

# MUD CRABS (2023)

*Scylla spp., Scylla serrata, Scylla olivacea*



**Amy Kirke** : Department of Industry, Tourism and Trade, Northern Territory, **Daniel Johnson**: New South Wales Department of Primary Industries, **Danielle Johnston**: Department of Primary Industries and Regional Development, Western Australia, **Julie Robins**: Department of Agriculture and Fisheries, Queensland

## STOCK STATUS OVERVIEW

Jurisdiction	Stock	Stock status	Indicators
Western Australia	Kimberley Developing Mud Crab Fishery	Sustainable	Catch, effort, catch rate
Northern Territory	North West Northern Territory	Sustainable	Catch, effort, catch rate
Northern Territory	Western Gulf of Carpentaria	Sustainable	Catch, effort, catch rate, biomass, fishing mortality
Queensland	East Coast	Sustainable	Catch-MSY modelling, catch, effort, nominal catch rate, biomass, fishing mortality
Queensland	Gulf of Carpentaria Queensland	Sustainable	Catch-MSY modelling, catch, effort, nominal catch rate, biomass, fishing mortality
New South Wales	Estuary General Fishery	Sustainable	Catch, catch rate, biomass, fishing mortality

## STOCK STRUCTURE

Two species of Mud Crabs are found in Australian waters: Giant Mud Crab (*Scylla serrata*) and Orange Mud Crab (*S. olivacea*). The former constitutes more than 99% of the commercial catch

of Mud Crabs in the Northern Territory and Queensland, and the entire commercial catch in New South Wales. The species composition in the Kimberley Developing Mud Crab Fishery (Western Australia) is uncertain but is known to vary considerably between locations.

The life history and biology of Giant Mud Crab in the Northern Territory and Queensland are well documented [Heasman 1980; Hill et al. 1982; Hill 1994; Hyland et al. 1984; Knuckey 1999; Alberts-Hubatsch 2015] but, with some exceptions [Butcher et al. 2003; Butcher 2004; Alberts-Hubatsch et al. 2014], corresponding information from Western Australia and New South Wales is scarce. There are no published accounts on the biology of Orange Mud Crab in Australian waters. Hence, all catch, and biological information presented here refers to the Giant Mud Crab (*S. serrata*), unless otherwise stated.

Genetic evidence suggests that there are at least two biological stocks of Giant Mud Crab in Australian waters: one to the west and another to the south-east of the Torres Strait [Gopurenko and Hughes 2002], referred to as the Northern Australian and East Coast biological stocks, respectively.

Female Giant Mud Crab in northern Australia migrate up to 95 km offshore to release their eggs [Hill 1994], which average around 4.5 million per individual [Mann et al. 1999]. Coupled with a planktonic larval stage that can last for several weeks [Nurdiani and Zeng 2007], this reproductive strategy may facilitate significant gene flow between areas (depending on local oceanography). However, there have been significant changes in the relative performance of some fisheries operating across these stocks since 2014, suggesting that, despite larval connectivity, there are different exploitation rates on components of the adult stock in different areas. These changes, combined with different management arrangements for each of the four jurisdictions that harvest Giant Mud Crab, and (in some cases) the need for more information on local population dynamics, and fine-scale stock structure, have resulted in this status report providing status determinations for Giant Mud Crab at the level of fishery management units: Kimberley Developing Mud Crab Fishery (Western Australia); North West Northern Territory Mud Crab Fishery (Northern Territory), Western Gulf of Carpentaria (Northern Territory); Gulf of Carpentaria (Queensland), East Coast (Queensland); and the Estuary General Fishery (New South Wales).

## STOCK STATUS

**East Coast** The Giant Mud Crab is a popular recreational fishery species in the Queensland East Coast management unit. The most recent Queensland statewide recreational fishing survey [Teixeira et al. 2021], reports that Mud Crabs were one of the most recreationally harvested crustaceans, with retained catch estimated at 160 t for the Queensland East Coast and Gulf of Carpentaria combined. Note that this catch may include the retained catch by Indigenous fishers (as survey respondents were not asked about their heritage). These estimates confirm the significance of the non-commercial retained catch, which if compared to reported commercial catch in the same year (i.e., 2019–20) represents around 21% of the overall take. Recent annual catch estimates for recreational and Indigenous fishers are taken into consideration, however, inference of stock status is primarily based on the commercial harvest data.

Queensland has a male-only harvest policy. Therefore, fishing mortality on female Giant Mud Crab is minimal, except for within-pot incidental mortality, and post-release discard mortality. Female and sub-legal male crabs may be handled and released many times during their life, so some incidental fishing mortality is probable [Grubert and Lee 2013] and is likely proportional to regional levels of effort. The Queensland no-take female harvest policy maximises the number of females that survive to spawn. The minimum legal size for males of 150 mm carapace width (CW) is greater than the male minimum size-at-first maturity,

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which is 130 mm CW [Heasman 1980], allowing a proportion of the mature male population protection from harvest and thus ensuring male contribution to breeding.

Management of the fishery includes recreational possession and boat limits, and restrictions on commercial licence numbers and fishing effort. Major recent changes to management of the fishery are the introduction of vessel monitoring systems (VMS) on all commercial crab vessels from 1 January 2019, and the introduction of a Harvest Strategy, a Total Allowable Commercial Catch (TACC) and Individual Transferable Quota (ITQ) specific to the Queensland East Coast (EC1) on 1 September 2021. Escape vents in commercial crab pots were compulsory from this date. These changes altered patterns of fishing behaviour and reporting of retained catch and need to be considered when interpreting trends in the catch time series.

The East Coast (Queensland) Mud Crab Fishery (MCF) management unit accounts, on average, for about 86% of the commercial catch of the east coast Giant Mud Crab biological stock. The commercial catch in the 2021–22 year was 535.2 t; noting the introduction of a TACC of 688.6 t (adjusted for a 10-month quota year) and ITQ on 1 September 2021. Northrup et al. (2019) used a simplified catch-MSY model to estimate that the East Coast (Queensland) mud crab stock was likely to be at 62% of unfished levels in 2017–18 (range: 37 to 69%, assuming 30% over-reporting since the investment warning was issued for this fishery in 2003). The assessment supported an East Coast TACC of 770 t (12-month fishing season = quota year). Since the introduction of VMS and ITQ, the reported mud crab commercial catch from the East Coast (Queensland) MCF management unit is significantly lower than in previous years. There are some concerns that the TACC (770 t) is more than the commercial sector can viably harvest. Ongoing monitoring of the commercial catch which has improved data validation methods (i.e., quota reporting and compliance processes), should better indicate actual commercial harvest. Under the Harvest Strategy for the MCF, the first review year for the TACC is 2023–24.

Several no-take zones (applying to all marine organisms) along the east coast of Queensland provide additional protection to Giant Mud Crab and result in higher densities of crabs of legal size and provide for some spillover of crabs into adjacent fished areas [Pillans et al. 2005; Alberts-Hubatsch 2015]. However, the benefit of these closures, over and above the single-sex harvest policy (and the male size limit) on a fishery-wide scale has not been quantified. While the localised benefits of spatial closures can be significant, their cumulative benefit on Giant Mud Crab spawning biomass across the entire East Coast (Queensland) MCF management unit is unlikely to be significant when considering the suite of protective measures already in place. The above evidence indicates that the biomass of the management unit is unlikely to be depleted and that recruitment is unlikely to be impaired.

Annual fishing effort in 2021–22 was 21,366 days fished, by 219 active licences. There has been a decline in annual fishing effort over the past decade. Reasons for the decline in fishing effort are unvalidated but coincide with the introduction of VMS (1 January 2019) and ITQ (1 September 2021). The annual nominal catch rate (kg per day fished) has increased from 20.6 kg per fishing day in 2019–20 to 25.1 kg per fishing day in 2021–22. The effects of changes in effort and true retained catch levels on the fishing mortality rates of male crabs is not known. Brown [2010] estimated fishing mortality (assumed to be proportional to effort adjusted for trends in catchability due to technological change, Walters 2007) in the East Coast (Queensland) MCF management unit (based on commercial data to 2008) of around 1.5, which is greater than the estimated

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natural mortality rate ( $M = 1.2$ ) for Northern Territory stocks [Knuckey 1999]. However, the East Coast (Queensland) MCF management unit is spatially large, with multiple regions where male Giant Mud Crabs are harvested. The size distribution and abundance of legal male crabs indicates that fishing mortality is not uniform across the East Coast (Queensland) management unit, with localised depletion in some areas (i.e., high fishing mortality) and low to moderate fishing mortality in others [Jebreen et al. 2008; Grubert and Lee 2013].

Ongoing research into Queensland mud crab populations (FRDC 2019-062) is examining (amongst other objectives) insemination rates of female mud crabs to determine if there is evidence of sperm limitation due to high fishing mortality on males 150 mm CW and greater. The presence of mature sub-legal males with mating scars in most regions, suggests that whilst fishing mortality is high, there are functionally mature males contributing to spawning. 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 East Coast (Queensland) Mud Crab Fishery management unit is classified as a **sustainable stock**.

**Estuary  
General  
Fishery**

Part of the Giant Mud Crab population in New South Wales is protected through a minimum size limit (85 mm CL) although the effectiveness of this measure is uncertain because the size at maturity of *S. serrata* in this jurisdiction is not known. That is, whilst studies on the reproductive biology of *S. serrata* from different catchments in northern Australia have reported regional differences in size at sexual maturity [Knuckey, 1999], the life history of *S. serrata* in New South Wales may differ from populations elsewhere as this jurisdiction represents the southern limit of the species' typical distribution on the eastern seaboard.

Several "no take" zones (applying to all marine organisms) along the New South Wales coast afford some protection to Giant Mud Crab and result in higher crab densities in the closed areas, size class distributions biased towards larger crabs, and spillover of crabs into adjacent fished areas [Butcher et al. 2003; Butcher et al. 2014]. However, these spatial closures are relatively small and fragmented, and their cumulative benefit on a fishery-wide scale has not been quantified.

Historically, the primary indicators for biomass and fishing mortality are commercial catch and standardised commercial catch rate. Standardised catch rates were predicted from generalised linear models (GLM). The GLM statistical modelling provided an estimate of mean catch rates that were corrected for a variety of variables that bias raw data. Explanatory model terms considered different catch rates between fishing years, months, management zones, individual fisher operations and their transformed fishing effort. For recent data analysed as mean daily catch rates (available from 2009–10 to 2021–22), catch rates (zones combined) remained stable and above average from 2013–14 to 2017–18, although declining from 2018–19 to 2020–21 [Johnson 2023]. For 2021–22, standardised catch rates from Regions 1 (adjacent to the Queensland border) and 2 (Clarence River) were greater than or equal to the long-term average, while catch rates from regions 3 and 4 located further south were less than the long-term average. Standardised catch rates for the fishery in 2021–22 were greater than 2020–21 [Johnson 2023].

Results of Catch-MSY modelling [Haddon et al., 2018] using NSW commercial catch data from 1978–79 to 2021–22 suggest that the current biomass of Giant Mud Crab in NSW waters is 34% of the unfished biomass with a 95% confidence

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interval (CI) of 11%–58% [Johnson 2023]. Five-year stock projections at catch equal to the current total allowable commercial catch (206 t) with recreational catches estimated at 10–20% of total harvest, indicate that biomass is predicted to slowly decline. However, stock projections at 5-year average harvest indicate that biomass is predicted to remain stable [Johnson 2023]. Notwithstanding the former predicted declining trend at the highest catch scenario, but assuming the latter catch scenario of the 5-year average harvest rate, the above evidence indicates that the biomass of this stock is currently unlikely to be depleted and that recruitment is unlikely to be impaired.

In 2023, a Schaefer surplus production model (BSM) was fitted to commercial catch (1978–79 to 2021–22) and CPUE (1984–85 to 2021–22) using CMSY+ and BSM [Froese et al. 2019]. The main advantage of BSM compared to other implementations of surplus production models is its focus on informative priors and the acceptance of short and incomplete (= fragmented) CPUE data [See Froese et al. 2017 for full description]. Based on BSM analysis, mean biomass in the last year (1,270 t, CI: 1,010–1,510 t) is estimated to be lower than Bmsy (1,450 t), but greater than the lower 95% confidence interval of Bmsy (CI: 944 t). Estimates of fishing mortality (F) and exploitation rate (F/Fmsy) in 2021–22 were 0.07 (CI: 0.06–0.09) and 0.85 (CI: 0.57–1.48), respectively [Johnson 2023]. There is high uncertainty in the estimates of biomass depletion, harvest rate and MSY derived from catch data using Schaefer production model-assisted analysis, therefore results should be interpreted cautiously. The above evidence indicates that the current level of fishing mortality is unlikely to cause the stock to become recruitment impaired.

Particle dispersal modelling indicates a relatively high level of inter-jurisdictional connectivity for Giant Mud Crab, predominantly between Queensland and northern NSW [Hewitt et al. 2022]. The male-only harvest policy in Queensland likely provides a degree of stability in spawning biomass, which may support higher levels of recruitment for northern NSW estuaries that are well connected with spawning in Queensland waters [Hewitt et al. 2022; Taylor et al. 2023].

On the basis of the evidence provided above, the Estuary General Fishery (New South Wales) management unit is classified as a **sustainable stock**.

**Gulf of  
Carpentaria  
Queensland**

The commercial sector is estimated to take 88% of the Giant Mud Crab catch in the Gulf of Carpentaria (Queensland) Mud Crab Fishery (MCF) management unit [Northrop et al. 2019]. Therefore, classification of stock status for this management unit is primarily based on commercial harvest data.

Queensland has a male-only harvest policy. Female and sub-legal male crabs may be handled and released many times during their life, so some incidental fishing mortality is probable [Grubert and Lee 2013]. The Gulf of Carpentaria MCF management unit is a large area, with effort generally more dispersed compared to the East Coast (Queensland) MCF management unit. The Queensland no-take female harvest policy maximises the number of females that survive to spawn. The minimum legal size for males of 150 mm carapace width (CW) is greater than the male size-at-first maturity (functional), which is 130 mm CW and the size-at-50% maturity reported for the Northern Territory (146.4 mm CW) [Knuckey 1999].

Management of the fishery includes recreational possession and boat limits, restrictions on commercial licence numbers and fishing effort. Major recent changes to the management of the MCF include the introduction of vessel monitoring systems (VMS) on all commercial crab vessels from 1 January 2019,

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and the introduction of a Total Allowable Commercial Catch (TACC) and Individual Transferable Quota (ITQ) specific to the Gulf of Carpentaria (GC1) on the 1 September 2021. Escape vents in commercial crab pots became compulsory from this date. These changes altered patterns of fishing behaviour and reporting of harvest and need to be considered when interpreting trends in the catch time series. Additionally, the Gulf of Carpentaria is vulnerable to extreme climate events (e.g., extreme floods, prolonged droughts, lower than normal sea levels) which can result in mangrove dieback and declines in mud crab catches (e.g., 2015–16). Recruitment may be impacted by such events, and this should also be considered when interpreting catch trends [Robins et al. 2020].

The commercial catch in the 2021–22 year was 61.8 tonnes, noting the introduction of a TACC of 90.1 t (adjusted for a 10-month quota year) and ITQ on 1 September 2021. Northrup et al. (2019) used a simplified catch-MSY model to estimate that the Gulf of Carpentaria (Queensland) mud crab stock was likely to be at 58% of unfished levels in 2017–18 (range: 31 to 72%, assuming catch was 30% over-reported since the investment warning was issued for this fishery in 2003). The assessment supported a Gulf of Carpentaria TACC of 108 t (12-month fishing season = quota year). Since the introduction of VMS and ITQ, the reported mud crab commercial catch from the Gulf of Carpentaria (Queensland) MCF management unit has been significantly lower than in previous years. Ongoing monitoring of the commercial catch, which has improved data validation methods (i.e., quota reporting and compliance processes), should better indicate actual commercial harvest. The above evidence indicates that the biomass of the management unit is unlikely to be depleted and that recruitment is unlikely to be impaired.

Annual fishing effort in 2021–22 was 1,297 days fished by 19 active licences. There have been declining levels of effort over the past six years. Reasons for the decline in fishing effort are unvalidated but coincide with the introduction of VMS (1 January 2019) and ITQ (1 September 2021). The annual nominal catch rate (kg per day fished) increased from 29 kg per day in 2019–20 to 47.6 kg per day in 2021–22. The effects of changes in days fished and true retained catch levels on the fishing mortality rates of male crabs is not known. Brown [2010] estimated fishing mortality (assumed to be proportional to effort adjusted for trends in catchability due to technological change [Walters 2007]) in the Gulf of Carpentaria (Queensland) MCF management unit (based on commercial data to 2008) to be around 0.56. This estimate is lower than the estimated natural mortality rate ( $M = 1.2$ ) for Northern Territory stocks [Knuckey 1999] and supports inferences about the relatively light exploitation of male crabs at the scale of the management unit; notwithstanding the possibility of heavier fishing pressure in easily accessible areas. 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 Gulf of Carpentaria (Queensland) Mud Crab Fishery management unit is classified as a **sustainable stock**.

**Kimberley  
Developing  
Mud Crab  
Fishery**

The Kimberley Crab Managed Fishery (KCMF) targets the Giant Mud Crab (*Scylla serrata*) and the Orange Mud Crab (*S. olivacea*) in the remote northwest of Western Australia (WA). Estimates of the harvest of Mud Crabs by recreational fishers in the Kimberley zone of the North Coast Bioregion (120° Longitude east to the Northern Territory border) suggests the recreational harvest is similar to the commercial catch. WA is the only Australian jurisdiction to impose separate

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minimum size limits for Giant Mud Crab (150 mm CW) and Orange Mud Crab (120 mm CW). Although size at maturity estimates are currently unavailable for either species within this state, these metrics will be developed as part of a three-year FRDC project (2022-138 - Developing a Kimberley Aboriginal Mud Crab Fishery) due for completion in 2026. However, studies of their reproductive biology in other jurisdictions suggest that the two size limits allow a large proportion of each species to reach sexual maturity before harvest. Approximately 50% of male and 98% of female Giant Mud Crabs attain sexually maturity at 150 mm CW in the Northern Territory [Knuckey, 1999], while in Malaysian waters around 98% of both sexes of Orange Mud Crab mature at 120 mm CW [Ikhwanuddin et al. 2011].

Commercial fishing activity in the KCMF over the past decade has been sporadic, with annual effort ranging widely from approximately 300– 30,000 traplifts. While confidentiality provisions preclude the disclosure of catch figures for 2022 as they are based on data from less than three commercial operators, historic annual catches by the KCMF have yet to exceed 20 t. The annual standardised catch rate from the KCMF provides an index of abundance that can be used to assess this fishery's performance. The 2022 catch rate of 0.28 kg/traplift[-1] fell marginally below the limit reference point (0.29kg/traplift[-1]) of the preliminary harvest strategy [Johnston et al. 2020], initiating a review of the fishery. The low catch rate was considered to be due to the whole 2022 catch being landed by a new operator in the fishery who was acclimatising to fishing in the remote Kimberley region. Nevertheless, catch and effort in this fishery will be closely monitored in the near future.

Recreational catch for this individual management unit is calculated by multiplying the estimated number of retained crabs by regional average weights per crab [*S. serrata* - 1.061 kg, *S. olivacea* - 0.603 kg; Ryan et al. 2022]. The 2020–21 integrated survey of recreational boat-based fishing estimated the total state-wide recreational boat-based catch of Mud Crab to be 3 t (95% CI 1.0–4.9 t). Approximately 91% of this catch (*S. serrata* – 1.80 t, *S. olivacea* - 1.16 t) was taken in the North Coast Bioregion [Ryan et al. 2022].

The relatively small catch by commercial and recreational fishers and wide distribution of the species throughout the region suggest the biomass of this stock is unlikely to be depleted nor recruitment to be impaired.

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

**North West  
Northern  
Territory**

The North West Northern Territory (NWNT) management unit encompasses all NT waters outside of the Gulf of Carpentaria. This unit includes the Darwin region that supports a substantial non-commercial harvest of Mud Crabs. The estimates of the harvest by recreational and Indigenous fishers within the NWNT indicate that their combined take accounted for around 40% of the overall harvest within this management unit during 2000 - 2001 [Henry and Lyle 2003; Coleman 2004]. A more recent, non-Indigenous, resident-only angler survey confirmed the significance of the recreational harvest in this region (23%) [West et al. 2012]. However, a lack of recent annual catch estimates for recreational and Indigenous fishers means that the assessment presented here is primarily based on data from commercial logbooks.

The North West Northern Territory stock is assessed using a delay difference model, based on the model used in Grubert et al. [2019]. The previous

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assessment estimated the biomass in 2019 as a proportion of the biomass at Maximum Sustainable Yield ( $B_{2019}/B_{MSY}$ ) was 1.23, indicating that the stock is unlikely to be depleted and that recruitment is unlikely to be impaired. Furthermore, the same stock assessment estimated that fishing mortality in 2019 as a proportion of that to achieve MSY ( $F_{2019}/F_{MSY}$ ) was 0.8 indicating that overfishing is not occurring. Catch in 2019 was 106 t, and in 2022 catch was 76 t in this stock. This indicates that the catch has been relatively stable over time and within sustainable limits. An updated delay difference model with data to 2022 estimated that biomass as a proportion of the biomass at Maximum Sustainable Yield ( $B_{2022}/B_{MSY}$ ) was 1.17, indicating the biomass of the stock is unlikely to be depleted and recruitment is unlikely to be impaired. The estimated that fishing mortality in 2022 as a proportion of that to achieve MSY ( $F_{2019}/F_{MSY}$ ) was 0.63. Indicating that overfishing is not occurring.

On the basis of the evidence provided above, the North West Northern Territory management unit is classified as a **sustainable stock**.

**Western  
Gulf of  
Carpentaria**

The Western Gulf of Carpentaria management unit (WGOC) has accounted for more than 70% of the commercial harvest of Mud Crabs in the Northern Territory over the past 20 years. There are no records indicating the presence of Orange Mud Crab within this management unit [Keenan et al. 1998; Atlas of Living Australia 2021] so the catch of Mud Crabs in this region is assumed to consist entirely of Giant Mud Crab. A survey of Northern Territory anglers in 2009–10 estimated that the harvest of Giant Mud Crab by resident anglers within the WGOC is less than five per cent of the overall harvest of *Scylla* spp. by this sector across the Northern Territory [West et al. 2012]. However, the sporadic collection of recreational harvest data for this species within this management unit means that the assessment presented here is based on data from commercial logbooks.

In addition to fisheries impacts, the GOC has a unique environment that has had a recent period of drought Duke et al. [2017] and a series of extreme ocean warming events [Benthuisen et al. 2018]. The culmination of these factors probably contributed significantly to the commercial catch in 2016 declining to a low level (51 t) [NTG 2018]. However, this historical low catch was followed by a substantial increase in 2017 (185 t). This increase is attributed to above average rainfall during the 2016–17 monsoon season, recovery of juvenile nursery areas and a return to average sea surface temperatures that year [COA BOM 2017, IMOS 2018] highlighting the resilience of this species. Catch in the Western Gulf of Carpentaria stock was 263 t in 2022, an increase from 2019 (123 t), but still well below the historical peak (984 t in 2001). The Western Gulf of Carpentaria stock is assessed using a delay difference model [Grubert et al. 2019]. The previous assessment estimated the biomass in 2019 as a proportion of the biomass at Maximum Sustainable Yield ( $B_{2019}/B_{MSY}$ ) was 0.6.

The poor relative performance of the biomass indicator was likely driven by a combination of low rainfall and or river flows, high temperatures and sea level variations [Robins et al. 2020]. The same assessment estimated that fishing mortality in 2019 as a proportion of that to achieve MSY ( $F_{2019}/F_{MSY}$ ) was 0.73, indicating that overfishing was not occurring. An updated assessment estimated biomass in 2022 as a proportion of the biomass at Maximum Sustainable Yield ( $B_{2019}/B_{MSY}$ ) was 1.09, indicating that the biomass has increased above the target since 2019 after a series of La Niña events over successive wet seasons. The assessment also estimated that fishing mortality in 2022 as a proportion of that to achieve MSY ( $F_{2019}/F_{MSY}$ ) was 1.01, indicating that recruitment is not likely to become impaired.



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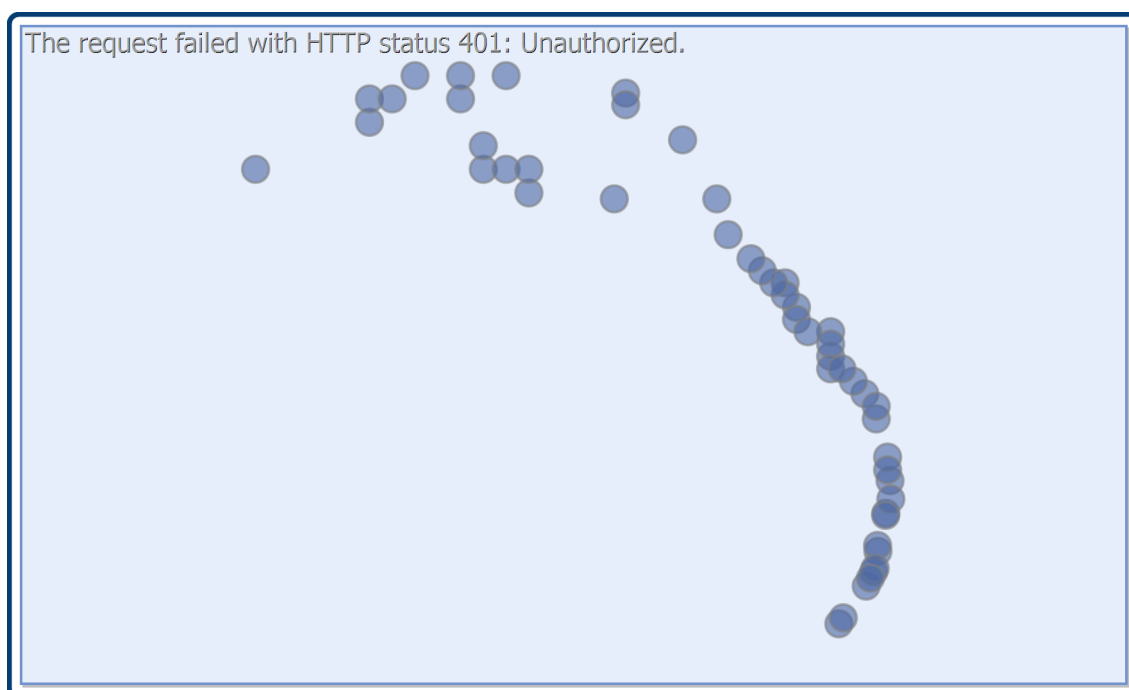
On the basis of the evidence provided above, the Western Gulf of Carpentaria management unit is classified as a **sustainable stock**.

**BIOLOGY**

**Giant Mud Crab biology** [Heasman 1980; Knuckey 1999; Butcher et al. 2003; Jebreen et al. 2008; Grubert and Lee 2013]

Species	Longevity / Maximum Size	Maturity (50 per cent)
MUD CRABS	3–4 years, 230 mm CW, but rarely exceeds 200 mm CW in most areas	Varies by sex and location but generally 120–150 mm CW

**DISTRIBUTION**



Distribution of reported commercial catch of Mud Crabs

**TABLES**

Fishing methods	New South Wales	Northern Territory	Queensland	Western Australia
<b>Charter</b>				
Rod and reel				✓
Traps and Pots	✓	✓	✓	
Unspecified				✓

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Commercial				
Crab Trap	✓	✓	✓	✓
Fish Trap	✓			
Mesh Net	✓			
Various	✓			
Recreational				
Beach Seine		✓	✓	
Cast Net		✓	✓	
Coastal, Estuary and River Set Nets		✓	✓	✓
Dip Net	✓	✓	✓	✓
Gillnets and entanglement nets	✓			
Hand collection	✓	✓	✓	✓
Hook and Line	✓	✓	✓	✓
Hoop Net	✓			
Spearfishing		✓	✓	
Traps and Pots	✓	✓	✓	
Unspecified				✓

Management Methods				
	New South Wales	Northern Territory	Queensland	Western Australia
Charter				
Bag/possession limits			✓	
Boat limits			✓	
Gear restrictions	✓		✓	✓
License				✓
Male-only harvest			✓	
Possession limit	✓			✓
Processing restrictions			✓	

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Seasonal or spatial closures			✓	
Size limit				✓
Size limits	✓		✓	
Spatial closures	✓			✓
<b>Commercial</b>				
Catch limits	✓			
Effort limits	✓	✓		✓
Gear restrictions	✓	✓	✓	✓
Harvest Strategy			✓	
Individual transferable quota			✓	
Limited entry	✓	✓	✓	✓
Male-only harvest			✓	
Protection of berried females	✓	✓		✓
Protection of soft-shelled crabs		✓		
Seasonal or spatial closures			✓	
Size limit	✓	✓		✓
Size limits			✓	
Spatial closures	✓	✓		✓
Spatial zoning	✓	✓		✓
Total allowable catch			✓	
Vessel restrictions			✓	
<b>Recreational</b>				
Bag limits				✓
Bag/possession limits			✓	
Boat limits			✓	

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<b>Gear restrictions</b>	✓	✓	✓	✓
<b>Male-only harvest</b>			✓	
<b>Possession limit</b>	✓	✓		
<b>Processing restrictions</b>			✓	
<b>Protection of berried females</b>	✓	✓		✓
<b>Seasonal or spatial closures</b>			✓	
<b>Size limit</b>	✓	✓		✓
<b>Size limits</b>			✓	
<b>Spatial closures</b>	✓	✓		✓
<b>Spatial zoning</b>	✓	✓		✓
<b>Vessel limits</b>		✓		✓

<b>Catch</b>				
	<b>New South Wales</b>	<b>Northern Territory</b>	<b>Queensland</b>	<b>Western Australia</b>
<b>Charter</b>		1.1 t	Unknown	0.78 t in Charter
<b>Commercial</b>	90.7671 t	349.325 t	596.684 t	0 t
<b>Indigenous</b>	Unknown	69 t (2000–01)	13 t (2000–01)	6 t (2000–01)
<b>Recreational</b>	21 t (2013–14)	24 t (2009–10)	160 t (2019–20) in East Coast MCF and Gulf of Carpentaria MCF	2.5 t North Coast (2015–16)

**Western Australia – Indigenous (Catch).** The estimate of the Indigenous harvest tonnage of Mud Crabs in Western Australia has been revised down as the weight multiplier previously used to calculate this value (1.34 kg per crab) is now considered unrealistically high given that the average weight of harvested Mud Crabs in Western Australia was recently estimated at 0.65 kg.

**Northern Territory – Charter (Management Methods).** In the Northern Territory, charter operators are regulated through the same management methods as the recreational sector but are subject to additional limits on license and passenger numbers.

**Northern Territory – Indigenous (Management Methods).** The Fisheries Act 1988 (NT), specifies that: “Unless expressly provided otherwise, nothing in this Act derogates or limits the right of Aboriginal people who have traditionally used the resources of an area of land or water in a traditional manner to continue to use those resources in that area in that manner.”

**Queensland – Indigenous (Management Methods).** For more information see <https://www.daf.qld.gov.au/business-priorities/fisheries/traditional-fishing>

**Queensland – Recreational Fishing (Catch).** Data are based at the whole of Queensland level and derived from statewide recreational fishing surveys. Where possible, estimates have been converted to weight (tonnes) using best known conversion multipliers. Conversion factors may display regional or temporal variability. In the absence of an adequate conversion factor, data presented as number of fish.

**Queensland – Commercial (Catch).** Queensland commercial and charter data have been sourced from the commercial fisheries logbook program. Further information available through the Queensland Fisheries Summary Report <https://www.daf.qld.gov.au/business-priorities/fisheries/monitoring-research/data/queensland-fisheries-summary-report>

**Queensland – Commercial (Management Methods).** Harvest strategies available at: <https://www.daf.qld.gov.au/business-priorities/fisheries/sustainable/harvest-strategy>

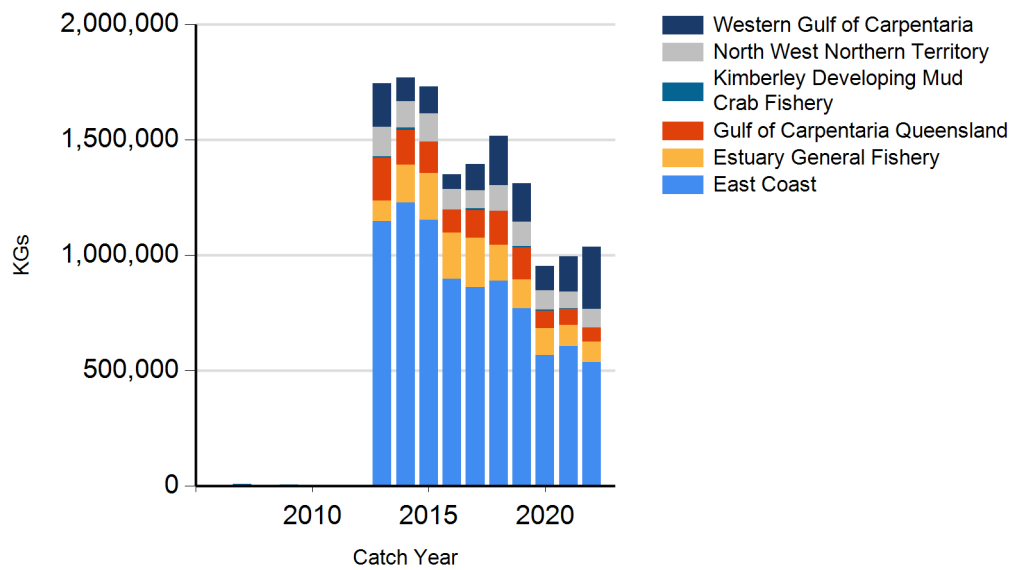
**New South Wales – Indigenous (Management Methods).** for more information please see <https://www.dpi.nsw.gov.au/fishing/aboriginal-fishing>

**New South Wales – Recreational (Catch).** For more information please see Murphy et al. [2022].

**Active Vessels.** The number of active exemption holders (for Western Australia), licences (for the Northern Territory and Queensland) or businesses (for New South Wales) are shown here because the number of active vessels is not an appropriate measure of effort in Australian Mud Crab fisheries. Licensing arrangements also vary significantly between jurisdictions.

## CATCH CHART

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Commercial catch of Mud Crabs - note confidential catch not shown

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