

Marine Slug – *Smeagol hilaris*

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Aquatic Ecosystems Unit, Port Stephens Fisheries Institute



Figure 1: *Smeagol hilaris* (Photo: W. Ponder)

Introduction

Smeagol hilaris, also known as the 'blind slug' is one of five species of marine slug in the genus *Smeagol* known only from Australia and New Zealand. *Smeagol hilaris* has only been collected from a small isolated location at Merry Beach, south of Ulladulla, New South Wales, Australia.

Smeagol hilaris is listed as a **critically endangered species** in NSW. There are heavy penalties for harming, possessing, buying or selling them, or for damaging their habitat (see 'Legal implications').

Description

Smeagol hilaris is a small marine pulmonate gastropod; a type of mollusc. Pulmonate refers to their ability to breathe air through lungs as opposed to gills.

They are a translucent white in colour resembling a fly maggot, with some of the internal organs visible through the exterior surface. Most specimens found have been 5 – 6 mm long.

Smeagol hilaris lay eggs and their young are thought to be direct developers; meaning the embryos form into a small slug within the egg capsule prior to hatching, with no larval stage.

There is currently limited information on the seasonality of their breeding, reproductive biology or life span, although they are hermaphrodites.

Climo (1980) first described the *Smeagol* genus from a new species - *Smeagol manningi* that is endemic to New Zealand. The genus was named after the pallid, sometimes subterranean character Smeagol who played a significant role in Tolkien's Lord of the Rings books. Climo (1980) considered the genus to be more significant phylogenetically than their drab exterior suggested and hence the analogy.

Habitat and ecology

- All species in the *Smeagol* genus are restricted to the upper littoral zone of very small areas of gravel or cobble beaches in south-eastern Australia and New Zealand.
- *Smeagol hilaris* clings to the underside of boulders and large cobbles embedded in gravel in basalt gutters. Individuals collected to date have been found in permanently shaded areas just below the high tide level.
- *Smeagol hilaris* is considered to be a narrow-range endemic and its limited distribution and abundance probably reflects long isolation and limited habitat availability rather than human-induced decline.
- Gravel and cobble beaches are considered greatly restricted and extremely discontinuous in south-eastern Australia.

Why is the Marine Slug threatened?

- *Smeagol hilaris* found on Merry Beach may be negatively impacted by a range of human activities.
- Oil spills have the potential to greatly affect their habitat. Two Victorian species of *Smeagol* were thought to have been significantly impacted by an oil spill at Phillip Island.

- Habitat damage and/or alteration due to development and urbanisation in nearby areas, particularly storm water run-off from adjacent roads and built environments.
- Increased human impacts on the beach and surrounding habitat, including the collection of animals for food or bait, pesticide inputs, climate change and invasive species.

Conservation and recovery actions

- Monitor the status of the known population of *Smeagol hilaris* to assess trends in abundance and distribution and to identify emerging threatening processes.
- Ensure that all relevant stakeholders take the species into consideration during development assessment procedures.
- Educate the public on the existence of *Smeagol hilaris* and ways to minimise impacts on the species.
- Protect the few remaining sites that contain or with the potential to support the species.
- Report any sightings of the species on the NSW DPI 24 hour automated message-taking service by calling (02) 4916 3877.
- A full list of strategies to be adopted for promoting the recovery of *Smeagol hilaris* is set out in the NSW DPI Priorities Action Statement:
www.dpi.nsw.gov.au/fisheries/species-protection

Legal implications

It is illegal to catch and keep, buy, sell, possess or harm *Smeagol hilaris* (or any other threatened species in NSW) without a specific permit, licence or other appropriate approval, and significant penalties apply. For critically endangered species these penalties can include fines of up to \$220,000 and up to 2 years in prison. There can also be significant penalties for causing damage to the habitat of a threatened species without approval through actions such as dredging, digging for bait or removing sand, gravel or cobbles from Merry Beach.

The impact of developments or activities that require consent or approval (in accordance with the *Environmental Planning and Assessment Act 1979*) must be assessed and considered by consent or determining authorities. Where such actions are likely to result in a significant impact on a threatened species or its habitat, a detailed species impact statement must be prepared.

Strategies to be adopted for promoting the recovery of the *Smeagol hilaris* to a position of viability in nature are set out in the NSW DPI Priorities Action Statement.

A recovery plan may be prepared in accordance with the provisions of the *Fisheries Management Act 1994* to promote the recovery of the species to a position of viability in nature.

Bibliography and further reading

Climo F. M. (1980) *Smeagolida*, a new order of gymnomorph mollusc from New Zealand based on a new genus and species. *New Zealand Journal of Zoology* **7**: 513–522.

Ponder W. F. (2004) Narrow range endemism in the sea and its implications for conservation. *Australian Zoologist*. pp. 89-102. In *Conserving Marine Environments* (ed. P. Hutchings and D. Lunney), Royal Zoological Society of NSW, Mosman.

Tillier S. & Ponder W. F. (1992) New species of *Smeagol* from Australia and New Zealand, with a discussion of the affinities of the genus (Gastropoda: Pulmonata). *Journal of Molluscan Studies* **58**: 135–155.

For further information

See the NSW DPI website: www.dpi.nsw.gov.au

Contact the NSW DPI Threatened Species Unit:
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Figure 2: Cobble and gravel filled gutters are a vital habitat for *Smeagol hilaris* (Photo: T. Daly)