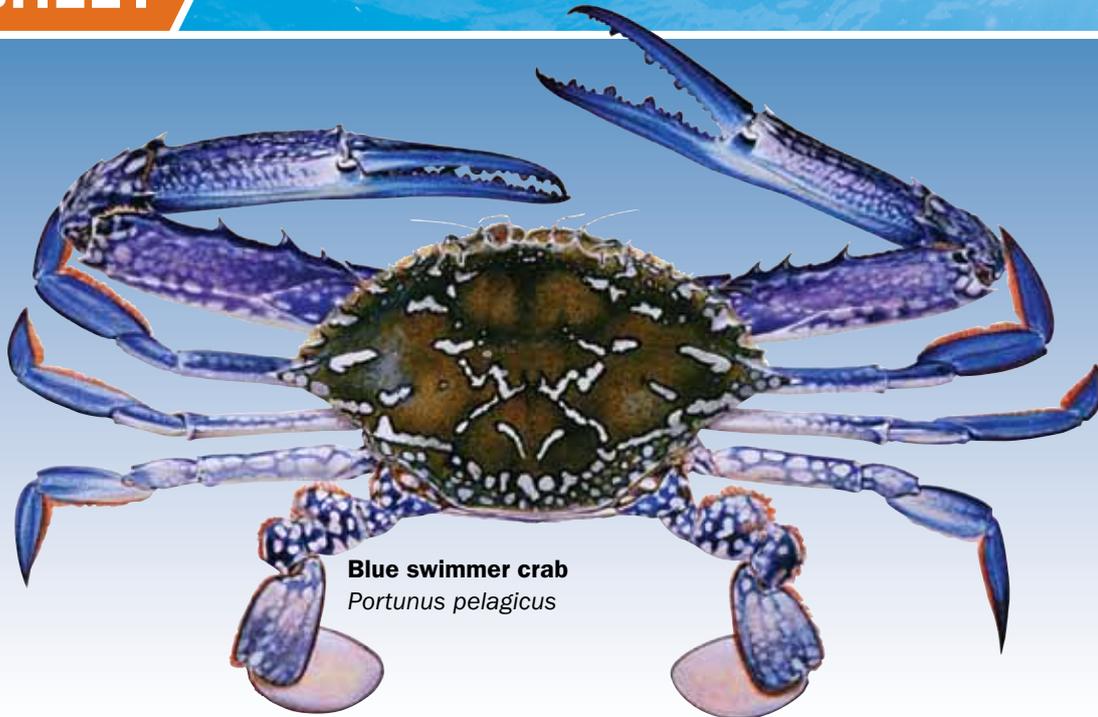




FISHERIES FACT SHEET

BLUE SWIMMER CRAB



Blue swimmer crab
Portunus pelagicus

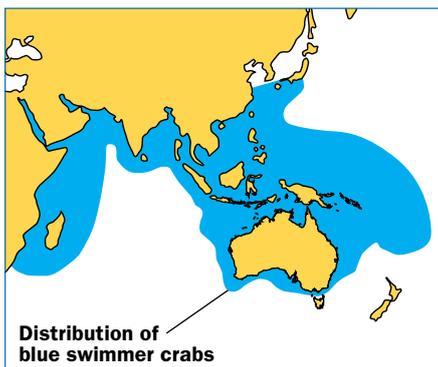
All about blueys

A powerful swimmer and voracious hunter and scavenger, the blue swimmer crab is also a dinner table favourite.

Distribution

A tropical species, blue swimmer crabs are found in estuaries and inshore marine waters, mainly between Nickol Bay and Dunsborough.

They are also found off northern and eastern Australia and are widely distributed in the Indian and Pacific oceans, including the east coast of Africa and southern Japan. They have even been found in the Mediterranean Sea, having entered via the Suez Canal.



Major blue swimmer crab populations in WA



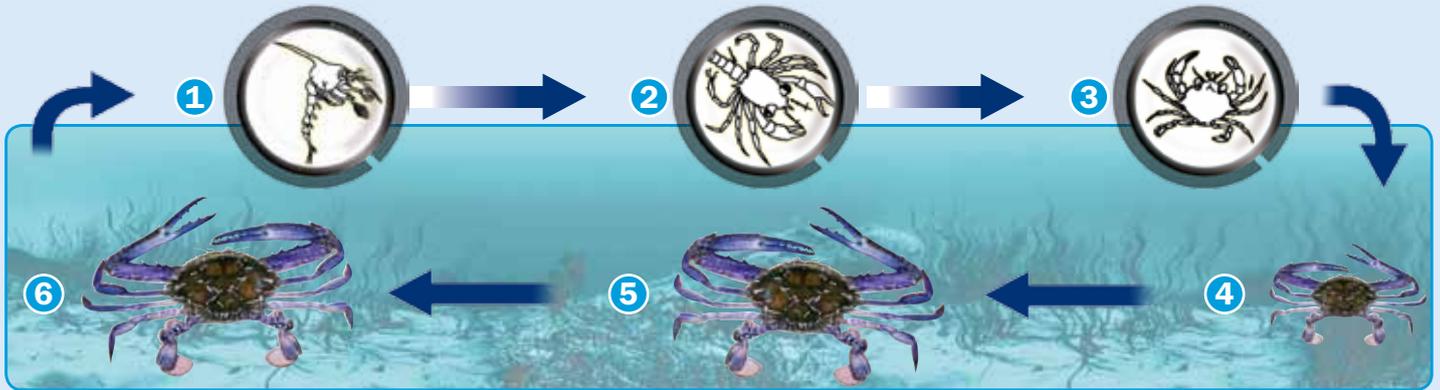
A big family

Blue swimmer crabs are sometimes called 'blue manna'. In WA, they can grow to have a carapace up to 25 centimetres wide and a claw span up to 80 centimetres. The biggest blue swimmer crab caught in WA weighed more than a kilogram.

These crabs belong to the Portunidae family, which also includes other large, edible crabs found in Australia such as mud crabs. Crabs from this family can usually be recognised by their flat, disc-shaped hind legs, used as paddles for swimming and by the nine spikes, called horns, along their carapace, either side of their eyes.

Life cycle

The timing and movements of blue swimmer crabs vary between locations. Estuarine crabs, such as those living in the Leschenault Inlet, Peel-Harvey Estuary and Swan River, tend to move from estuaries into nearby marine waters during winter. Crabs in marine embayments such as Cockburn Sound and Shark Bay spend their entire lives within different parts of the embayment.



1. Zoea: Blue swimmer crabs begin life as tiny larvae, called 'zoea'. Zoea grow and change shape over a four-to-six-week period during early summer. Zoea are poor swimmers and drift with the wind and tides, either within embayments or along the coast up to 80 kilometres out to sea. They have a very high death rate and may be preyed upon by fish and sea jellies. Only a few will reach shallow nursery areas by late summer and autumn.

2. Megalopae: Zoea that successfully settle in shallow nursery areas moult frequently and rapidly grow in weight and size. They turn into a more crab-like state called 'megalopae' and are about the size of a 10 cent coin. Megalopae live on the sea or estuary bottom. With each moult, they may increase in weight by up to 80 per cent and expand their carapace by up to 20 per cent.

3. Juvenile crabs: By autumn, most megalopae have formed into juvenile crabs with a recognisable crab shape and carapace three to six centimetres wide. They continue growing rapidly.

4. Young adults: By winter, most of the young crabs have matured and their carapace is about nine centimetres wide. During this final moult to reach maturity, female crabs mate with a male for the first time. The newly-matured estuarine crabs are likely to follow older adults to the mouth of estuaries or just outside them to avoid freshwater flows caused by run-off and rain.

5. Mating: Most blue swimmer crabs mate in autumn. The males moult first, so that their shells have hardened beforehand. A courting male then catches a female and carries her beneath him for four to 10 days while fending off other males. The male helps the female to moult and then turns her over to mate while she is still soft-shelled. After mating, he continues to carry her around and protect her for another three-to-four days while her



Mating crabs.

shell hardens. A male may mate with several females during one season.

The female crabs retain the males' sperm over winter until their ovaries develop – helped, it is thought, by the rising water temperature in spring.

6. Spawning and berried females: In the ocean, big females mostly spawn in late spring and early summer. Estuarine crabs tend to spawn later in summer, having moved to the sea or the estuary mouth during the winter rains. Each female produces a huge amount of eggs – between 180,000 and two million in a single spawning – and may spawn more than once in a season! However most of the larvae from these eggs will not survive to become adult crabs.



A berried female blue swimmer crab.

The eggs are fertilised by the stored sperm and, when laid, they attach to hairs in a spongy mass under the female's abdomen. The eggs go from orange to black as they mature. The term for a female crab carrying egg clusters in this way is 'berried'. Any berried females caught by fishers must be returned to the water.

The female incubates the eggs for about 18 days. When the embryos inside are mature she shakes the eggs off her abdomen and they hatch into zoea. A new life cycle has begun!

Predators – and prey

Blue swimmer crabs feed on small fish, molluscs, worms and small crustaceans. They also occasionally eat algae and seagrass.

In turn, as larvae, they may be prey to fish and sea jellies.

Once juvenile or adult, they are vulnerable to various fishes and birds eating them, as well as other blue swimmer crabs.

Blue swimmer crabs live in sandy, muddy, algal and seagrass habitats in estuaries, sheltered bays and offshore waters up to 50 metres deep.

By day, they usually hide beneath the sand with only their eyes protruding, ready to launch themselves, claws outstretched, at small fish and invertebrate prey. At night, they become mobile, using currents to help them find food.



One crab stock or many?

In WA, blue swimmer crabs were once thought to be all part of a single breeding population, with areas along the coast re-populated each year by the return of larvae from the ocean.

However, recent genetic studies indicate that in some areas there is limited 'gene flow' and a high likelihood that blue swimmer crab populations in areas such as Cockburn Sound may largely depend on their own breeding stocks to maintain population numbers.

This means that if crab breeding stocks are heavily fished or breeding fails in these areas due to environmental causes, there is a strong risk that the crab population may remain at very low levels.



Blue swimmer crabs are the most sought-after recreational fishing species in WA.

Good years and bad years: recruitment

'Recruitment' is a term used by researchers to describe the addition of crabs or fish (juvenile or of legal size) to a population, either by reproduction or migration.

Levels of recruitment of adult crabs to WA's blue swimmer crab populations fluctuate considerably. A range of environmental factors – including water temperature variations, the relative strength of wind and current systems, and the amount and timing of rainfall – can affect the survival and growth rates of crab larvae and juveniles. This in turn leads to big fluctuations in the available crab harvest from time to time.

Estuaries along WA's west coast, including the Peel-Harvey near Mandurah, are under pressure from rapid population growth. This includes increases in recreational and commercial fishing activity, urban development and associated environmental change, which may also affect crab recruitment.

A major fishery

WA's annual blue swimmer crab commercial catch usually exceeds 1,000 tonnes – making up more than half Australia's total catch of this species. The remainder are caught in South Australia, southern Queensland and New South Wales.

Blue swimmer crabs are fished commercially in bays and estuaries along the WA coast, with the major fisheries including Shark Bay and Nickol Bay in the Pilbara.

Hundreds of tonnes of blue swimmer crabs are also caught each year by WA recreational fishers, with popular areas including Geographe Bay near Busselton, Leschenault Inlet near Bunbury, the Peel-Harvey Estuary, the Swan River, Shark Bay and Nickol Bay.

Concern about the state of stocks led to a complete closure of Cockburn Sound and a seasonal closure of the Peel-Harvey Estuary in December 2006 to both commercial and recreational blue swimmer crab fisheries. Improvement in the stocks in Cockburn Sound over the three years after the closure resulted in a partial (seasonal) re-opening to crabbing in December 2009.



Management methods

Several protective measures are used to ensure the sustainability of WA's blue swimmer crab populations, including commercial licences and – for both recreational and commercial fishers – area and seasonal crabbing closures, gear restrictions, and bag and boat limits. The minimum legal size limit ensures crabs are able to spawn at least once before they are caught.

Male or female?

Male blue swimmer crabs, sometimes called 'blueys', are bigger and more colourful than the females, with a dark-blue carapace, pale belly and rich blue on their legs and claws. Females crabs are a mottled brown. Males also have longer claws in proportion to their carapace than females.

However the easiest way to check if a blue swimmer crab is male or female is to turn it upside down and look at the V-shaped abdominal flap on its underside. A male's flap is narrow and angular, while a female's flap is broad and rounded.



FEMALE



MALE

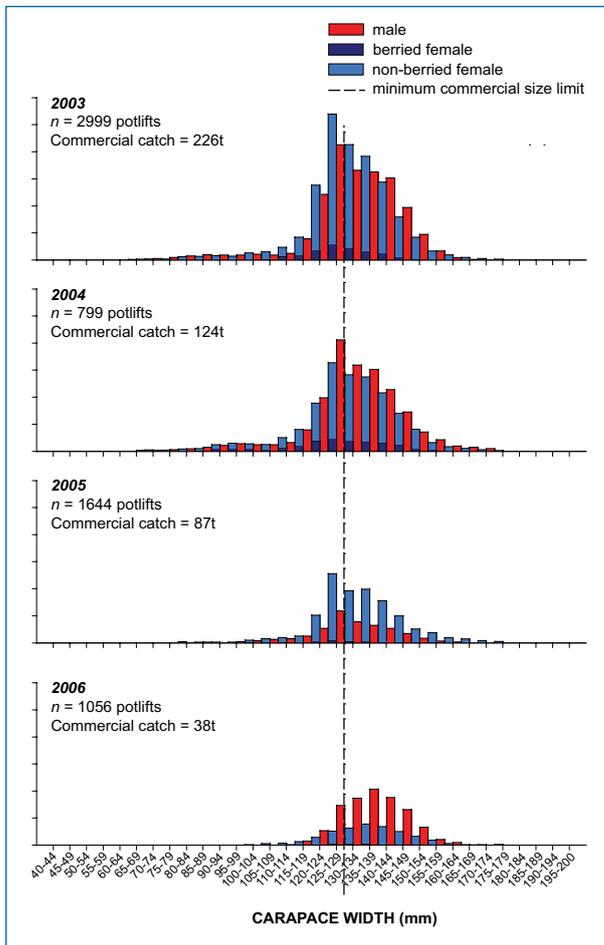
Fishy science: protecting blue swimmer crabs

To protect blue swimmer crab populations into the future, the Department of Fisheries uses a number of methods to monitor the status of crab populations.

These include trapping and trawling exercises – which provide researchers with information about the age and reproductive condition of crabs in each population – and data about commercial catches, effort and catch rates, along with catch surveys, which provide an estimate of the recreational catch and effort.

By analysing commercial and recreational catches, and comparing this information with knowledge about the crabs' biology and the age and gender structure of the population being fished, researchers can draw conclusions about the state of the stock.

In WA, research is continuing into the relationship between different blue swimmer crab populations. This requires an understanding of the crabs' growth and movement patterns, and the impact of environmental factors on breeding and growth, as well as fishing and other human activities.



Length–frequency distributions from catch monitoring surveys in Cockburn Sound.

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Glossary

Age structure

Number of crabs (or fish)
of different ages within a
population

Area closure

Closure to fishing in a
certain area

Berried

When a female crab carries eggs
attached to her abdominal flap

Breeding stock

Mature crabs in a population
that are able to breed

Carapace

A protective plate or shell
covering the crab's back

Catch rate

Amount of crabs (or fish) caught
in relation to fishing effort

Catch survey

(also called **creel survey**)
Survey of recreational catch,
usually involving interviewing
fishers at fishing sites

Effort

The amount of time spent fishing
by a given group of fishers

Embayment

A semi-enclosed coastal
water body

Gene flow

(also called **gene migration**)
The transfer of genetic DNA
codes between populations

Harvest

Amount of crabs caught

Megalopae

Post-larval stage in a crab

Moult

Shed or discard old shell in order
to grow a new one

Recruitment

Addition of crabs (or fish)
to population as a result of
reproduction, migration or growth
to legal size

Seasonal closure

Closure to fishing at a certain
time (e.g. for a period of weeks
or months)

Zoea

A crab larvae

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Fish illustrations

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FURTHER INFORMATION

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