

Case study

Phycodurus eques

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| Species: | <i>Phycodurus eques</i> (Günther, 1865) |
| Common Name: | Leafy Seadragon |
| Class: | ACTINOPTERYGII |
| Order: | GASTEROSTEIFORMES |
| Family: | SYNGNATHIDAE |



Range:

Leafy Seadragons are endemic to Australia and are most abundant in South Australia (SA) and southern Western Australia (WA). Until recently, the range was considered to form a continuous stretch of coastline from near Perth on the southern west coast of WA to Wilson's Promontory in Victoria. Recent sightings of live animals by divers have extended the known range along the WA coastline as far north as the Abrolhos Islands, west of Geraldton. There are also unconfirmed reports of the species around the Bass Strait Islands of northwest Tasmania.

The length of coastline along which the species occurs is approximately 14,000 km and the width of the strip of habitat suitable for it to occupy along this coastline is on average around 0.1 km. Seadragons have been sighted at numerous locations within the range but it is impossible to determine how fragmented the population is. The depth range of leafy seadragons is not well documented; most sightings are by divers in waters of less than about 20 m, however seadragons have been recorded down to 30 m in some areas.

Population:

There are no direct data for population estimates for *P. eques*. However, the density of leafy seadragons around West Island, in Encounter Bay (SA) based on a mark/re-sighting method and a capture/recapture algorithm indicates that the density of larger juveniles and adults at this site at 57 fish per ha. Since this study site was chosen because of relatively frequent sightings of the species, it can be assumed that densities elsewhere in the range would be lower. So, taking just 10% of this estimate (5 fish per ha), and a total range area of 1,400 km² (140,000 ha), the total global population estimate would be approximately 700,000 (based on quite loose assumptions).

Habitat & Ecology:

Leafy seadragons were, until recently, thought to occur predominantly near rocky reefs supporting stands of kelp or other macroalgae, where they have been observed feeding on mysids and other crustaceans. However, more recent data has shown that this species is just as prevalent over shallow (5 to 15 m depth) *Posidonia* seagrass meadows and patches of sand amongst seagrass.

Individuals typically remain within well-defined home ranges of up to 5 ha. As with other syngnathids, male seadragons carry the fertilized eggs. For Leafy Seadragons, the male carries about 200 eggs on the exposed surface of the underside of its tail (there is no pouch). It can survive for at least two to three years in aquaria if supplied with its specific live food requirements. Longevity *in situ* is not known. Mating reportedly occurs during summer months. The genetic structure of populations has not been measured, nor has any aspect of reproduction been quantified.

Phycodurus eques is particularly well camouflaged, with a number of frond-like appendages that resemble kelp. The species also rocks back and forth with wave action, increasing its resemblance to coastal algae swept by coastal surge.

Threats:

Leafy Seadragons lack a caudal fin and are weak swimmers; in conjunction with a lack of a dispersive egg phase, this potentially makes them vulnerable to habitat loss and degradation as well as to incidental harvesting during commercial fishing. These are the two main threats. The species is associated with seagrass beds and reefs supporting macroalgae. These habitats have been adversely affected by human activities and loss in quality and quantity of habitat has been documented. The loss of habitat is most severe near major urban centres, where discharge of storm water and treated sewage leads to eutrophication and increased sedimentation. Losses of seagrass have been particularly severe along the metropolitan coasts.

There is anecdotal evidence that leafy seadragons are killed as incidental bycatch in the trawling industry in SA. Fishers have indicated that on occasions they catch "large numbers" of the species. However neither the rate nor distribution of incidental catch have been substantiated.

The current legal collection of wild specimens is unlikely to cause long-term changes in population sizes. The small numbers taken under legally issued permits could result in the reduction or loss of groups of animals at particular sites, but this is unlikely to result in measurable effects on regional populations. If demand increases substantially, illegal collection could threaten local and perhaps regional populations, although this possibility should remain unlikely given the difficulties associated with illegal international export.

This species is a major attraction for the dive industry in southern Australia, and it has been made the official fish emblem in South Australia. Recreational divers often harass or disturb individuals. Suitable protocols for divers should be encouraged to protect local populations, but the disturbance probably does not harm the long-term prospects for regional populations.

Conservation Measures:

The species is protected species in South Australia, Victoria, and Western Australia Waters. It is subject to export controls in the Commonwealth Wildlife Protection (Regulation of Exports and Imports) Act 1982 and is listed under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

All states of Australia are currently implementing systematic series of Marine Protected Areas (MPAs). The most important development for Leafy Seadragons is that a new MPA is close to being declared (it was released as a draft plan earlier in 2005) in southern Gulf St Vincent in the state of SA. The proposed MPA will include areas (e.g., Encounter Bay and northeastern Kangaroo Island) in which a large proportion of public sightings of seadragons occur. The protection of these areas could substantially decrease the perceived vulnerability of the species to human activities, in particular to commercial fishing.

Sources:

Connolly, R. 2006. *Phycodurus eques*. In: IUCN 2006. 2006 IUCN Red List of Threatened Species. <www.iucnredlist.org>. Downloaded on 15 June 2007