Blue Swimmer Crab (2020)

Portunus armatus

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STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
Western Australia	Cockburn Sound	Depleted	Catch, CPUE, fishery-independent recruitment index, egg production index
Western Australia	Peel-Harvey Estuary	Sustainable	Catch, CPUE
Western Australia	Shark Bay	Sustainable	Catch, CPUE, fishery-independent recruitment and breeding stock abundance
Western Australia	Western Australia North Coast	Sustainable	Catch, CPUE
Western Australia	Western Australia South-West Coast	Sustainable	Catch, CPUE
Queensland	North-Eastern Australia	Sustainable	Stock assessment, standardised catch rates, fishery-independent recruitment abundance
New South Wales	South Eastern Australia	Sustainable	Catch, standardised catch rates, estimated biomass
South Australia	Gulf St. Vincent	Sustainable	Fishery-independent legal-sized relative catch rate
South Australia	Spencer Gulf	Sustainable	Fishery-independent legal-sized relative catch rate
South Australia	West Coast	Sustainable	Catch, CPUE

STOCK STRUCTURE

Blue Swimmer Crab is distributed in Australia from the south coast of Western Australia, north to the Northern Territory, across Queensland, down the east coast and to the New South Wales–Victoria border. They are also found in the warmer waters of the South Australian gulfs [Kailola et al. 1993].

In Western Australia, Blue Swimmer Crab is fished in numerous fisheries across five regions. The stock delineation between these regions is unknown [Chaplin et al. 2001; Chaplin et al. 2008]. Stock structure on the east coast of Australia is uncertain, involving overlapping stocks or a semi-continuous stock [Chaplin et al. 2001]. Due to the geographic separation between the major fishing grounds for Blue Swimmer Crab in New South Wales and Queensland, they are managed as two separate biological stocks. In South Australia, research has identified three separate biological stocks of Blue Swimmer Crab—in Spencer Gulf, Gulf St Vincent and on the coastline west of the Eyre Peninsula [Bryars and Adams 1999, Dixon and Hooper 2011].

Here, assessment of stock status is presented at the biological stock level—North-Eastern Australia (Queensland), South-Eastern Australia (New South Wales), Spencer Gulf, Gulf St Vincent and West coast (South Australia), and at the management unit level—Shark Bay, Cockburn Sound, Peel-Harvey Estuary, Western Australian North Coast and Western Australian South-West Coast (Western Australia).

STOCK STATUS

Cockburn Sound

Historically, variations in recruitment of Blue Swimmer Crabs in the Cockburn Sound (Crab) Managed Fishery and recreational fishery have been driven by environmental conditions, which have caused large fluctuations in stock abundance and annual commercial catch [de Lestang et al. 2010]. A shift by commercial fishers from using gill nets to traps in the mid-1990s resulted in a marked increase in annual crab landings. Following a series of high catches (250–350 t) in the late-1990s, the catch declined significantly [Johnston et al. 2011a,b]. Fishery-independent surveys indicated that low recruitment was a result of high fishing pressure combined with poor environmental conditions, which reduced the spawning stock to low levels and required the closure of the fishery in December 2006 [de Lestang et al. 2010; Johnston et al. 2011a,b]. Fishery-independent trawl surveys indicated that the strength of recruitment and the spawning stock biomass did not improve sufficiently to reopen the fishery until December 2009. The commercial fishing season for 2010 was restricted to 3.5 months and minimum size limits were increased from 130 mm carapace width (CW) to 140 mm to ensure that the catch level would enable continued recovery of the spawning stock biomass. At that time, the fishery was assessed to be recovering.

Based on improving abundances of juveniles (aged 0+ years) and increased egg production levels in 2010, 2011 and 2012, commercial management restrictions were eased. This easing included lengthening the fishing season to six months (December–June) and decreasing the minimum size to the pre-closure size limit of 130 mm CW, while retaining a 20 per cent reduction in trap numbers. However, catches remained low at around 50 t, with catch rates declining from 1.1 kg per trap-lift in 2010 to 0.5 kg per trap-lift in 2012. In 2013, despite a slight increase in catch to 62 t, fishery-independent trawl surveys indicated low recruitment, similar to the low levels preceding the closure in 2006. Although egg production (based on mature female abundance) in 2012 was within the historical range, a low proportion of berried females was observed during commercial monitoring and fishery-independent trawl surveys between September 2012 and January 2013, potentially explaining the low recruitment observed in 2013. The role of the 2010–11 marine heatwave in the recruitment decline is not clear; some evidence suggests that crabs in Cockburn Sound were in poor nutritional condition during this period, possibly due to a lack of prey.

The commercial fishery was closed early in the 2013–14 season as a result of very low stock biomass and low egg production and the majority of the recreational fishery was closed soon after. A harvest strategy has been developed for the Cockburn Sound Crab Fishery using juvenile and egg production indices as performance indicators, with associated limit reference levels [Johnston et al. 2020a].

The juvenile index from 2014 to 2018 remained very low (0.03–0.11 juveniles/100 m[2] trawled) and despite a small increase, the 2019 index of 0.04 juveniles/100 m[2] remains substantially below the limit reference level of 0.4 juveniles/100 m[2] trawled, indicating that recruitment is at unacceptable levels [Johnston et al, 2020a].

Since the improvement of the egg production index in 2016, this index has declined from 2017 to 2019, with the 2019 value of 5.4 ×10[6] eggs/traplift being less than half the limit reference value of 12 x 10[6] eggs/traplift. This suggests that breeding stock levels remained low, and the fishery remained closed for the 2019–20 season [Johnston et al. 2020a]. Catch rates undertaken aboard a leased commercial vessel during the closure did not improve significantly in 2019.

Potential reasons for the stock decline include reduced primary productivity, changes in water temperature, increased predation, a low abundance of mature females and/or low proportion of berried females, and the negative effects of density-dependent growth [Johnston et al. 2020a]. The more recent declines in abundance and lack of recovery are believed to be substantially attributable to environmental changes, rather than fishing, with the commercial and recreational fishery closed for the last six years.

The above evidence indicates that the spawning stock biomass is likely to be depleted and that recruitment is likely to be impaired. Fisheries management has responded appropriately to indications of reduced abundance and environmental changes, and the above evidence indicates that current fishing mortality is constrained by management to a level that should allow the stock to recover from its recruitment impaired state. However, measurable improvements are yet to be detected.

On the basis of the evidence provided above, the Cockburn Sound (Crab) Managed Fishery (Western Australia) management unit is classified as an environmentally limited **depleted stock**.

Gulf St. Vincent

In the South Australian gulfs, access to take Blue Swimmer Crabs is provided via a Blue Crab Fishery (BCF) or a Marine Scalefish Fishery (MSF) licence endorsed with quota entitlements. The MSF licence holders predominantly use hoop and drop nets while the pot fishing sector of the BCF uses specifically designed crab pots. Determination of stock status is based on a fishery-independent pot survey with trigger and limit reference points based on survey catch rate, as indices of relative biomass and fishing mortality [PIRSA 2020]. The TACC levels have been set since 1996 to limit Blue Swimmer Crab catches within ecologically sustainable limits set in the management plans [PIRSA 2020]. Since 1999–2000, exploitation rates have been limited by setting the TACC at levels below the maximum historical catch for the fishery. Throughout South Australia, a legal minimum size (LMS) of 110 mm carapace width (CW) is enforced, at which size crabs are approximately 14–18 months old and sexually mature. Females produce at least two batches of eggs each season [Kumar et al. 2003].

The most recent stock assessment reported that 97% of the TACC (382 t) was harvested in the 2018–19 season [Beckmann et al. 2020]. Catch rates of legal-sized crabs in 2019 (5.3 kg crabs per pot-lift) were above the target reference point (3.7 kg crabs per pot-lift) and the highest on record [Beckmann et al. 2020]. The catch rate of legal-sized crabs has been above the trigger reference point since 2016. The above evidence indicates that the biomass of this stock is

unlikely to be depleted and that recruitment is unlikely to be impaired. Furthermore, the above evidence indicates that the current level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

On the basis of the evidence provided above, the **Spencer Gulf biological stock** is classified as a **sustainable stock**.

North-Eastern Australia

The Queensland Blue Swimmer Crab fishery primarily operates in southern Queensland. Prior to 1998, the majority of fishing was conducted inshore, in and around Moreton Bay. In 1998 commercial pot fishers began exploiting Blue Swimmer Crab populations further offshore, in areas that were previously lightly fished. Fishing in offshore waters peaked in 2003, when the offshore harvest contributed approximately 70 per cent to total harvest. By 2015, the offshore harvest had decreased and returned to levels slightly higher than those pre-expansion. This rise and subsequent fall of harvest in the offshore area may indicate a decline in fishable biomass for the offshore area and the biological stock as a whole [Johnston et al. 2018]. However, proposed management reforms and subsequent over-reporting within the fishery prior to the investment warning released in 2003 likely reduced the reporting reliability of commercial catch records around this time [QDAF 2019].

Queensland assessed the north-eastern Australian Blue Swimmer Crab stock in 2020 (including data up until the 2018–19 financial year) using an integrated stock assessment model. The model estimated exploitable biomass to be at around 33 per cent relative to unfished levels [Lovett et al. 2020]. Under the current management arrangements (i.e. minimum legal size, no-take females), maximum sustainable yield (MSY) is estimated to be around 722 t [Lovett et al. 2020]. Average combined commercial and recreational harvest from the most recent five years was approximately 394 t (336 and 28 t respectively), well below estimated MSY [Lovett et al. 2020].

Catch rates have been declining since 2003 with the 2018–19 season having recorded the lowest catch rate over the last two decades (17 kg/day). While catch rates in recent years have been low, historical records indicate periods where catch rates have been close to this figure (18 to 22 kg/day between the 1991–92 and 1997–98 fishing seasons). Declining catch rates may indicate a reduction in the level of biomass for the Queensland east coast biological stock. Fishery independent surveys show that recruitment abundance has generally been stable through time, with three distinct peaks in 2008, 2014, and 2017 [Bessell-Browne et. al. 2020], although recruitment target reference points are yet to be established by Fisheries Queensland. The most recent stock assessment [Lovett et al. 2020] estimates that spawning biomass displays similar trends to the exploitable biomass, and in 2018–19 was estimated to be around 60 per cent of 1988–89 levels. This stock is not considered to be recruitment impaired.

Active commercial pot fishing licences and fishing effort (in days fished) decreased between 2003 and 2019 by approximately 70 and 74 per cent respectively [QFISH 2020]. Long term trends in total catch and effort are directly proportional to the expansion and subsequent contraction of fishing in offshore areas [Sumpton et al. 2015], with overall fishing pressure on the Blue Swimmer Crab stock showing a decline.

Spatial closures within the Moreton Bay, Great Sandy Strait and Great Barrier Reef Marine Parks provide some additional protection of the Blue Swimmer Crab biomass from fishing mortality [Johnstone et al. 2018]. Management arrangements in Queensland prohibit the take of female crabs, and a minimum legal size of 115 millimeters carapace width ensures that a high proportion of male Blue Swimmer Crabs have an opportunity to mate before recruitment into the fishery [Johnston et al. 2018]. This level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

On the basis of the evidence provided above, the North-Eastern Australia (Queensland) biological stock is classified as a **sustainable stock**.

Peel-Harvey Estuary

The gradual conversion from targeting Blue Swimmer Crabs using gillnets to using hourglass traps in the Peel-Harvey Estuary Crab Fishery (Area 2 of the West Coast Estuarine Managed Fishery) between the mid-1990s and early-2000s resulted in an increase in annual crab catches. Commercial catch levels have generally ranged between 50 and 100 t annually. A recreational boat-based survey conducted in Western Australia in 2017/18 estimated the total state-wide recreational catch of Blue Swimmer Crabs to be approximately 61.1 t, of which 90 per cent (by number) were caught in waters within the Metro Zone (which includes the Swan and Canning Rivers and Peel-Harvey Estuary crab fisheries) (Ryan et al. 2019).

Stock assessments for the Peel-Harvey Estuary Crab fishery (PHECF) use a weight-of-evidence approach wherein information from fishery-independent surveys, commercial monitoring and environmental data are used to determine stock status [Johnston et al. 2020a]. The PHECF is managed under a formal harvest strategy, using annual standardised catch rates (catch per unit effort, CPUE) and total catch for each fishing season (November–August) [Johnston et al. 2014, 2015, 2020a]. Since conversion from nets to traps in 2000–01, annual standardised commercial catch rates have fluctuated between 0.8 and 1.4 kg per trap-lift, but have generally remained above 1 kg per trap-lift. In 2012–13, a catch of 107 t and a standardised CPUE of 1.4 kg per trap-lift were the highest on record. The PHECF gained Marine Stewardship Council certification in 2016, being the first fishery to have attained such certification for both commercial and recreational sectors [Johnston et al. 2015]. The commercial catch and effort from the Peel-Harvey Estuary for the 2018–19 fishing season (November–August) was 66.5 t, a decrease of 30 t from the 2017–18 season. The standardised catch rate of 0.92 kg/traplift for the 2018–19 fishing season was a decline from 1.4 kg/traplift in 2017–18, but remains above the harvest strategy threshold of 0.7 kg/traplift. The above evidence indicates that the biomass of this stock is unlikely to be depleted and that recruitment is unlikely to be impaired.

The breeding stock in this region has additional protection because the size at maturity (86–98 mm CW) is well below the legal minimum size (LMS) (127–130 mm carapace width, CW). Spawning occurs near the mouth and outside the estuary following flushing of crabs from the estuary during winter, providing the spawning stock with further spatial protection from fishing. The above evidence indicates that current fishing pressure is unlikely to cause the stock to become recruitment impaired.

On the basis of the evidence provided above, the Peel-Harvey Estuary Crab Fishery (Area 2 of West Coast Estuarine Managed Fishery) (Western Australia) management unit is classified as a **sustainable stock**.

Shark Bay

The Shark Bay Crab Managed Fishery for Blue Swimmer Crab expanded rapidly between 2000 and 2010. In 2010, it was Australia's highest producing Blue Swimmer Crab fishery, with landings of 828 tonnes (t), collectively caught by the dedicated crab trap sector and as by-product by the prawn and scallop trawl sector. This stock also supports a small (around ~5 t) but important recreational fishery. In late 2011, the crab stock in Shark Bay was found to be at historically low levels (with commercial and survey catch rates below limit reference levels) as a combined result of fishing, recruitment failure and increased natural mortality of the adult stock. This was attributed to the combination of the effects of an extreme marine heat wave event during the summer of 2010–11, two significant flooding events and high fishing pressure in the years prior [Chandrapavan et al. 2019].

Commercial fishing for Blue Swimmer Crabs in Shark Bay ceased in April 2012

on a voluntary, industry-agreed basis to facilitate stock rebuilding, at which point it was classified as being environmentally limited. During the closure, intensive monitoring of the resource began, using a combination of trawl and trap-based fishery-independent surveys. The surveys provide indices of spawning stock and recruitment levels which are assessed periodically. During 2013, indices of spawning stock increased from 200 kg per square nautical mile (below the limit reference of 300) to 1 789, and recruitment levels improved from 991 kg per square nautical mile (with a limit reference level of 700) to 2 197 (kg per square nautical mile). These improved indices indicated a recovering stock and provided some confidence for the resumption of limited commercial fishing for Blue Swimmer Crabs in Shark Bay [Chandrapavan et al. 2018].

In 2015, the fishery transitioned to a fully managed status under a new management plan, which includes a system of individual transferable quotas that applies across all three commercial sectors in Shark Bay. A formal harvest strategy has also now been developed for the fishery, where quota setting is now based on three primary performance indicators of peak spawning (during June), peak recruitment (during February) and residual legal biomass levels (during November), while secondary indicators include quota achievement and standardised commercial trap catch rates [DPIRD, 2020].

Since 2013, annual stock assessments have indicated a steady stock recovery under catch levels of up to 529 t. In 2019, the TACC was maintained at 550 t and the fishery was deemed fully recovered. However the mid-season review of the TACC during April 2020 indicated a significantly large recruitment event had occurred where the spawning and recruitment levels were above the limit, and legal biomass and commercial catch rates were well above the target reference levels and above the historical range. This resulted in an increase of the TACC to 650 t for the remainder of the 2019–20 season, the maximum set for this fishery.

On the basis of the evidence provided above, the Shark Bay Crab Managed Fishery (Western Australia) management unit is classified as a **sustainable stock**.

South Eastern Australia

Blue Swimmer Crabs occur in coastal and estuarine waters along the length of the New South Wales coastline. New South Wales Blue Swimmer Crab populations are at the southern end of the species' distribution along the east coast A legal minimum size (LMS) of 60 and 65 mm carapace length (equivalent to 130 and 140 mm carapace width, CW) is enforced for recreational and commercial fishers, respectively. Female crabs close to the LMS are sexually mature, and are capable of producing one–three batches of eggs within a season [Johnson et al. 2010].

The most recent estimate of the recreational harvest of Blue Swimmer Crabs in NSW was approximately 63 000 crabs at around 14 t during 2017–18 [Murphy et al. 2020]. This estimate was based on a survey of Recreational Fishing Licence (RFL) households. RFL households were comprised of at least one member who possessed a long-term (1 and 3 years duration) fishing licence and included other fishers resident within their households.

A similar survey of RFL households was done in 2013–14 and provides a comparison with data from the 2017–18 survey. The recreational catch of Blue Swimmer Crabs in NSW in 2013–14 was approximately 50 600 crabs estimated to weigh 27 t [Murphy et al. 2020]. The annual recreational harvest of Blue Swimmer Crabs in New South Wales was previously estimated to lie between 150 and 310 t based on the results of the National Recreational and Indigenous Fishing Survey [Henry and Lyle 2003] and surveys undertaken by New South Wales Department of Primary Industries.

The primary indicators for biomass and fishing mortality are commercial catch and standardised commercial catch rate. Commercial catches of this species

tended to fluctuate around a long-term average of about 144 t over the period 2000–01 to 2016–17. However, following the implementation of quota management and the increase in LMS, reported commercial landings in 2017–2018 and 2018–19 declined to 104 t and 79 t, respectively [Johnson 2020]. This decline is attributed to the management changes rather than a decline in relative abundance. Four estuaries account for 85 per cent of commercial Blue Swimmer Crab landings in New South Wales, the most important being Wallis Lake (45.3 t in 2018–19). Catch during the most recent complete quota year (July 2018 to June 2019) was 79 t, indicating that the newly implemented total allowable commercial catch (225 t) failed to operate as an effective fishery control and could be adjusted in future to control catches if desired.
Standardised commercial catch rates (in mean CPUE kg-day[-1]) are likely to be the most reliable index of relative abundance for Blue Swimmer Crabs. For recent data analysed as mean daily catch rates (available from 2009–10 to 2018–19), catch rates in Wallis Lake have declined by more than 50% in the two most recent years [Johnson 2020]. The impact of recent management changes (i.e. quota management and MLL increase) on catch-rates has not been quantified but are expected to have driven this decline. While catch rates in Wallis Lake in recent years have declined below the recent peak (2014–2016), they are similar to historic levels calculated for a period with consistent management arrangements (1997–2009). In contrast, since 2011, catches rates in the other main estuaries (landings > 1 t/ year) have fluctuated around the long-term average [Johnson 2020].

Catch-MSY model-assisted catch-only assessment [Martell and Froese 2013] was fitted to commercial catch from 1984–85 to 2018–19 using the 'simpleSA' package in R [Haddon et al. 2018]. Results of modified Catch-MSY modelling suggest that the current biomass of Blue Swimmer Crab in NSW waters is depleted to 32% relative to unfished levels with a 95% confidence interval of 6%–57% [Johnson 2020]. The assessment estimated maximum sustainable yield (MSY) to be around 155 t. Average combined commercial and recreational harvest over the last six years was approximately 170 t (151 and 19 t respectively), with estimated landings in 2014–15 (239 t) equivalent to the upper bound of estimated MSY (238 t). The increased LMS for the commercial sector potentially protected 55% of egg producing females from harvesting [Johnson et al. 2010]. Additionally, the implementation of daily possession limit for all ocean fisheries (25 kg) has reduced fishing pressure on the spawning stock, resulting in a decline in harvest rate over the last two years. Nominal effort levels (in the number of fisher days) over the past eight years have remained steady (~4000 per year) and, are well below historical levels (> 8 000 per year). This reduction in fishing effort in combination with stable size compositions in landings [Johnson 2020] indicates that fishing mortality is constrained in New South Wales waters to sustainable levels. The above evidence indicates that the biomass of this stock is unlikely to be depleted and that recruitment is unlikely to be impaired. However, if the level of fishing mortality permitted under existing management arrangements (i.e. TAC 225 t) is combined with recreational catches estimated at 20% of total harvest, Catch-MSY model outputs include some trajectories that deplete biomass to less than 20% of unfished levels within five years [Johnson, 2020]. The modelling approaches used in the current assessment are relatively simplistic; therefore, results should be interpreted with caution. There is high uncertainty in the estimates of biomass depletion, harvest rate and MSY derived from catch data using Schaefer production model-assisted Catch-MSY analysis.

On the basis of the evidence provided above, the South Eastern Australia biological stock is classified as a **sustainable stock**.

Spencer Gulf

In the South Australian gulfs, access to commercially harvest Blue Swimmer Crabs is provided via a Blue Crab Fishery (BCF) or a Marine Scalefish Fishery (MSF) licence endorsed with quota entitlements. The MSF licence holders predominantly use hoop and drop nets while, the pot fishing sector of the BCF

uses specifically designed crab pots. Determination of stock status is based on a fishery-independent pot survey with trigger and limit reference points based on survey catch rate, as an index of relative biomass and fishing mortality [PIRSA 2020]. The TACC levels have been set since 1996 to limit Blue Swimmer Crab catches within ecologically sustainable limits set in the management plans [PIRSA 2020]. Since 1999–2000, exploitation rates have been limited by setting the TACC at levels below the maximum historical catch for the fishery. Throughout South Australia, a legal minimum size (LMS) of 110 mm carapace width (CW) is enforced, at which size crabs are approximately 14–18 months old and sexually mature. Females produce at least two batches of eggs each season [Kumar et al. 2003].

The most recent stock assessment reported that 97% of the TACC (382 t) was harvested in the 2018–19 season (Beckmann et al. 2020). Catch rates of legal-sized crabs in 2019 (5.3 kg crabs per pot-lift) were above the target reference point (3.7 kg crabs per pot-lift) and the highest on record [Beckmann et al. 2020]. The catch rate of legal-sized crabs has been above the trigger reference point since 2016. The above evidence indicates that the biomass of this stock is unlikely to be depleted and that recruitment is unlikely to be impaired. Furthermore, the above evidence indicates that the current level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

On the basis of the evidence provided above, the **Spencer Gulf biological stock** is classified as a **sustainable stock**.

West Coast

On the West Coast of South Australia, access to take Blue Swimmer Crabs is provided via a Marine Scalefish Fishery (MSF) licence. MSF licence holders predominantly use hoop and drop nets. The West Coast zone is not subject to the quota management system and is managed separately to the BCF. This zone of the fishery operates under the Management Plan for the MSF [PIRSA 2018] that specifies general performance indicators assessed in Steer et al. [2020].

In 2018–19 a total of 47.4 t was harvested (1 July 2018–30 June 2019) and this was above the ten-year average (2008–09–2017–18; 47.1± 3.2 t). The primary indices of biomass and fishing mortality for the West Coast biological stock are the commercial CPUE and catch trends. Comparison of recent CPUE and catch trends to values in the past decade is considered to provide a reliable proxy for relative biomass and fishing mortality. These historical values have been stable at relatively high levels, indicating that the biomass of this stock was unlikely to be depleted or that recruitment was unlikely to be impaired in the past decade. The 2018–19 targeted crab net catch rate was 70.3 kg per boat day and the catch rate has remained around this level since 2007–08 (range: 52.3–79.4 kg per boat day). The above evidence indicates that the biomass of this stock is unlikely to be depleted, that recruitment is unlikely to be impaired and that the current level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

On the basis of the evidence provided above, the West Coast biological stock is classified as a **sustainable stock**.

Western Australia North Coast

The Western Australia North Coast management unit is made up of two dedicated crab trap fisheries—the Pilbara Crab Managed Fishery (PCMF), and the Exmouth Gulf Developing Crab Fishery (EGDCF)—and crab taken as by-product in certain prawn trawl fisheries—the Exmouth Gulf Prawn Managed Fishery (EGPMF), Onslow Prawn Managed Fishery (OPMF) and Nickol Bay Prawn Managed Fishery (NBPMF). Total catch for all these fisheries in 2019 was 28.3 t, a decline from the catch of 55.5 t reported in 2017. Negligible Blue Swimmer Crab catches have been reported in recent years from the EGCDF and the OPMF, with both fisheries catching the species intermittently.

The annual standardised catch rate from the PCMF provides an index of

abundance that can be used to assess fishery performance. After significant increases in 2013 (1.9 kg/traplift), and 2014 (1.5 kg/traplift), the annual catch rate declined to 0.6–1.0 kg/traplift during 2015–18. However, the fishery recorded an annual standardised catch rate of 1.5 kg/traplift in 2019, representing an 88% increase from 2018. This catch rate is well above the preliminary harvest strategy threshold of 0.46 kg/traplift, indicating there should be adequate egg production under typical environmental conditions (Johnston et al., 2020b). The above evidence indicates that the biomass in this management unit is unlikely to be depleted and that current levels of fishing mortality are unlikely to cause the management unit to become recruitment impaired.

On the basis of the evidence provided above, the Western Australia North Coast management unit is classified as a **sustainable stock**.

Western Australia South-West Coast

The Western Australia South-West coast management unit is made up of a number of dedicated minor crab trap and gillnet fisheries: the Warnbro Sound Crab Managed Fishery (WSCMF), the Swan and Canning Rivers Crab Fishery (SCRCF – a part of the West Coast Estuarine Managed Fishery), the Mandurah to Bunbury Developing Crab Fishery (MBDCF), the South Coast Estuarine Managed Fishery (SCEMF), as well as crab taken as by-product in other net and trawl fisheries. Total catch for these fisheries in 2019 was 40.7 t, which is an increase from 21.3 t reported in 2017. This increase was primarily a result of increased catch for the SCEMF (10.5 t in 2017 to 19 t in 2019) and the SCRCF (1 t in 2017 to 9.5 t in 2019).

Following some of the highest Blue Swimmer Crab catches on record for the SCEMF between 2013 and 2016, possibly resulting from above average water temperatures in 2011–12 and 2012–13 having a positive impact on recruitment of these southern stocks, the catch decreased in 2017 and 2018 before increasing again in 2019. Stock abundance of Blue Swimmer Crabs in the SCEMF appears to be heavily influenced by the strength of the warm, southward flowing Leeuwin Current. Crabs recruit to these waters during strong current years which result in warmer water temperatures, with subsequent catch and effort highly variable in response to these pulses of abundance. Following an unusually high rainfall event at the beginning of 2017 that severely impacted commercial operations, catches in 2019 have returned to historical levels in the SCRCF (annual catch around 6–10 t). The standardised catch rate for the SCRCF in 2019 was well above the harvest strategy threshold of 6.2 kg 100 m net[−1]. Although catch declined slightly in 2019 for the MBDCF, standardised catch rates for Area 1 of this fishery (Comet Bay) were within the target range, with Area 2 (Mandurah-Bunbury) not fished. Standardised catch rates in the WSCMF were above the threshold level of 0.8kg/traplift.

Catch rates for all Blue Swimmer Crab on the South-West Coast remain above threshold levels, indicating that stocks are currently fished at sustainable levels. The above evidence indicates that the biomass in this management unit is unlikely to be depleted and recruitment is likely to be impaired. The above evidence also indicates that current levels of fishing mortality are unlikely to cause the stock to become recruitment impaired.

On the basis of the evidence provided above, the Western Australia South-West Coast management unit is classified as a **sustainable stock**.

BIOLOGY

Blue Swimmer Crab Biology [de Lestang et al. 2003a,b, Sumpton et al. 2003]

Species	Longevity / Maximum Size	Maturity (50 per cent)
Blue Swimmer Crab	3–4 years, ~ 200 mm CW	Varies among locations, 6–14 months, 86–110 mm CW

DISTRIBUTION

Blue Swimmer Crab Spatial Distribution

TABLES

Fishing methods				
	New South Wales	Queensland	South Australia	Western Australia
Commercial				
Blue Swimmer Crab Trap		✓	✓	
Crab Trap				✓
Gillnet				✓
Haul Seine				✓
Mesh Net	✓			
Otter Trawl	✓			✓
Traps and Pots	✓			✓
Trawl		✓		
Unspecified			✓	
Various	✓			
Recreational				
Blue Swimmer Crab Trap				✓
Coastal, Estuary and River Set Nets			✓	✓
Dip Net	✓			

Diving			✓	✓
Hoop Net	✓			
Traps and Pots	✓	✓		

Management Methods				
	New South Wales	Queensland	South Australia	Western Australia
Charter				
Gear restrictions		✓		
Protection of female crabs		✓		
Size limit		✓		
Spatial closures		✓		
Commercial				
Effort limits		✓		✓
Gear restrictions	✓	✓	✓	✓
Limited entry	✓	✓	✓	✓
Protection of egg-bearing females	✓		✓	✓
Protection of female crabs		✓		
Size limit	✓	✓	✓	✓
Spatial closures	✓	✓	✓	✓
Spatial zoning	✓		✓	✓
Temporal closures			✓	✓
Total allowable catch	✓		✓	✓
Vessel restrictions	✓	✓		✓
Recreational				
Bag limits			✓	✓
Boat limits			✓	✓
Gear restrictions	✓	✓	✓	✓
General recreational licence or fishing boat licence (not species	✓			✓

specific)				
Limited entry (licensing)				✓
Passenger restrictions				✓
Possession limit		✓		
Protection of egg-bearing females	✓		✓	✓
Protection of female crabs		✓		
Size limit	✓	✓	✓	✓
Spatial closures	✓	✓	✓	✓
Spatial zoning				✓
Temporal closures				✓

Catch				
	New South Wales	Queensland	South Australia	Western Australia
Charter				< 0.5 t
Commercial	77.8485 t	217.246 t	45.4583 t	688.272 t
Indigenous	Unknown	Unknown	Unknown	Unknown
Recreational	14 t (2017–18)	28 t (2019–20)	376 t (Dec 2013–Nov 2014)	63 t (2017/18)

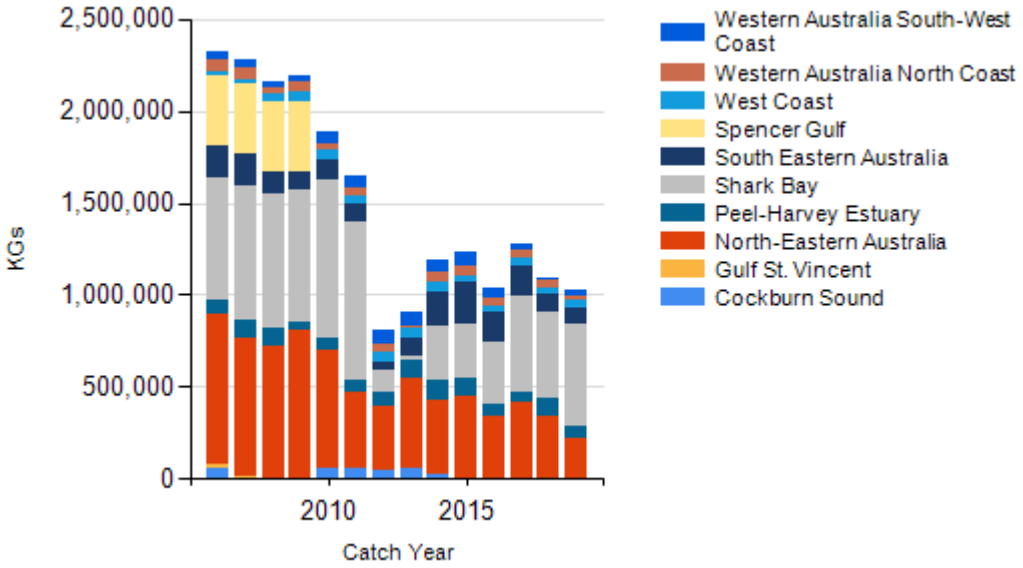
Western Australia – Recreational (catch) Boat-based recreational catch in 2017/18 [Ryan et al. 2019]. Does not include scoop netting and other methods of recreational fishing.

Queensland – Indigenous (management methods) for more information see https://www.daf.qld.gov.au/business-priorities/fisheries/traditional-fishing

New South Wales – Indigenous (Management Methods)
https://www.dpi.nsw.gov.au/fishing/aboriginal-fishing

New South Wales – Recreational (Catch) Recreational catch estimate of 26.7 t is based on (i) an estimated recreational catch of 50 637 Blue Swimmer Crabs by NSW resident recreational anglers in 2013–14 [West et al. 2015]; and (ii) an assumed mean weight of kept Blue Swimmer Crabs of 0.530 kg/crab. This remains the most reliable estimate of annual recreational catch because the 2017-18 survey estimate of 14.2 t estimated using a mean weight of 0.225 kg/ crab [Murphy et al. 2020] applies only to 1-3 year recreational licence holders.

CATCH CHART



Commercial catch of Blue Swimmer Crab - note confidential catch not shown.

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