about four to five weeks during the summer months. Weedy sea dragons inhabit the waters of the southern coast of Australia.



KELVIN AITKEN Peter Arnold, Inc.

---

### *The Author*

PAUL GROVES has been head aquarist at Underwater World Perth in Western Australia for three and a half years. He has worked with a full range of fishes, including sea dragons, sea horses, subantarctic fish, jellyfish and coral reef animals. With more than 10 years of diving experience, Groves hopes to re-create the oceans of Australia for nondivers and to contribute to the general conservation of ocean life.

### *Further Reading*

DRAGONS OF THE DEEP. Paul Zahl in *National Geographic*, Vol. 153, No. 6, pages 838–845; June 1978.  
AUSTRALIAN SEA LIFE, SOUTH OF 30 DEGREES. Neville Coleman. Doubleday, 1987.  
COASTAL FISHES OF SOUTH EASTERN AUSTRALIA. Rudie H. Kuiter. University of Hawaii Press, 1993.  
Dragon Search Web site is available at [www.nexus.edu.au/schools/Kingscot/Pelican/Seadragon/Sd\\_index.htm](http://www.nexus.edu.au/schools/Kingscot/Pelican/Seadragon/Sd_index.htm) on the World Wide Web.  
Underwater World Perth Web site is available at [www.coralworld.com/perth](http://www.coralworld.com/perth) on the World Wide Web.

---