



The Life of a Southern Rock Lobster

Introduction

When we think of rock lobsters it is usually associated with enjoying its exquisite premium dining qualities for which the Australian Southern Rock Lobster is internationally recognised, regarded as “the finest in the world”. On its journey to becoming a world class culinary treat the commercial fishing industry has invested heavily in research to understand the life cycle and reproduction of the Southern Rock Lobster - understanding the biology of this highly prized crustacean is important in managing the rock lobster population, or ‘stock’, sustainably.

A species of the rock lobster family, the Southern Rock Lobster (*Jasus edwardsii*) requires reef habitat to call home and preferably with an abundance of kelp and crevices to provide cover and favourite sources of food.

In Australia, Southern Rock Lobster can be found around southern New South Wales, Victoria, Tasmania, South Australia and the southern coast of Western Australia. The only other place they are found in the world is in New Zealand although there are many other species of rock lobsters around the world in both tropical and cooler waters. Southern Rock Lobster that set up home in shallow water are mostly reddish-purple while those that live in deeper, offshore waters tend to be stronger purple to creamy yellow in colour.

Lobster Groups

Lobsters are large crustaceans and can belong to two groups, one having claws (pincers) on their front legs and those that do not. Clawed lobsters are usually referred to as ‘clawed lobsters’ and those without claws as ‘rock lobsters’. There are no ‘clawed lobsters’ found in Australia – these are confined to North America and Western Europe. Freshwater yabbies and crayfish, which live in rivers and lakes throughout Australia resemble clawed lobsters but belong to a very different group of crustaceans and are not ‘lobsters’. All Australian saltwater lobsters species, including Southern Rock Lobsters, do not have pincers on their legs and are therefore ‘rock lobsters’. Rock lobsters have long spines (horns) projecting forward from the front of the head whereas ‘clawed lobsters’ do not have these. Refer to **Figure 1** for all the key body parts of a Southern Rock Lobster

Body Plan

The image below provides the names of the key parts that make up the body of a Southern Rock Lobster.

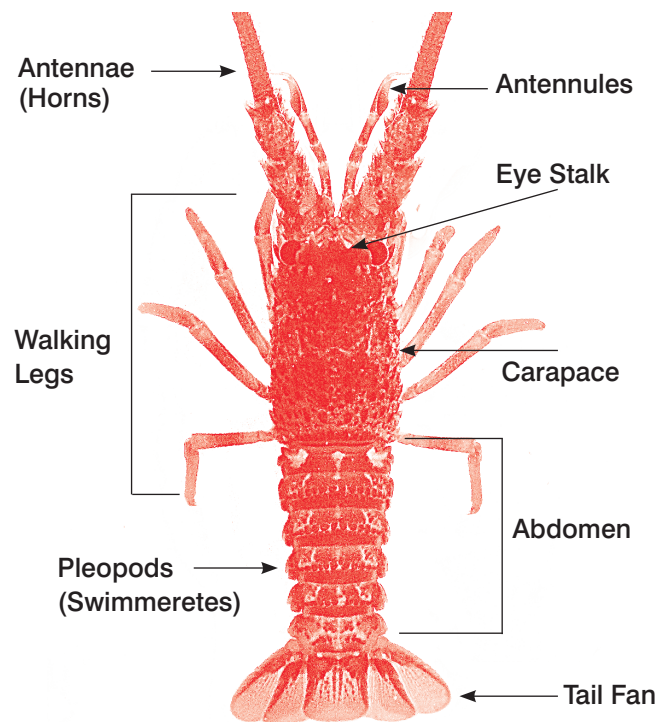


Figure 1

Australian Southern Rock Lobster is internationally recognised, regarded as “the finest in the world”

Reproduction

From a tiny egg being carried under the tail of a female lobster to a mature sized adult involves a long and complex journey in both time and distance.

Mating usually occurs in April to July when the male transfers a packet of sperm to the female which is attached to the underside of the body between the last pair of legs. Straight after mating the female begins to spawn eggs through openings at the bases of the third pair of walking legs with fertilization occurring externally.

Depending on the age and size of a female lobster the fertilized eggs can number anywhere from 100,000 up to 1,000,000 and are attached to the pleopods, or swimmerets, under the tail of the female. The female rock lobster carries these eggs for 4-6 months. The female lobster is referred to as 'in berry' or 'berried' during this time and cannot be harvested by commercial or recreational fishermen in any State.

The eggs eventually hatch and metamorphose into larvae and begin their complex journey to become a juvenile lobster at an unknown destination in 9-24 months time. The first stage after hatching only lasts a few hours and is called the naupliosoma. These larvae are active swimmers that make their way to the surface of the ocean where they reach the next stage termed phyllosoma larvae.

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The ocean currents disperse the phyllosoma larvae widely and this phase can last between 12 and 24 months. This stage is spent far out to sea beyond the continental shelf so ocean currents can carry phyllosoma hundreds or even thousands of kilometers from where it left the female lobster. At the end of this phase of being carried by the ocean currents phyllosoma larvae moult and metamorphose into a puerulus larvae. Refer to **Figure 2** for an overview of the life cycle for a Rock Lobster.

Puerulus larvae are transparent, resembling miniature lobsters in shape but still live in the water column. They can swim forwards and travel up and down in the water column coming near to the surface at night and swimming deeper in the daytime. The puerulus don't feed and their job is to travel from the deep ocean areas into the coastal reef where they'll live as an adult lobster. They swim towards shore at night and the fortunate ones eventually

Figure 2

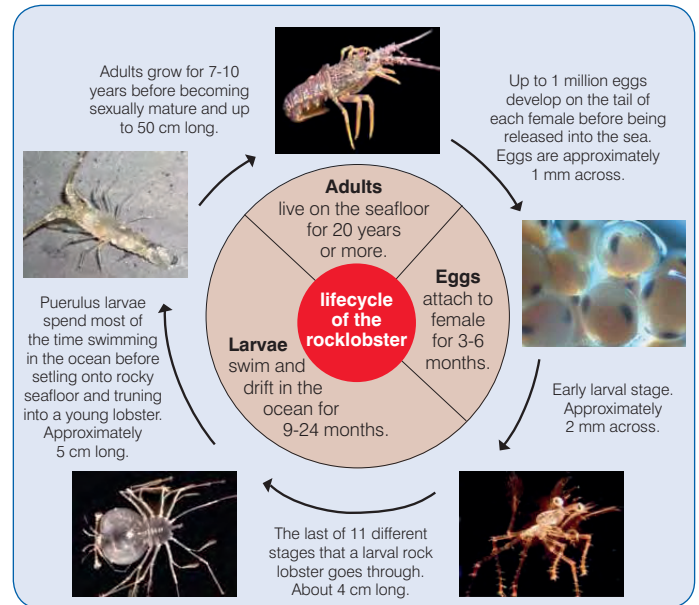


Figure 3



find reef habitat. Finding reef triggers them to moult again turning at last into pigmented juvenile lobsters that live on the bottom and look identical to adults. Refer to **Figure 3** for a pigmented juvenile lobster.

This settlement of puerulus is very important and is monitored using specifically designed collectors placed in many locations around southern Australia. Only a very small number of the naupliosoma larva released actually reach the stage of settling as puerulus – and very few of these puerulus survive to become adults. By measuring the annual settlement of puerulus, fisheries scientists gain an indicator of future stock levels. From settling on the reef area as a puerulus, growth rate is slow because of the cool waters in which the rock lobsters live. Growth is also variable between regions so that it takes at least three years but sometimes more than 10-years to reach the legal minimum size a lobster can be harvested at. Being able to get advance information on changes in lobster stocks based on puerulus settlement helps in managing lobster stocks sustainably.

Adult Southern Rock Lobster

Once the puerulus has settled they tend to stay in the same region although this varies with more movement in some areas than others. Some Southern Rock Lobsters have been tagged and recorded moving more than 80 kilometers and from inshore to deeper offshore reefs. However monitoring in many locations has indicated there is more typically little movement by adult Southern Rock Lobsters. **Figure 4** - A Southern Rock Lobster at home on its ledge on a reef off the coast of Tasmania.

Southern Rock Lobster are mature enough to start breeding when their carapace length is 60-70 mm long and are able to breed before reaching the minimum legal size in most parts of the fishery. They have been known to live beyond 20 years of age with carapaces growing up to 23 cm in length and weighing in excess of 10 kg.

Feeding mostly at night Southern Rock Lobsters are omnivores eating bottom dwelling invertebrates such as mussels and abalone (molluscs), crustaceans (crabs), sea urchins (echinoderms), worms and algae (seaweed).

Of course Southern Rock Lobsters are more than popular fare with not just us humans, but also have many underwater predators such as sharks, octopus and reef fish species like wrasse and ling.

Adult lobsters also shed their shells once or sometimes twice per year and this is referred to as moulting and is the way a lobster grows.

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There are several physical characteristics that distinguish male and female rock lobsters; the fifth walking legs (counting from the front to the back) on the female ends in a small claw, which is used to clean and tend the eggs when she is carrying them. The males do not have this claw. The pleopods (swimmerets) under the lobster's back tail also differ with the male having four pairs of single swimmerets whereas the female has swimmerets divided into inner and outer lobes that are larger and used to carry eggs. Refer to **Figure 5** for a "berried" female lobster with eggs.

Figure 4



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Figure 5



Acknowledgements:

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Figure 2 – Pecl G, Frusher S, Gardner C, Haward M, Hobday A, Jennings S, Nursey-Bray M, Punt A, Revill H, van Putten I (2009). The east coast Tasmanian rock lobster fishery – vulnerability to climate change impacts and adaptation response options. Report to the Department of Climate Change, Australia

Figure 3 – National Institute of Water and Atmospheric Research – New Zealand

Figure 4 – Ivan Hinojosa

Figure 5 – Primary Industries and Regions SA