

DPI Primefact

Lord Howe Abalone – *Haliotis rubiginosa*

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Threatened Species Unit

Introduction

The Lord Howe Abalone (*Haliotis rubiginosa*) is a small abalone species (Fig 1) that is endemic to the shallow waters of Lord Howe Island Marine Park. It is a rare and cryptic species that hides under rocks and pieces of dead coral, and in small holes and crevices in the reef.



Figure 1. *Haliotis rubiginosa* (Photo: Justin Gilligan).

In NSW, the Lord Howe Abalone is listed as a **critically endangered species**. There are heavy penalties for harming, possessing, buying or selling them, or for harming their habitat (see 'Legal Implications').

Description

The Lord Howe Abalone has a large muscular foot for attachment to the substrate (Fig 2).

The foot is circled by the mantle and epipodium which bears sensory tentacles and projects beyond the shell edge when the animal is active. The animal has a lobed head with a pair of light receptors on the end of well-developed eye stalks and a pair of long sensory cephalic tentacles.

The foot of this species is cream coloured, the mantle, head and cephalic tentacles are lime green, and the end of the eye stalks are red. The epipodium is frilled with brown, white and pale pink banding (Fig 3). The size of *Haliotis rubiginosa* shells varies, with maximum shell length up to 56 mm (Fig 4). The ovate shell is convex and depressed, sculptured with wrinkles and spiral ridges. The ridges are obtusely scaled, with a row of six open perforations (respiratory pores, called 'tremata') which are imperfectly formed.



Figure 2. Underside of *Haliotis rubiginosa*. (Photo: Justin Gilligan).



Figure 3. Foot, mantle and frilled epipodium of *Haliotis rubiginosa*. (Photo: Justin Gilligan).



Figure 4. Shells of *Haliotis rubiginosa*. (Photo: Justin Gilligan).

Habitat and ecology

The species occurrence is restricted to carbonate reefs in the Lord Howe Island Marine Park, from the intertidal to shallow subtidal (Fig 5). It has been observed to depths of 10 m living under boulders and rubble, and in holes and crevices.

Abalone species are herbivorous with preference for red or brown algae, which they graze on using a radula (a toothed, chitinous ribbon). They are primarily nocturnal feeders. The specific diet of *Haliotis rubiginosa* is unknown, but may include species of coralline

and turfing algae on intertidal and shallow subtidal reefs around Lord Howe Island.

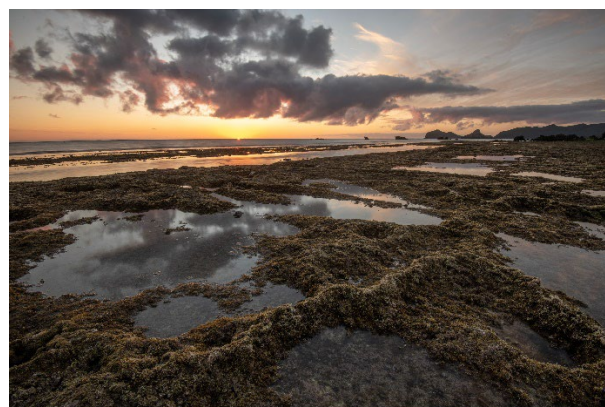


Figure 5. Carbonate reef at Lord Howe Island where *Haliotis rubiginosa* occurs (Photo Justin Gilligan).

Abalone are severe haemophiliacs meaning their blood does not clot and any tissue damage can result in death from blood loss. This aspect of their biology makes them vulnerable to direct physical disturbance. When physically disturbed, Lord Howe abalone releases white mucous from exhalant shell pores. Data on the population demographics, biology including diet and reproduction, and other ecological considerations for this species are not reported in the literature.

Why is the Lord Howe Abalone threatened?

The principal threats to this species are marine heatwaves driven by climate change. Prolonged exposure to elevated water temperatures can compromise immune responses in abalone, and also impact reproductive output. Ocean acidification linked to climate change can also inhibit juvenile survival.

Adult abalone must be in close proximity to successfully reproduce (the allee effect).

Therefore, impacts which reduce population densities below a critical threshold have the potential to cause recruitment failure and trigger further rapid population declines.

As the species has a highly restricted range (Lord Howe Island), the population is therefore highly susceptible to the increased frequency and severity of marine heatwaves occurring in these waters.

Conservation and recovery actions

- Implement targeted surveys to assess and map the current distribution of Lord Howe Abalone.
- Undertake quantitative density assessments in habitats occupied by Lord Howe Abalone to establish critical monitoring baselines.
- Undertake qualitative assessments of habitat occupied by Lord Howe Abalone to help inform microhabitat and diet requirements.
- Develop standard monitoring protocols for subtidal and intertidal populations to assess temporal trends.
- The continued implementation of comprehensive and adequate no-take areas incorporating Lord Howe Abalone habitat to ensure effective ecosystem function and resilience against climate change.
- Local management actions should be implemented to help mitigate impacts from anthropogenic changes in hydrology/ water/sediment flow in nearshore environments, that may result in unfavourable conditions for Lord Howe Abalone.
- Develop emergency response actions for the Lord Howe Abalone and incorporate this information into local marine heat wave response plans.
- Targeted education and advisory initiatives to increase public appreciation and awareness of the conservation status of the Lord Howe Abalone.
- Initiate research to assess the biology of the species, including diet and other ecological considerations.
- Investigate potential for a captive breeding program to help restock the population and to safeguard this species from extinction.
- Assess adaptability and resilience of Lord Howe Abalone to increasing water temperatures and acidity using aquaria experiments on closely related species.
- Report any sightings of the species via the NSW DPI online form: www.dpi.nsw.gov.au/fisheries/species-protection/report-it

Legal Implications

It is illegal to catch and keep, buy, sell, possess or harm Lord Howe Abalone (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 two years in prison.

There can also be significant penalties for causing damage to the habitat of a threatened species without approval. The impacts 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 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 Lord Howe Abalone must be set out in the NSW DPI Priorities Action Statement.

Bibliography and further reading

Fisheries Scientific Committee (2024) Final Determination *Haliotis rubiginosa* available online at: <https://www.dpi.nsw.gov.au/fishing/species-protection/fsc/final/Haliotis-rubiginosa-Lord-Howe-Abalone-Final-Determination.pdf>

Peters, H. & Woods, C.L. 2022. *Haliotis rubiginosa* (amended version of 2021 assessment). The IUCN Red List of Threatened Species 2022.

For further information

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

Contact the NSW DPI Threatened Species Unit:

Locked Bag 1, Nelson Bay, NSW, 2315

Email:

fisheries.threatenedspecies@dpi.nsw.gov.au

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The information contained in this publication is based on knowledge and understanding at the time of writing (May, 2024). However, because of advances in knowledge, users are reminded of the need to ensure that the information upon which they rely is up to date and to check the currency of the

information with the appropriate officer of the Regional NSW or the user's independent adviser.



Figure 6. *Haliotis rubiginosa*. (Photo: David Harasti).
