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Potential displacement of commercial fisheries by an Australian Marine Parks zoning scheme:

Report on recommended management plan zoning

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and Resource Economics and Sciences

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Summary

In 2012, the Australian Government proclaimed a set of new marine parks in the Coral Sea, North, North-west, South-west, and Temperate East regions around Australia. This report focuses on 44 marine parks within these regions. Most of these parks were newly proclaimed in 2012 while a small number of parks were already established but subject to zoning or boundary changes. In 2012 and 2013, the Director of National Parks prepared management plans for these parks. However, in 2014, these management plans were set aside and an independent review of the plans was commissioned. Following completion of this review, a statutory process to prepare new management plans for the 44 marine parks commenced. During 2017, new management plans were drafted encompassing the 44 marine parks and these were recommended to the Minister for the Environment and Energy by the Director of National Parks. The management plans set out zoning arrangements and rules for the 44 marine parks.

In order to understand the impacts of the recommended zoning, Parks Australia has commissioned the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) to assess the potential displacement of commercial fishing by the zoning configuration within the recommended management plans.

This ABARES report provides an assessment of the potential impact of the 2018 management plan zoning recommended by the Director of National Parks to the Minister for the Environment and Energy ('the 2018 zoning') and makes comparisons with the potential impact of the zoning proclaimed in November 2012 for Commonwealth marine parks ('the 2012 zoning'). The ABARES assessment includes potential displacement of commercial fisheries' catch and gross value of production (GVP), the magnitude of impacts to individual fishing entitlements, the flow of impacts to ports and an estimate of the potential impacts to jobs and regional economies. The latter is extrapolated from economic modelling and surveys undertaken in 2012 (including ABARES 2012 a, b, c). ABARES was not commissioned to undertake new economic modelling or conduct additional surveys.

This January 2018 report updates a similar report released in July 2017 that examined the 2017 draft zoning for Australian Marine Parks that was proposed by the Director of National Parks at that time but not implemented. Changes to proposed zoning between July 2017 and now have been minor and so changes to fisheries displacement are very similar to the earlier report.

The assessment is based on data collected in fisheries logbooks for South Australian, Western Australian, Northern Territory, Queensland, New South Wales and Commonwealth fisheries. Potential displacement calculations are based on catches between 2007–08 and 2013–14 for the Commonwealth, South Australia, Northern Territory, Queensland and New South Wales, and 2007 and 2013 for Western Australia¹. These data are collected at a variety of spatial scales in each of the jurisdictions from one degree latitudinal bands, through to the position for each

¹ The South-east Commonwealth Marine Parks Network is not included in the review. This network was created in 2007 and the management plan for the network is in operation. As such, Victorian and Tasmanian fisheries are not included in the analyses.

fishing operation. A range of methods were used to improve the accuracy of the displacement estimates however some clear caveats remain (see Methods).

Potential short term employment impacts were estimated two different and independent ways; one from rescaling previous economic modelling and one from rescaling estimates derived from earlier survey results. Job losses were separately estimated at 17 full time jobs (from previous economic modelling) and 45 jobs (from previous surveys of fishers). Changes in economic activity at the state / territory level are expected to be negligible in terms of the size of the economies.

Key findings

We find potential displacement of commercial fisheries by the 2018 zoning is relatively small compared to the total gross value of production (GVP) from all wild capture fisheries nationally (0.3 per cent) and relative to all fishing within the marine reserve boundaries (5.4 per cent). However, while much of the total impact is diffuse, some of the potential displacement is concentrated on particular fisheries, entitlements and towns.

The following findings pertain to the 2018 zoning. All estimates are expressed as average annual potential displacement, for the seven year fishery data reference period (2007–08 to 2013–14 for the Commonwealth, South Australia, Northern Territory, Queensland and New South Wales, and 2007 to 2013 for Western Australia).

- The 2018 zoning would potentially displace an estimated annual average 544 t of catch, with an annual average GVP of \$4.12 million (Table 1). This is less than the implementation impact of the 2012 zoning which would displace an estimated 1032 t of catch, with a GVP of \$8.2 million (Table 1).
- The estimated net economic impact of the 2018 zoning would be to reduce regional economic activity of \$7.2 million in the short term.
- For individual entitlements, the vast majority face relatively small potential displacements by the 2018 zoning. Over 700 entitlements would have less than \$2500 displaced per year (Figure 1). A smaller number of entitlements face higher potential impacts; 25 entitlements with between \$25 000 and \$50 000 and 15 entitlements over \$50 000 per year. These figures do not include South Australian entitlements because ABARES did not have access to data at this scale for South Australian fisheries. Note that a single business unit may hold multiple entitlements and so the impact on a business unit would be the sum of the individual entitlement impacts.
- The largest volume displacements of catch would be from the Commonwealth Eastern Tuna and Billfish Fishery (89.5 t), the Western Australian/Commonwealth Joint Authority Southern Demersal Gillnet and Demersal Longline Fishery (67.6 t) and the Commonwealth Gillnet, Hook and Trap Sector of the Southern and Eastern Scalefish and Shark Fishery (41.8 t).
- The largest value (GVP) displacements at the fishery level would be in the Western Australian West Coast Rock Lobster Fishery (\$823 000), the Commonwealth Eastern Tuna and Billfish Fishery (\$480 900) and the Western Australian/Commonwealth Joint Authority Southern Demersal Gillnet and Demersal Longline Fishery (\$361 900).
- In terms of the proportion of catch from the entire fishery, the largest displacements would be from the Commonwealth Coral Sea Fishery (65.4 per cent of fishery catch by volume), the Western Australian/Commonwealth Joint Authority North Coast Shark

Commercial fishing displacement under the 2018 management plan zoning

Fishery (30.6 per cent) and the Western Australian South West Trawl Fishery (13.2 per cent).

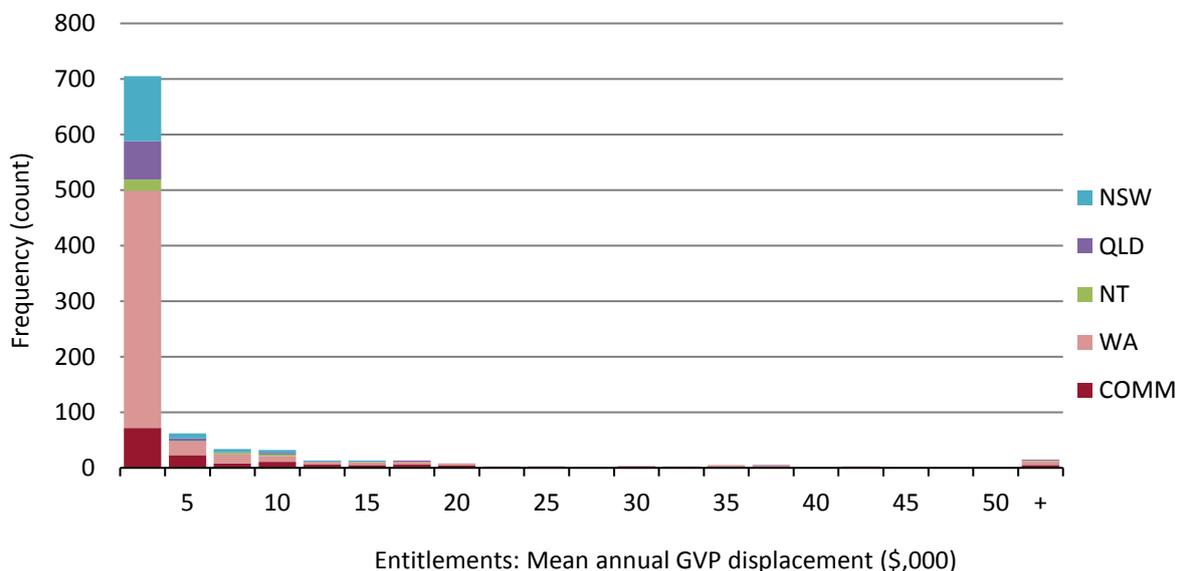
- Towns with the highest potential GVP displacement were Mooloolaba in Queensland (\$476 200), Geraldton in Western Australia (\$449 200) and Esperance in Western Australia (\$350 800). There were 11 towns where the potential GVP displacement was greater than \$100 000. The majority of ports (75) had less than \$5000 of potentially displaced GVP flowing to them.
- The operating ports for the higher impacted entitlements (>\$25 000 GVP displaced) in descending order of number of higher impact entitlements per port were: Geraldton (WA); Kalbarri (WA); Mooloolaba (QLD); Fremantle (WA); Esperance (WA); Abrolhos (WA); Karumba (QLD); Cairns (QLD); Darwin (NT); and Quindalup (WA). This is similar to the list of towns with the largest amount of displaced GVP flowing to them.

Table 1: Estimated displacement by the 2012 and 2018 zoning

	CATCH			GVP		
	2012 zoning	2018 zoning		2012 zoning	2018 zoning	
	Tonnes	Tonnes	Percent of jurisdiction wild catch ¹	\$'000	\$'000	Percent of jurisdiction wild GVP ¹
Total	1,032.4	544.2	0.4	8,201.4	4,122.2	0.3

¹ Percentages in this table are calculated on the basis of 2013–14 wild catch fisheries production for the relevant jurisdictions: Commonwealth, South Australian, Western Australian, Northern Territory, Queensland and New South Wales fisheries (ABARES 2015).

Figure 1: Potential GVP displacement by individual entitlement: 2018 zoning network



Note: South Australia is not included in this analysis because ABARES did not receive fisheries data at this scale for South Australian fisheries

Methods

Fisheries data processing methods

This assessment is based on fisheries logbook data for South Australian, Western Australian, Northern Territory, Queensland, New South Wales and Commonwealth fisheries². Logbook data are reported at various spatial scales, from shot-by-shot (each fishing operation) to one degree latitudinal bands (Table 2). A range of processing methods were applied to refine data where operations were recorded on coarse reporting grids (*Appendix A: Estimation methods*). Methods used were taken from the suite of methods described in DSEWPac (2013). With the exception of South Australia, all jurisdictions provided ABARES with vessel level data.

Displacement of fishing was estimated from the recent (historic) catch that occurred within the marine parks that would be displaced based on the permitted fishing activities within the different zoning types (*Appendix A: Gear/Zone tables*). Catch volume was converted to GVP using data on beach prices.

Table 2: Spatial resolution of fisheries data for each jurisdiction

Jurisdiction	Spatial resolution
Commonwealth	Shot-by-shot positions
South Australia	60 minute grid
Western Australia	5 minute, 10 minute, 60 minute grids
Northern Territory	Shot-by-shot positions
Queensland	6 minute, 30 minute grids
New South Wales	6 minute grid, one degree latitudinal bands

Port flows

The flow of potentially displaced catch to ports was derived from a variety of data sources depending on the information available for each jurisdiction (Table 3). The port of catch unloading was preferred where available and this was sourced from catch disposal records (collected by the fisheries management agency) or from landings information reported by fishers. Where these data were not available, ABARES used a range of alternative approaches that are described in Table 3. Flow of potentially displaced catch to ports was used as a measure of the potential impact of the alternative marine park networks on towns and coastal communities.

² The South-east Commonwealth Marine Parks Network is not included in the review. This network was created in 2007 and the management plan for the network is in operation. As such, Victorian and Tasmanian fisheries are not included in the analyses.

Table 3: Data sources for estimation of the flow of catch and GVP to ports

Jurisdiction	Basis for GVP attribution to towns
Commonwealth	Landing location (catch disposal records) or vessel home port
South Australia	Derived from survey of commercial fishers (ABARES 2012a).
Western Australia	Reported landing locations
Northern Territory	Consultation, Northern Territory Seafood Council (NTSC) fishery profiles and proximity of fishing operations to major ports
Queensland	Report: <i>A guide to the fishers of Queensland</i> Fenton & Marshall (2001)
New South Wales	Reported landing locations or vessel home port

Economy and jobs

ABARES was not commissioned to undertake new economic modelling of the impacts to regional economies and employment. However, estimated impacts on regional economies and jobs of the 2012 zoning were estimated in 2012 using two, independent methodologies: *economic modelling* and the *survey* of fishing businesses (see for example ABARES 2012a, b, c). Results from these methodologies have been extrapolated for the 2018 zoning. The 2012 economic modelling targeted specific regions where potential impacts were and then scaled to account for the total GVP potentially displaced under the 2012 zoning. The results from the 2012 modelling have been rescaled for the displaced GVP estimated for the 2018 zoning. The results presented here include estimates from the affected regions but do not include estimates from total state and national economies because these were previously assessed as negligible relative to the size of those economies.

Independent of the economic modelling, potential job losses from the commercial fisheries' catching and processing sectors were estimated based on an extrapolation of responses to 2012 surveys of fishing businesses (see for example ABARES 2012a, b, c).

Notes and caveats

Adapted from ABARES 2012(a, b, c, d, e).

- Tabular and graphical results for the 2012 zoning are presented in grey to assist readers in identifying they relate to the previous zoning scheme.
- GVP is a relatively simple aggregate measure of the level of commercial fishing activity. More complete measures of the impact of area closures are discussed elsewhere (for example ABARES 2012a, b, c, d, e).
- The use of historical GVP information to estimate the impact on future fishing activities (that is, the opportunity cost) should be interpreted with caution. This is because GVP will vary with market demand, inflation, exchange rates and the reference period of analysis. Potential displacement estimates may not incorporate the impact of historical or long-term cyclical fluctuations in fish stocks, and ignores potential future harvests.
- GVP is the assessed value of commercial fishery products at the point of landing for the quantity produced and excludes the cost of transporting, processing and marketing of fish

Commercial fishing displacement under the 2018 management plan zoning

products for wholesale and retail markets. It does not take into account flow-on effects, such as value-adding and other potential benefits to individuals and communities.

- Potential displacement estimates are given as annual means spanning up to seven years. Catches in the most recent years may have been higher or lower than the mean.
- Potential displacement calculations were based on historical catches as reported in fisheries logbooks from the following seven year reference periods: 2007–08 to 2013–14 for the Commonwealth, South Australia, Northern Territory, Queensland and New South Wales, and 2007 to 2013 for Western Australia.
- All GVP figures reported are adjusted to end of June 2015 values. Where updated beach prices were readily available from jurisdictions, these were used, however updated prices were only available for Commonwealth and New South Wales fisheries. For the other jurisdictions prices as published in DSEWPaC (2013) were used. These have been adjusted to end of June 2015 values using the consumer price index.
- The estimates use data at different spatial reporting scales depending on the jurisdiction and fishery, and have correspondingly different accuracy when assessing the displacement of fishing.
- The reduction in total GVP following closures of a particular fishing ground is likely to be less than the historical GVP associated with catches in those grounds. Fishers may be able to move to alternative fishing grounds and maintain a similar level of activity, catch and viability of their operations. This may not be the case in some fisheries, and will depend on a number of potentially interrelated factors such as economics, distance to port facilities, management arrangements, availability of target species and the suitability of fishing grounds in adjacent areas.
- Displaced GVP is not directly equivalent to the likely cost of any structural adjustment assistance that may occur.
- Some marine park zones in both the 2012 and the 2018 zonings are small in area relative to the resolution of spatial reporting grids of fisheries data. In these cases potential displacement estimates are not likely to be accurate and results presented for these small zones should be treated with caution.
- Potential displacement of aquarium fishing in the Coral Sea is reported, however GVP was not calculated due to a lack of landings price data for aquarium specimens.
- This report provides analysis of potential displacement to individual fishing entitlements. An entitlement is not necessarily equivalent to an individual or fishing business. For example, one business may hold several separate entitlements in one or more fisheries within a jurisdiction, or entitlements across several jurisdictions. ABARES does not hold data to be able to aggregate these separate entitlements. As such, there may be cases where an individual / business has a combined displacement larger than what is reported here. ABARES did not have access to vessel level data from South Australia and therefore the analyses of entitlements do not include South Australian fisheries.

Results

Displacement of fishing

2018 zoning

The 2018 zoning has the potential to displace an estimated annual average of 544.2 tonnes of catch with a corresponding GVP of \$4.12 million (Table 4). This represents 0.3 per cent of the total GVP from all wild capture fisheries nationally and 5.4 per cent of GVP from fishing activity within the marine park boundaries.

The jurisdictions with the largest potentially displaced catch and GVP are the Commonwealth (204.1 t; \$1.43 million) and Western Australia (185.5 t; \$1.89 million). The marine regions with the largest potentially displaced catch and GVP (Table 5) are the South-west (177.3 t; \$2.03 million) and the North (141.3 t; \$0.75 million).

In terms of individual marine parks, the largest potential GVP displacement by the 2018 zoning comes from the Abrolhos (\$879 300; South-west Marine Region), Coral Sea (\$604 200), Central Eastern (\$358 700; Temperate East) and South-west Corner (\$278 000; South-west Marine Region; Table 6). Together these four marine parks account for over half of the potential displacement of GVP by the 2018 zoning.

Fishery level potential displacements are provided by jurisdiction and marine park scenario in Appendix B. The fisheries with the largest potential catch displacement by the 2018 zoning are the Commonwealth Eastern Tuna and Billfish Fishery (89.5 t), the Western Australian/Commonwealth Joint Authority Southern Demersal Gillnet and Demersal Longline Fishery (67.6 t) and the Commonwealth Gillnet, Hook and Trap Sector of the Southern and Eastern Scalefish and Shark Fishery (41.8 t).

The fisheries with the largest potential GVP displacement by the 2018 zoning are the Western Australian West Coast Rock Lobster Fishery (\$823 000), the Commonwealth Eastern Tuna and Billfish Fishery (\$480 900) and the Western Australian/Commonwealth Joint Authority Southern Demersal Gillnet and Demersal Longline Fishery (\$361 900).

2012 zoning

The 2012 zoning would displace an estimated annual average of 1032.4 tonnes of catch with a GVP of \$8.20 million (Table 4). The jurisdictions with the largest potentially displaced catch and GVP are the Commonwealth (635.2 t; \$5.10 million) and Western Australia (206.5 t; \$2.03 million). The marine region with the largest potentially displaced catch and GVP (Table 5) is the Coral Sea (457.3 t; \$3.14 million).

In terms of individual marine parks, the largest potential GVP displacement by the 2012 zoning comes from the Coral Sea (\$3.14 million), Gulf of Carpentaria (\$1.32 million; North), Abrolhos (\$0.88 million; South-west) and Central Eastern (\$0.35 million; Temperate East) marine parks (Table 6). Together these four marine parks account for 70 per cent of the potential displacement by the 2012 zoning.

The fisheries with the largest catch and GVP displacements by the 2012 zoning are the Commonwealth Eastern Tuna and Billfish Fishery (441.3 t; \$3.01 million) and Northern Prawn Fishery (102.4 t; \$1.41 million).

Comparison

Overall, the potential displacement of catch and GVP would be smaller with the introduction of the 2018 zoning compared with the 2012 zoning (Table 4). New South Wales is the only jurisdiction where the potential catch and GVP displacements by the 2018 zoning were larger than under the 2012 zoning. However, these increases are small relative to the displacement of the whole network.

The estimated displacement from South Australian fisheries has not changed between the 2012 and the 2018 zoning. This is because there were only minor changes adjacent to South Australia, none of which changed the estimated impact on South Australian fisheries.

The relative GVP displacement between the regions has changed between the 2012 and 2018 zonings (Table 5). The 2012 zoning for the Coral Sea marine park accounted for 38 per cent of the total displacement, while it accounts for only 15 per cent of the 2018 zoning. As a result of this, the South-west Marine Region in the 2018 zoning accounts for a larger proportion of the total potential displacement (changing from 26 to 49 per cent).

The 2018 zoning would increase potential displaced catch relative to the 2012 zoning in 15 marine parks, decrease it in 14 and make no change in 15 (Table 6).

Generally, the marine parks with the greatest potential GVP displacement were the same under either scenario. However, the displacement from the Gulf of Carpentaria Marine Park in the North Marine Region was substantially reduced (from second highest in the 2012 zoning, to ninth highest in the 2018 zoning; Table 6).

Commercial fishing displacement under the 2018 management plan zoning

Table 4: Potential commercial fisheries' catch and GVP displacement by jurisdiction for the 2012 and 2018 zoning

	CATCH			GVP		
	2012 zoning	2018 zoning		2012 zoning	2018 zoning	
	Tonnes	Tonnes	Percent of jurisdiction wild catch ¹	\$'000	\$'000	Percent of jurisdiction wild GVP ¹
Commonwealth	635.2	204.1	0.5	5,096.3	1,428.1	0.4
South Australia	9.5	9.5	<0.1	135.9	135.9	0.1
Western Australia	206.5	185.5	1.0	2,031.3	1,887.2	0.5
Northern Territory	82.8	80.4	1.5	192.0	184.2	0.6
Queensland	76.4	38.6	0.2	564.3	282.9	0.1
New South Wales	22.0	26.1	0.2	181.5	203.9	0.2
Total	1,032.4	544.2	0.4	8,201.4	4,122.2	0.3

¹ Percentages in this table are calculated on the basis of 2013–14 wild catch fisheries production for the relevant jurisdictions: Commonwealth, South Australian, Western Australian, Northern Territory, Queensland and New South Wales fisheries (ABARES 2015).

Table 5: Potential commercial fisheries' catch and GVP displacement by marine region for the 2012 and 2018 zoning

Region	CATCH (tonnes)		GVP (\$,000)	
	2012 zoning	2018 zoning	2012 zoning	2018 zoning
South-west	188.9	177.3	2,119.2	2033.7
North-west	53.7	47.6	287.0	208.6
North	261.4	141.3	2,097.4	749.8
Coral Sea	457.3	107.6	3,143.8	604.2
Temperate East	71.1	70.3	554.1	525.8
Total	1,032.4	544.2	8,201.4	4,122.2

Commercial fishing displacement under the 2018 management plan zoning

Table 6: Potential commercial fisheries' catch and GVP displacement by marine park for the 2012 and 2018 zoning

Marine park	CATCH (tonnes)		GVP (\$,000)	
	2012 zoning	2018 zoning	2012 zoning	2018 zoning
South-west region				
Southern Kangaroo Island	0.0	0.0	0.0	0.0
Western Kangaroo Island	0.7	0.7	10.4	10.4
Western Eyre	18.0	18.0	167.9	168.0
Murat	2.6	3.1	27.3	30.3
Great Australian Bight	11.9	11.9	64.7	64.7
Twilight	26.0	15.1	256.5	174.0
Eastern Recherche	19.8	19.5	134.1	132.0
South-west Corner	43.1	37.0	340.7	278.0
Bremer	10.9	14.7	62.9	95.7
Geographe	4.8	5.2	23.8	25.2
Two Rocks	10.2	10.9	95.2	114.2
Jurien	0.5	0.5	17.8	17.8
Perth Canyon	4.0	4.4	38.5	44.2
Abrolhos	36.3	36.3	879.3	879.3
North-west region				
Shark Bay	2.1	2.1	11.5	11.5
Gascoyne	0.4	0.4	2.7	2.7
Carnarvon Canyon	0.0	0.0	0.0	0.0
Ningaloo	3.7	3.7	32.1	32.1
Montebello	0.0	0.0	0.2	0.2
Dampier	3.6	0.7	26.9	5.6
Eighty Mile Beach	3.4	3.4	23.8	23.8
Mermaid Reef	0.1	0.1	1.3	1.3
Argo-Rowley Terrace	2.1	0.8	56.5	19.9
Roebuck	0.0	0.0	0.1	0.2
Kimberley	38.0	36.1	129.6	109.2
Cartier Island	0.2	0.2	2.3	2.3
Ashmore Reef	0.0	0.0	0.0	0.0
North region				
Joseph Bonaparte Gulf	6.2	6.4	49.8	50.1
Oceanic Shoals	45.4	44.2	156.3	166.9
Arafura	15.6	15.2	112.8	108.1
Arnhem	16.5	16.9	32.4	33.1
Wessel	16.3	10.6	71.6	39.1
Limmen	4.9	4.9	18.1	18.1
Gulf of Carpentaria	106.6	13.7	1,318.2	137.4
West Cape York	49.9	29.5	338.3	197.1
Coral Sea	457.3	107.6	3,143.8	604.2
Temperate East region				
Solitary Islands	0.8	0.9	7.2	7.6
Cod Grounds	0.1	0.1	0.4	0.4
Hunter	7.9	10.8	54.7	70.7
Central Eastern	41.2	42.3	352.7	358.7
Gifford	0.1	0.1	1.0	1.0
Lord Howe	9.7	8.1	79.4	48.6
Norfolk	10.1	6.5	54.5	34.1
Jervis	1.3	1.5	4.3	4.8
Grand Total	1,032.4	544.2	8,201.4	4,122.2

Port flows

The flow of potentially displaced catch to ports was used as a measure of the potential impact of alternative marine park networks on towns and coastal communities.

2018 zoning

The catch and GVP potentially displaced by the 2018 zoning flowed to over 100 ports. Most ports (75) had less than \$5000 of potentially displaced annual average GVP flowing to them (Figure 2) and of these, 51 ports had less than \$1000 flowing to them. Eleven ports had over \$100 000 of potentially displaced catch flowing to each of them (Table 7) with the highest three being Mooloolaba (QLD), Geraldton (WA) and Esperance (WA).

2012 zoning

The catch potentially displaced by the 2012 zoning flowed to over 100 ports. Most ports (70) had less than \$5000 displaced annual average GVP flowing to them (Figure 3) and of these, 33 ports had less than \$1000 flowing to them. Eleven ports had over \$100 000 of displaced catch flowing to each of them (Table 8) with the highest three being Cairns (QLD), Fremantle (WA) and Mooloolaba (QLD).

Comparison

A similar number of ports are estimated to be impacted by each network scenario, with a similar pattern where the majority of ports have small flows of displaced catch and a small number of ports accounting for a large share of displaced catch.

The larger overall potential displacement under the 2012 zoning results in larger potential displacement flows to individual ports. The largest flows of potentially displaced GVP from the 2012 zoning would be \$2.77 million to Cairns (QLD) and \$0.78 million to Fremantle (WA; Table 8), compared with the largest flows of potentially displaced GVP under the 2018 zoning of \$0.48 million to Mooloolaba (QLD) and \$0.45 million to Geraldton (WA; Table 7). The substantially reduced flow to Cairns (QLD) under the 2018 zoning is largely a result of reduced potential displacement from the Commonwealth Eastern Tuna and Billfish Fishery.

Figure 2: Annual average GVP (\$'000) flows to ports for the 2018 zoning

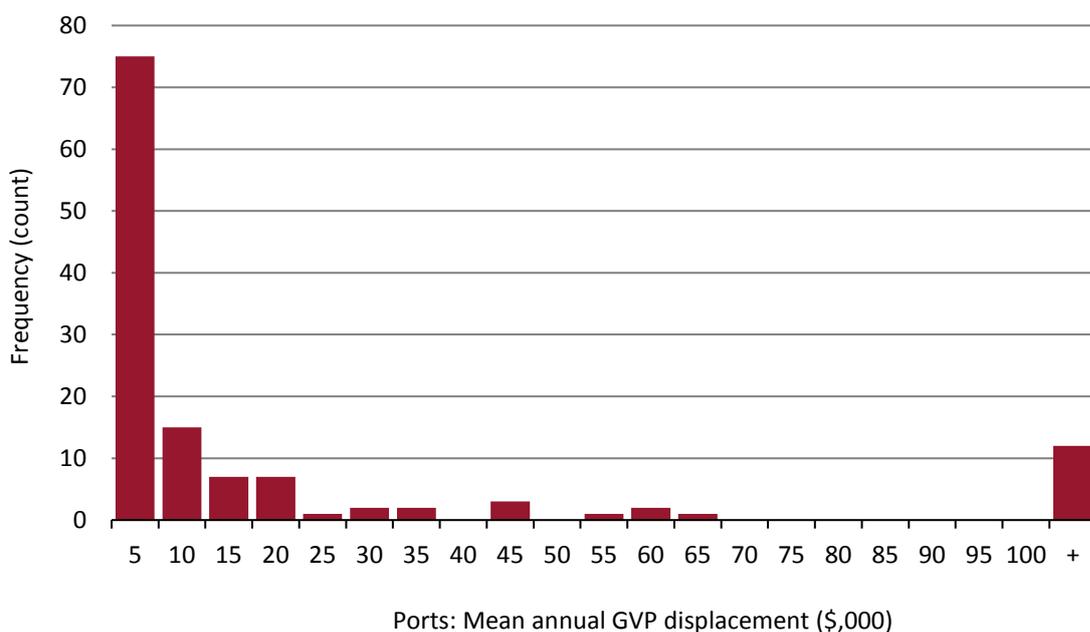


Table 7: Flows of potentially displaced catch and GVP to ports, 2018 zoning (top 20 displacements by GVP)

Town (state)	Catch (t)	GVP (\$'000)
Mooloolaba (QLD)	83.6	476.2
Geraldton (WA)	21.9	449.2
Esperance (WA)	48.4	350.8
Fremantle (WA)	24.1	300.3
Kalbarri (WA)	10.3	296.0
Darwin (NT)	107.7	275.9
Karumba (QLD)	31.4	222.0
Cairns (QLD)	33.4	213.7
Coffs Harbour (NSW)	14.7	138.1
Tuncurry (NSW)	20.0	123.5
Eucla (WA)	7.7	113.9
Brisbane (QLD)	6.8	64.9
Broome (WA)	14.9	57.9
Streaky Bay (SA)	9.8	57.6
Albany (WA)	10.7	52.1
Cowaramup (WA)	4.7	41.0
Port Lincoln (SA)	8.1	40.3
North Island (WA)	1.1	40.1
Abrolhos (WA)	0.9	32.8
Bunbury (WA)	6.5	31.9

Figure 3: Annual average GVP (\$'000) flows to ports for the 2012 zoning

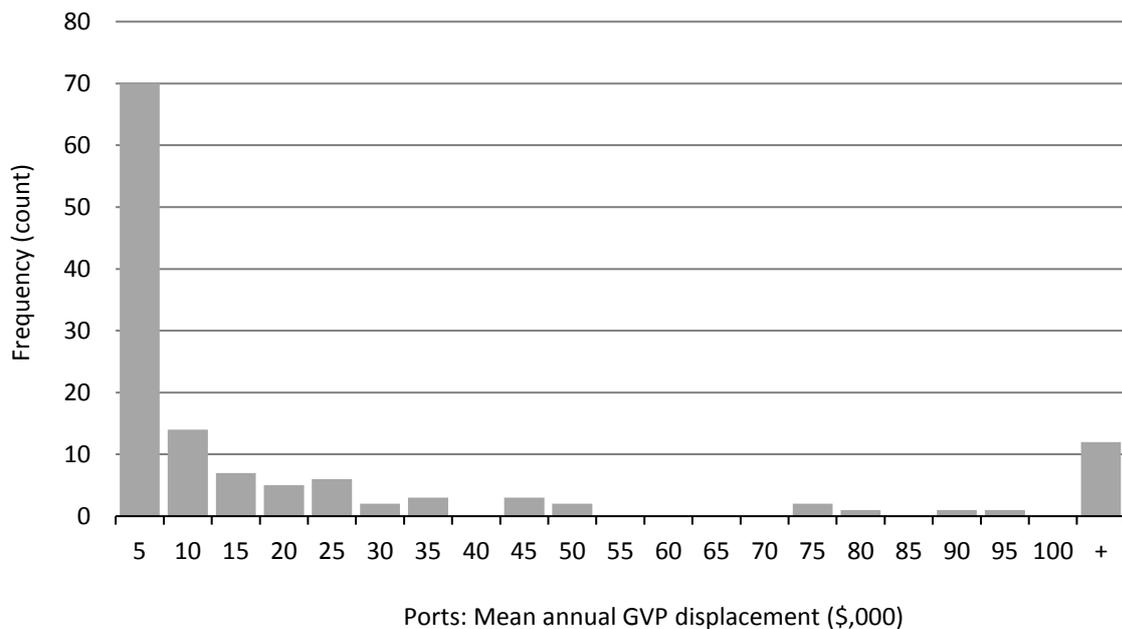


Table 8: Flows of potentially displaced catch and GVP to ports, 2012 zoning (top 20 displacements by GVP)

Town (state)	Catch (t)	GVP (\$'000)
Cairns (QLD)	341.0	2 771.1
Fremantle (WA)	58.9	776.8
Mooloolaba (QLD)	136.1	697.8
Geraldton (WA)	26.5	521.3
Karumba (QLD)	62.9	446.8
Esperance (WA)	52.5	372.5
Darwin (NT)	116.0	318.2
Brisbane (QLD)	24.2	306.1
Kalbarri (WA)	10.3	296.0
Eucla (WA)	13.0	158.7
Coffs Harbour (NSW)	12.9	130.6
Port Lincoln (SA)	11.1	90.5
Albany (WA)	13.8	86.4
Tuncurry (NSW)	12.4	79.5
Broome (WA)	16.2	72.3
Streaky Bay (SA)	10.9	71.2
Weipa (QLD)	6.7	48.1
Forster (NSW)	7.4	46.5
Gladstone (QLD)	8.3	43.9
Cowaramup (WA)	4.7	41.0

Entitlements

Analysis of the potential displacement of fisheries entitlements was possible for all jurisdictions except South Australia. Hence, the findings reported in this section do not include South Australia. Fisheries entitlement identifiers varied across jurisdictions but were generally an identifier of the fishing permit or fishing vessel. It is important to note that a single fishing business unit may be associated with multiple entitlements and so the potential impact to a single business unit would be the sum of the individual entitlement impacts. The actual number of business units impacted would be lower than the counts of entitlements reported here and accordingly the potential displacements for some business units would be larger.

Analysis of impacts at the level of business units would require detailed information on the ownership of entitlements as well as individual business structures—these data were not available to ABARES.

2018 zoning

The catch of over 900 entitlements would potentially be displaced by the 2018 zoning. The largest numbers of entitlement were from Western Australian (520 entitlements) and Commonwealth fisheries (153; Figure 4). The majority of entitlements (705) had less than \$2500 potential annual average displacement (Figure 4) and of these, the majority had less than \$500. There are a large number of Western Australian entitlements with very small impacts (Figure 4).

Commercial fishing displacement under the 2018 management plan zoning

There are however a small number of entitlements with relatively large potential GVP displacement; 25 with displacements between \$25 000 and \$50 000 and 15 with displacement over \$50 000. The largest displacement from a single entitlement was \$163 500.

The operating ports for the higher impacted entitlements (>\$25 000 GVP displaced per) in descending order of number of higher impact entitlements per port were: Geraldton (WA); Kalbarri (WA); Mooloolaba (QLD); Fremantle (WA); Esperance (WA); Abrolhos (WA); Karumba (QLD); Cairns (QLD); Darwin (NT); and Quindalup (WA).

2012 zoning

The catch of over 900 entitlements would potentially be displaced by the 2012 zoning. The largest numbers of entitlement were from either Western Australian (538 entitlements) or Commonwealth fisheries (163; Figure 5). The majority of entitlements (702) had less than \$2500 potential annual average displacement (Figure 5) and of these, the majority (535) had less than \$500.

There are a small number of entitlements with relatively large potential GVP displacement; 39 with displacements of between \$25 000 and \$50 000 and 32 with displacement over \$50 000. Under the 2012 zoning there were three Commonwealth fisheries entitlements with potential displacements in excess of \$450 000.

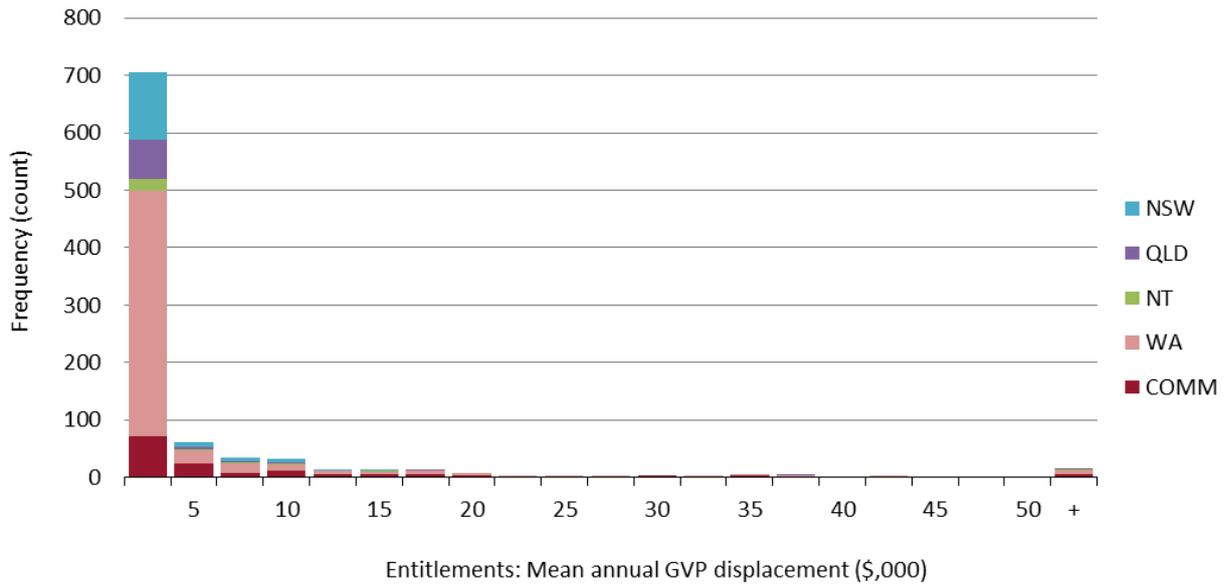
Comparison

The overall pattern of individual entitlements generally having a small displacement is consistent between the two networks. The number of entitlements with displacement was reduced for all jurisdictions apart from the Northern Territory and New South Wales. In both scenarios, the largest number of entitlements impacted for each \$2500 displacement category (0-\$2499; \$2500-\$4999; etcetera) came from Commonwealth or Western Australian entitlements.

The number of higher impacted entitlements (\$25 000 or more) reduced from the 2012 zoning (71) to the 2018 zoning (40).

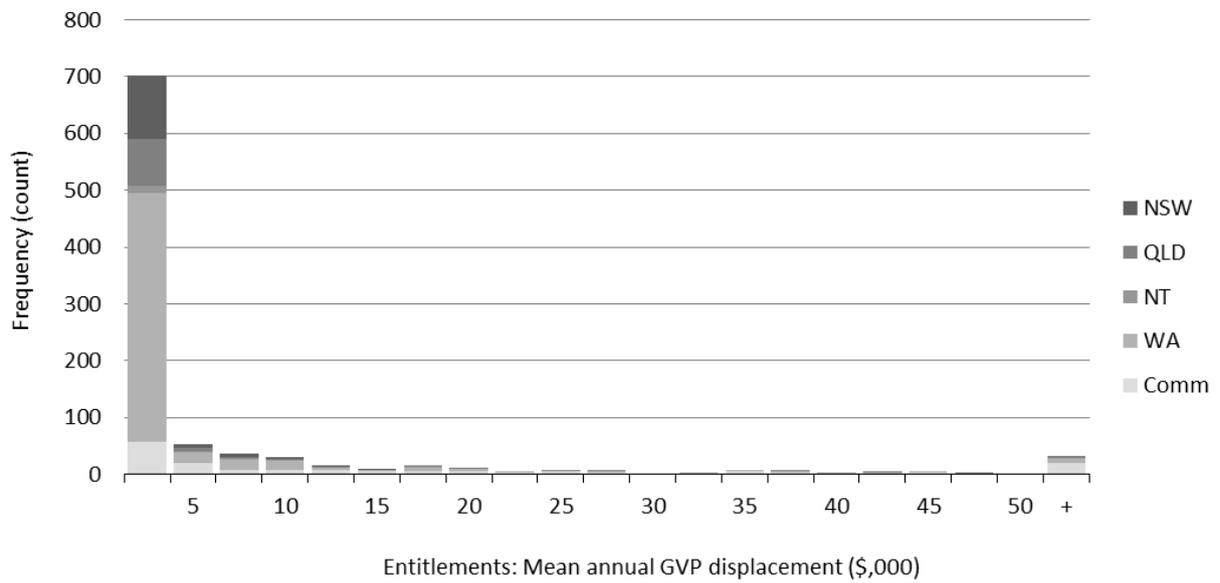
Commercial fishing displacement under the 2018 management plan zoning

Figure 4: Potential GVP displacement by entitlement: 2018 zoning network



Note: South Australia is not included in this analysis because ABARES did not receive fisheries data at this scale for South Australian fisheries

Figure 5: Potential GVP displacement by entitlement: 2012 zoning



Note: South Australia is not included in this analysis because ABARES did not receive fisheries data at this scale for South Australian fisheries

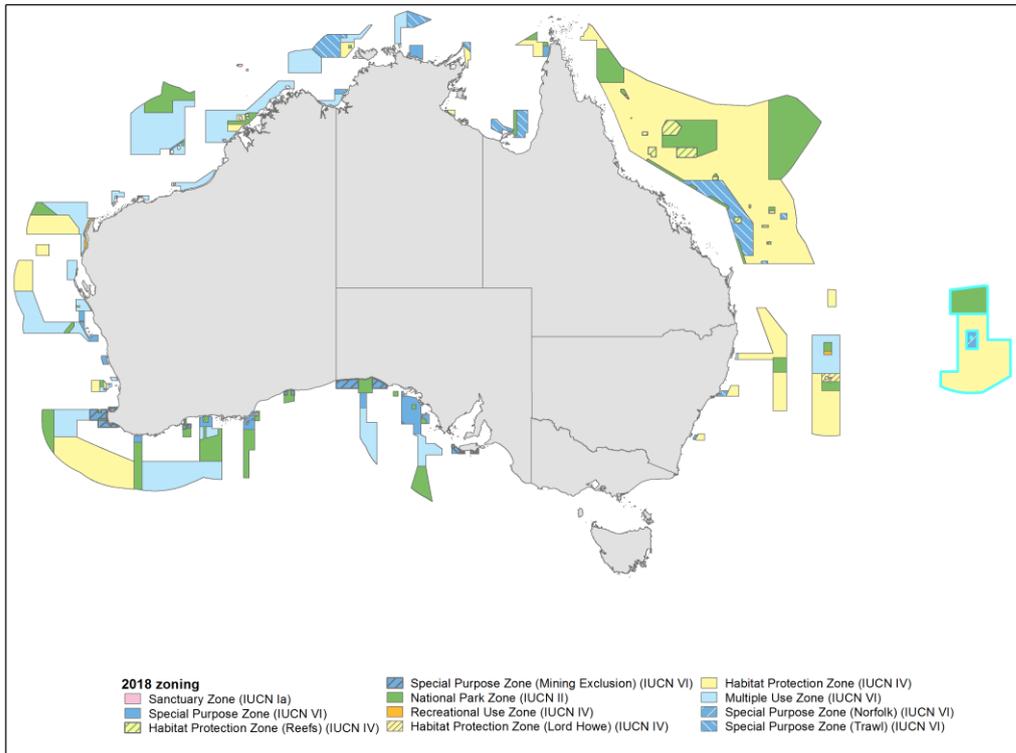
Economy and jobs

Based on economic modelling undertaken in 2012 (see for example ABARES 2012a, b, c), the estimated net economic impact of the 2018 zoning would be a reduction in regional economic activity of \$7.2 million in the short term and displacement of around 17 jobs in directly affected regions. Other regions would be likely to experience flow-on effects but changes in economic activity at the state and national levels are expected to be negligible in terms of the size of those economies.

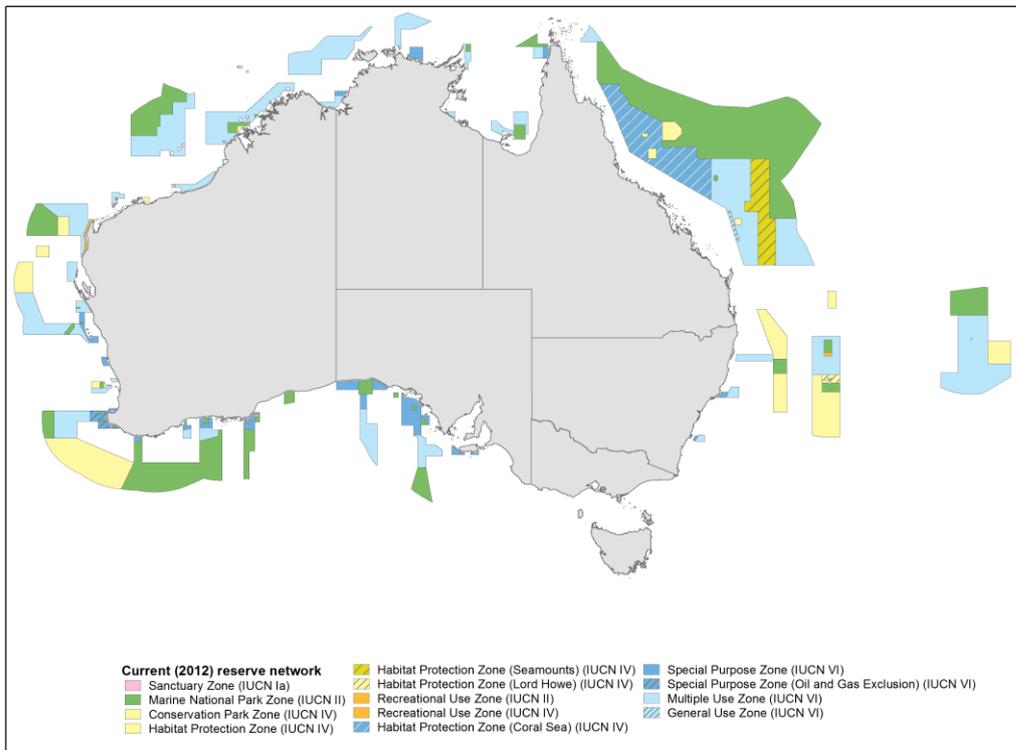
A separate estimate of potential job losses was extrapolated from a 2012 survey of impacted fishing businesses in the catching sector and processing sectors (independent of the economic modelling; see for example ABARES 2012a, c, d). Using this method, potential job losses from the commercial fisheries' catching and processing sectors was estimated at approximately 45 full-time jobs in the short term.

Reference maps

Map 1: National, the 2018 zoning for the marine park network

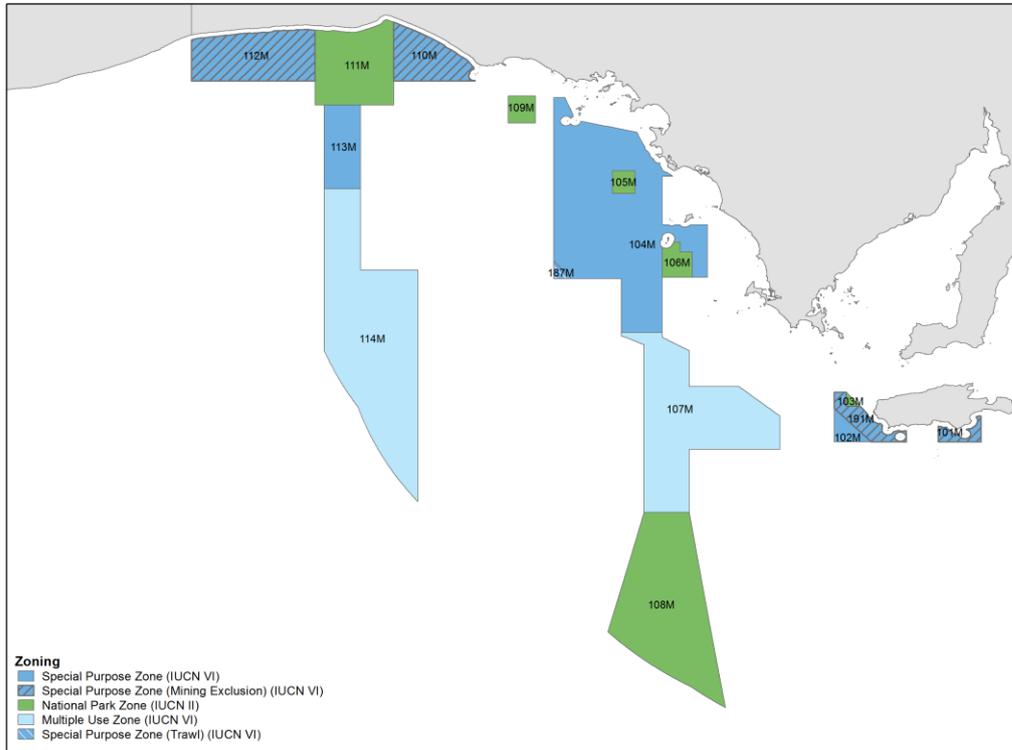


Map 2: National, the 2012 zoning for the marine park network

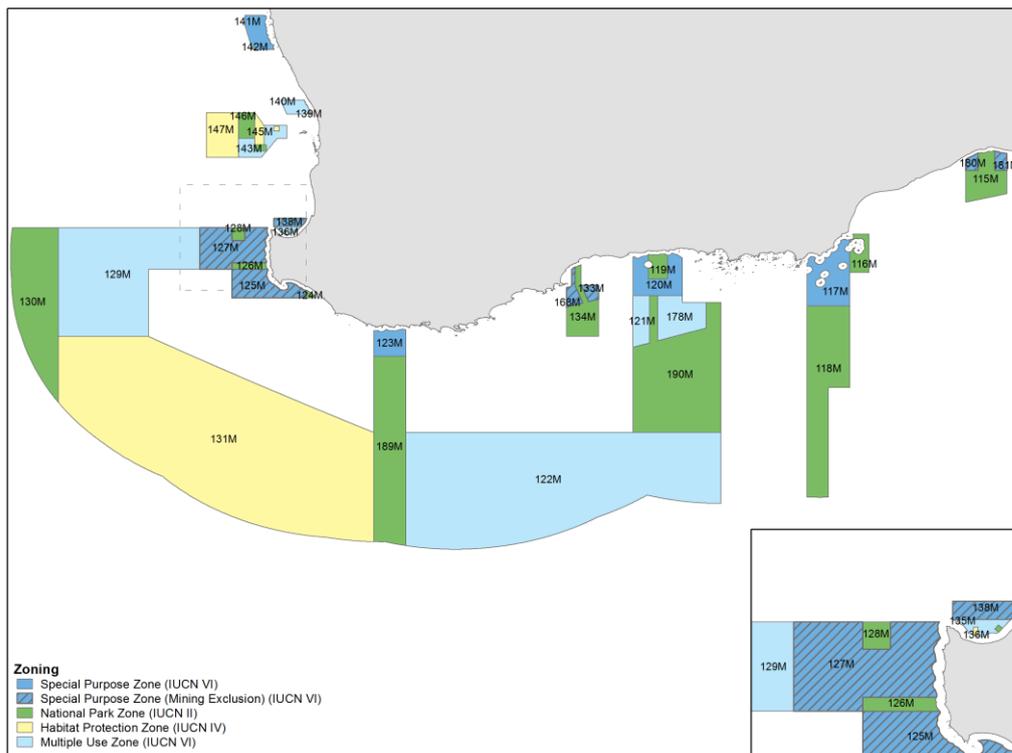


Commercial fishing displacement under the 2018 management plan zoning

Map 3: Detail of South Australian area of the 2018 zoning for the marine park network showing ABARES zone identifiers

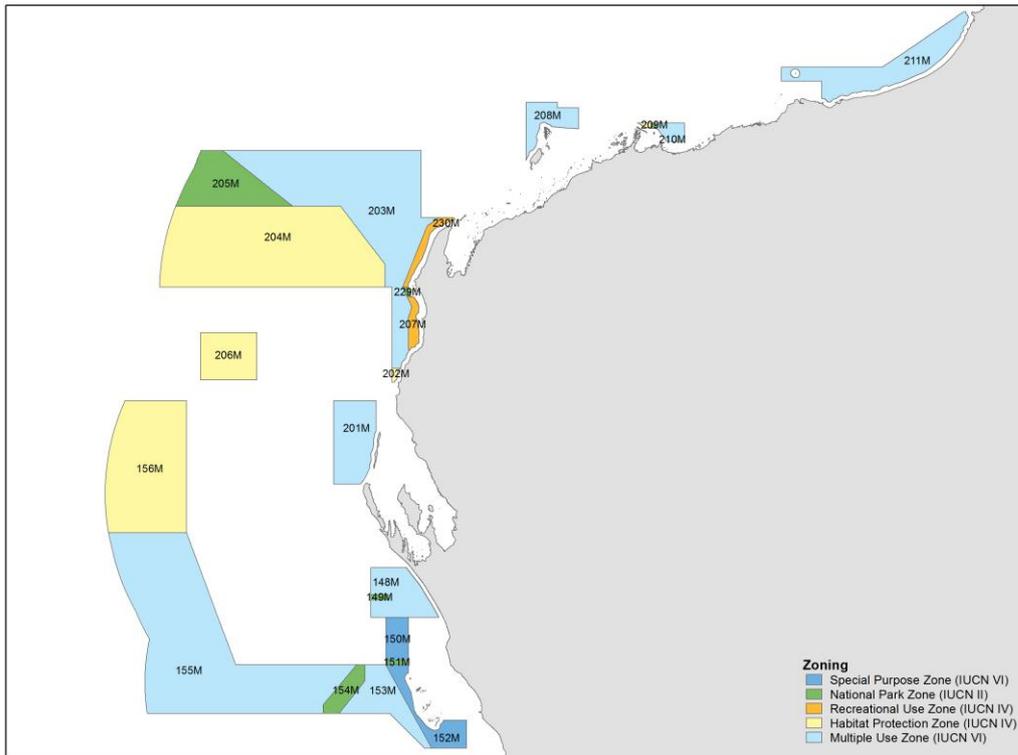


Map 4: Detail of southern Western Australian area of the 2018 zoning for the marine park network showing ABARES zone identifiers

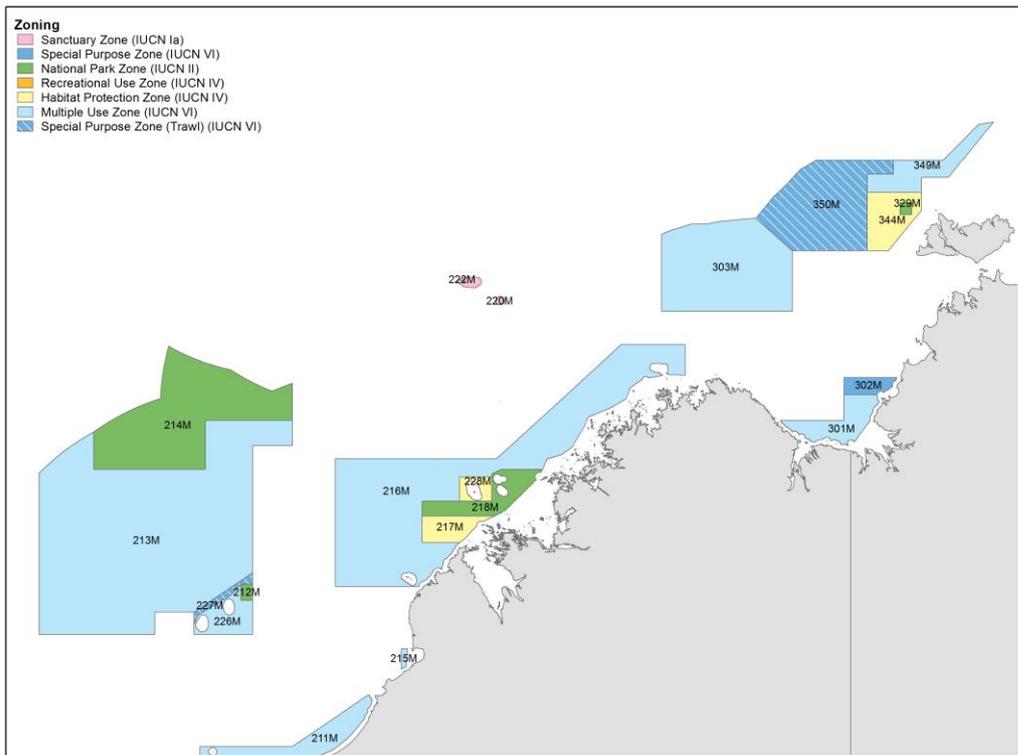


Commercial fishing displacement under the 2018 management plan zoning

Map 5: Detail of central Western Australian area of the 2018 zoning for the marine park network showing ABARES zone identifiers

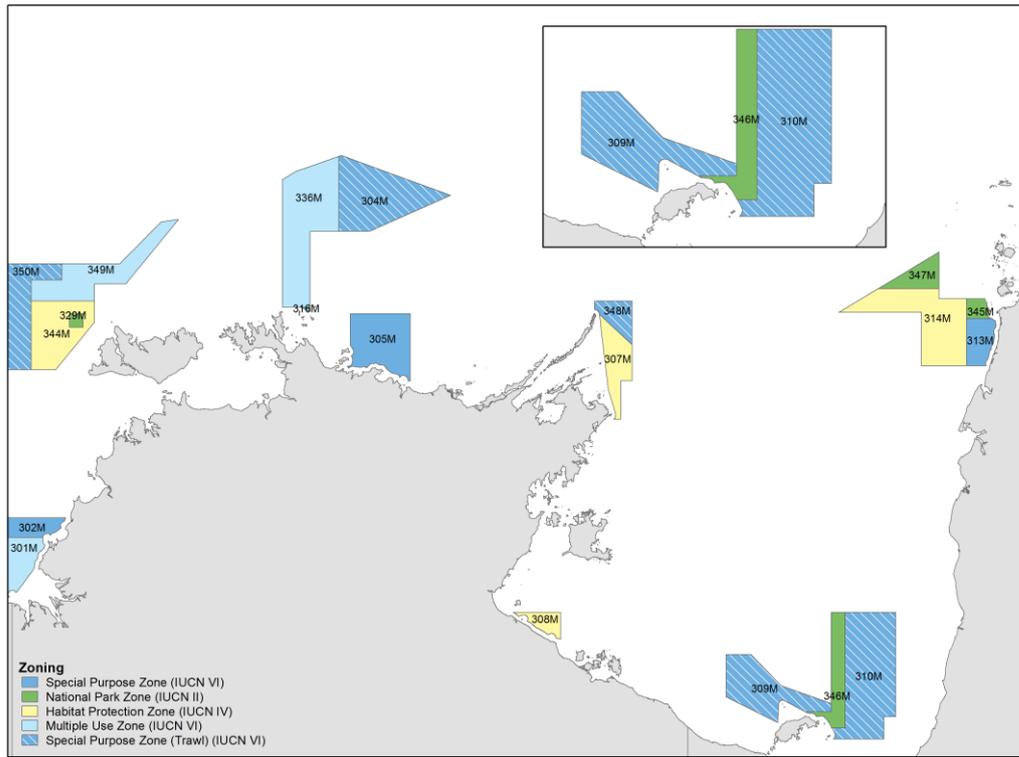


Map 6: Detail of north-west Western Australian area of the 2018 zoning for the marine park network showing ABARES zone identifiers

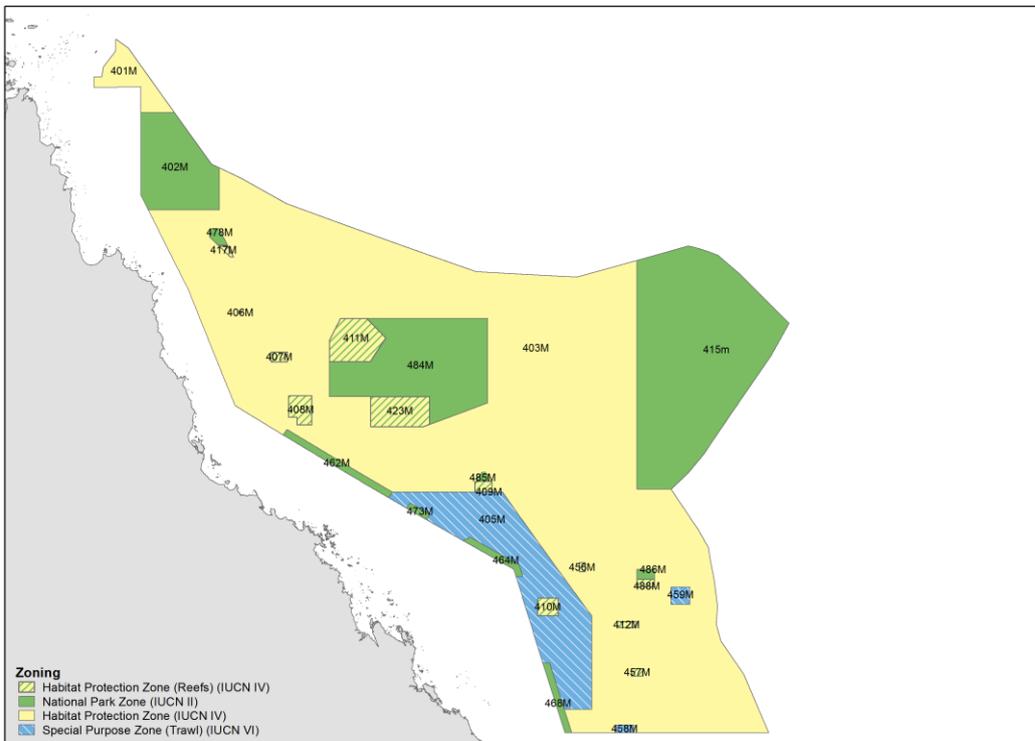


Commercial fishing displacement under the 2018 management plan zoning

Map 7: Detail of north Australian area of the 2018 zoning for the marine park network showing ABARES zone identifiers

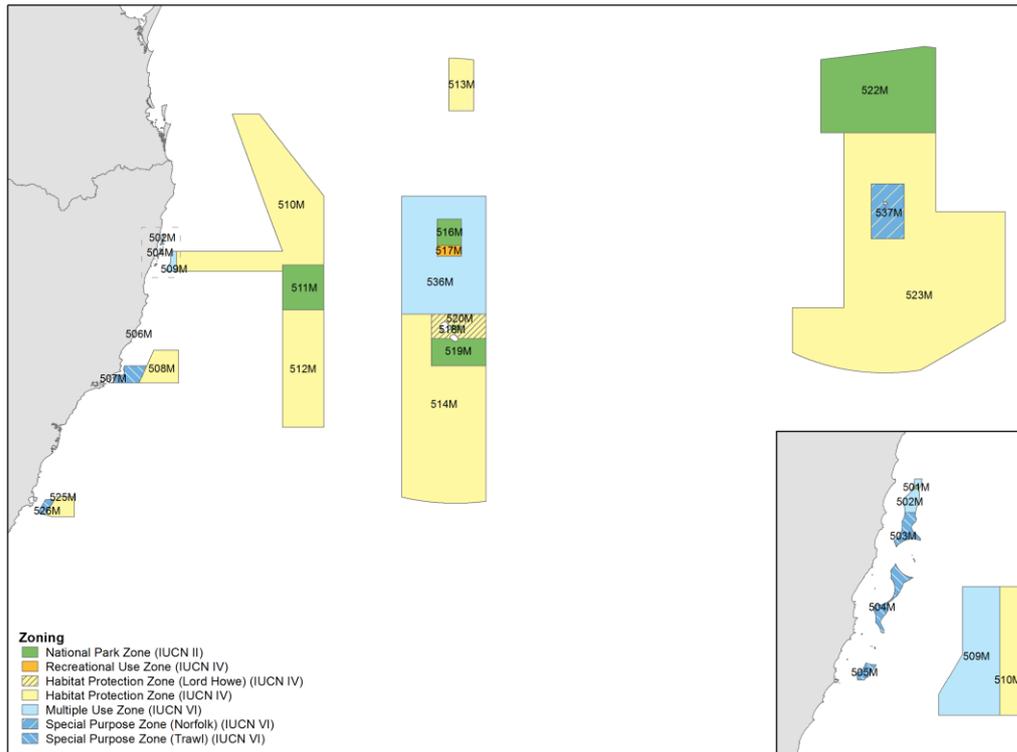


Map 8: Detail of Coral Sea area of the 2018 zoning for the marine park network showing ABARES zone identifiers



Commercial fishing displacement under the 2018 management plan zoning

Map 9: Detail of eastern Australian area of the 2018 zoning for the marine park network showing ABARES zone identifiers



References

ABARES (2012a) South-west Marine Region Commonwealth Marine Reserves Network: social and economic assessment of the impacts on commercial and charter fishing. Report on the draft marine reserves network, with a supplementary report for the final proposed marine reserves network. ABARES, Canberra <https://www.environment.gov.au/node/20827>

ABARES (2012b) Coral Sea Commonwealth Marine Reserve: social and economic assessment of the impacts on commercial and charter fishing Report on the draft marine reserve, with a supplementary report for the final proposed marine reserve. ABARES, Canberra <https://www.environment.gov.au/node/20821>

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ABARES (2012e) Temperate East Commonwealth Marine Reserves Network: social and economic assessment of the impacts on commercial fishing Report on the draft marine reserves network, with a supplementary report for the final proposed marine reserves network. ABARES, Canberra <https://www.environment.gov.au/node/20828>

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Buxton, C.D. & Cochrane, P (2015) Commonwealth Marine Reserves Review: Report of the Bioregional Advisory Panel. Department of the Environment, Canberra

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Fenton, D.M. & Marshall, N.A. (2001) A guide to the fishers of Queensland. Part A: TRC-Analysis and social profiles of Queensland's commercial fishing industry. CRC Reef Research Centre, Technical Report No. 36, Townsville

Appendix A

Estimation methods

Displacement calculation methodology used for fisheries.

Jurisdiction	Fishery	Spatial resolution of data	Processing method ¹
Commonwealth	Coral Sea Fishery	Shot-by-shot	1.1.b (Lines)
Commonwealth	Eastern Tuna and Billfish Fishery	Shot-by-shot	1.1.b (Lines)
Commonwealth	North West Slope Trawl Fishery	Shot-by-shot	1.1.b (Lines)
Commonwealth	Northern Prawn Fishery	Shot-by-shot	1.1.a (Points)
Commonwealth	SESSF Commonwealth Trawl Sector	Shot-by-shot	1.1.b (Lines)
Commonwealth	SESSF East Coast Deepwater Trawl	Shot-by-shot	1.1.b (Lines)
Commonwealth	SESSF Gillnet, Hook and Trap sector	Shot-by-shot	1.1.a (Points) and 1.1.b (Lines) as appropriate
Commonwealth	SESSF Great Australian Bight Trawl sector	Shot-by-shot	1.1.b (Lines)
Commonwealth	Small Pelagics Fishery	Shot-by-shot	1.1.a (Points) and 1.1.b (Lines) as appropriate
Commonwealth	Western Deepwater Trawl Fishery	Shot-by-shot	1.1.b (Lines)
Commonwealth	Western Tuna And Billfish Fishery	Shot-by-shot	1.1.b (Lines)
SA	Marine Scalefish Fishery	60 minute grid	1.2.a. Basic proportional area
SA	Northern Zone Rock Lobster	60 minute grid	1.2.e. Commonwealth/state split
WA	BECH = c050 FBL condition 50 Beche de mer	60 minute grid	1.2.b. Depth stratified (simple)
WA	DOFT = Developing Octopus Fishery	60 minute grid	1.2.b. Depth stratified (simple)
WA	ESP = Esperance Rock Lobster Managed Fishery	60 minute grid	1.2.b. Depth stratified (simple)
WA	FBL_CT = FBL - Crab Trap	60 minute grid	1.2.b. Depth stratified (simple)
WA	FBL_DL&HL = FBL - Dropline and Handline	60 minute grid	1.2.b. Depth stratified (simple)
WA	FBL_FT = FBL - Fish trap	60 minute grid	1.2.b. Depth stratified (simple)
WA	FBL_LINES = FBL - Lines (OA and FBL)	60 and 10 minute grid	60 min = 1.2.b. Depth stratified (simple) & 10 min = 1.2.a. Basic proportional area
WA	FBL_NETs = FBL - Gillnet ,Beach Seine and Haul Net	60 minute grid	1.2.b. Depth stratified (simple)
WA	FBL_OP = FBL - Octopus pot	60 minute grid	1.2.b. Depth stratified (simple)
WA	FBL_other = FBL - Other	60 minute grid	1.2.b. Depth stratified (simple)

1. Processing methods refer to those described in DSEWPac (2013) Fisheries Adjustment Assistance Package: Transitional Business Assistance Guidelines, Draft for Consultation June 2013.

Commercial fishing displacement under the 2018 management plan zoning

Jurisdiction	Fishery	Spatial resolution of data	Processing method ¹
WA	FBL_TN = FBL - Trap (G) Net	60 minute grid	1.2.b. Depth stratified (simple)
WA	GDS = Gascoyne Demersal Scalefish Managed Fishery	60 and 10 minute grid	60 min = 1.2.k. Imputing fishing patterns from fine scale data & 10 min = 1.2.a. Basic proportional area
WA	KPF = Kimberly Prawn Managed Fishery	60 and 10 minute grid	60 min = 1.2.k. Imputing fishing patterns from fine scale data & 10 min = 1.2.a. Basic proportional area
WA	MAC = Mackerel Managed Fishery	60 and 10 minute grid	60 min = 1.2.b. Depth stratified (simple) & 10 min = 1.2.a. Basic proportional area
WA	NBPR = Nickol Bay Prawn Fishery	60 and 10 minute grid	60 min = 1.2.k. Imputing fishing patterns from fine scale data & 10 min = 1.2.a. Basic proportional area
WA	NCS = c127 and L02 Joint Authority Northern Shark Fishery	60 minute grid	1.2.a. Basic proportional area
WA	NDSL = Northern Demersal Scalefish Fishery	60 and 10 minute grid	60 min = 1.2.k. Imputing fishing patterns from fine scale data & 10 min = 1.2.a. Basic proportional area
WA	PDC = Pilbara Developing Crab Fishery	60 minute grid	1.2.b. Depth stratified (simple)
WA	PLF = Pilbara Line Fishery (Condition)	60 minute grid	1.2.b. Depth stratified (simple)
WA	PTR = Pilbara Trap Managed Fishery	60 minute grid	1.2.b. Depth stratified (simple)
WA	SBPR = Shark Bay Prawn Fishery	60 and 10 minute grid	60 min = 1.2.b. Depth stratified (simple) & 10 min = 1.2.a. Basic proportional area
WA	SCPS = South Coast Purse-Seine Managed Fishery	60 minute grid	1.2.b. Depth stratified (simple)
WA	SCTF = Joint Authority Southern Demersal Gillnet and Deme	10 and 5 minute grid	10 min = 1.2.a. Basic proportional area & 5 min = 1.2.a. Basic proportional area
WA	SGL = Southern Rock Lobster Fishery (Condition)	60 minute grid	10 min = 1.2.a. Basic proportional area
WA	SRL = West Coast Deep Sea Crabs Fishery	60 minute grid	1.2.b. Depth stratified (simple)
WA	SWTF = West Coast Deep Sea Crustacean Fishery	60 minute grid	1.2.b. Depth stratified (simple)
WA	WCCL = West Coast Deep Sea Crustacean Licence	60 minute grid	1.2.b. Depth stratified (simple)
WA	WCDS = West Coast Demersal Scalefish (Interim) Managed F	60 and 10 minute grid	60 min = 1.2.b. Depth stratified (simple) & 10 min = 1.2.a. Basic proportional area
WA	WCGL = West Coast Demersal Gillnet and Demersal Longline	60 and 10 minute grid	60 min = 1.2.b. Depth stratified (simple) & 10 min = 1.2.a. Basic proportional area
WA	WCRL = West Coast Rock Lobster Managed Fishery	60 minute grid	60 min = 1.2.k. Imputing fishing patterns from fine scale data & 10 min = 1.2.a. Basic proportional area
WA	WHRL = Windy Harbour Rock Lobster Fishery	60 minute grid	1.2.b. Depth stratified (simple)

1. Processing methods refer to those described in DSEWPac (2013) Fisheries Adjustment Assistance Package: Transitional Business Assistance Guidelines, Draft for Consultation June 2013.

Commercial fishing displacement under the 2018 management plan zoning

Jurisdiction	Fishery	Spatial resolution of data	Processing method ¹
NT	A16 - TRAWLING	Shot-by-shot	1.1.a (Points)
NT	A18 - DROPLINE	Shot-by-shot	1.1.a (Points)
NT	A18 - LONGLINES	Shot-by-shot	1.1.a (Points)
NT	A18 - MOBILE FISH TRAP	Shot-by-shot	1.1.a (Points)
NT	A4 - TROLLING	Shot-by-shot	1.1.a (Points)
NT	A5 - DRIFTING GILLNET	Shot-by-shot	1.1.a (Points)
NT	A5 - LONGLINES	Shot-by-shot	1.1.a (Points)
NT	A6 - DROPLINE	Shot-by-shot	1.1.a (Points)
NT	A6 - MOBILE FISH TRAP	Shot-by-shot	1.1.a (Points)
NT	A6 - TRAWLING	Shot-by-shot	1.1.a (Points)
QLD	Aquarium Fish	30 and 6 minute grid	30 min = 1.2.a. Basic proportional area & 6 min = 1.2.a. Basic proportional area
QLD	Coral, Star Sand & Shell Grit	30 and 6 minute grid	30 min = 1.2.a. Basic proportional area & 6 min = 1.2.a. Basic proportional area
QLD	East Coast Beche-de-mer & Trochus	30 and 6 minute grid	30 min = 1.2.a. Basic proportional area & 6 min = 1.2.a. Basic proportional area
QLD	East Coast Inshore Fin Fish Fishery	30 and 6 minute grid	30 min = 1.2.a. Basic proportional area & 6 min = 1.2.a. Basic proportional area
QLD	East Coast Otter Trawl Fishery	30 and 6 minute grid	30 min = 1.2.a. Basic proportional area & 6 min = 1.2.a. Basic proportional area
QLD	Gulf of Carpentaria Developmental Fin Fish Trawl Fishery	30 and 6 minute grid	30 min = 1.2.a. Basic proportional area & 6 min = 1.2.a. Basic proportional area
QLD	Gulf of Carpentaria Inshore Fin Fish Fishery	30 and 6 minute grid	30 min = 1.2.f. Cropping to management boundaries 6 min = 1.2.f. Cropping to management boundaries
QLD	Gulf of Carpentaria Line Fishery	30 and 6 minute grid	30 min = 1.2.a. Basic proportional area & 6 min = 1.2.a. Basic proportional area
QLD	Gulf of Carpentaria Offshore Fin Fish Fishery	30 and 6 minute grid	30 min = 1.2.f. Cropping to management boundaries 6 min = 1.2.f. Cropping to management boundaries
QLD	Queensland Fisheries Joint Authority Line Fishery	30 and 6 minute grid	30 min = 1.2.a. Basic proportional area & 6 min = 1.2.a. Basic proportional area

1. Processing methods refer to those described in DSEWPac (2013) Fisheries Adjustment Assistance Package: Transitional Business Assistance Guidelines, Draft for Consultation June 2013.

Commercial fishing displacement under the 2018 management plan zoning

Jurisdiction	Fishery	Spatial resolution of data	Processing method ¹
NSW	Lobster	6 minute grid	6 min = 1.2.b. Depth stratified (simple)
NSW	Ocean Trap & Line	60 latitude and 6 minute grid	60 min = 1.2.k. Imputing fishing patterns from fine scale data & 6 min = 1.2.a. Basic proportional area
NSW	Ocean Trawl	60 latitude and 6 minute grid	60 min = 1.2.k. Imputing fishing patterns from fine scale data & 6 min = 1.2.a. Basic proportional area

1. Processing methods refer to those described in DSEWPaC (2013) Fisheries Adjustment Assistance Package: Transitional Business Assistance Guidelines, Draft for Consultation June 2013.

Gear/Zone tables

2018 zoning. Treatment of fishing gears in the different zoning types for the purposes of estimating displacement. Displacement is indicated by a '1'.

Commonwealth		Coral Sea				North				North-west						South-west						Temperate East								
Jurisdiction	Fishing Gear	Coral Sea Habitat Protection Zone	Coral Sea Habitat Protection Zone (Reefs)	Coral Sea National Park Zone	Coral Sea Special Purpose Zone (Trawl)	North Habitat Protection Zone	North Multiple Use Zone	North National Park Zone	North Special Purpose Zone	North Special Purpose Zone (Trawl)	North-west Habitat Protection Zone	North-west Multiple Use Zone	North-west National Park Zone	North-west Recreational Use Zone	North-west Sanctuary Zone	North-west Special Purpose Zone (Trawl)	South-west Habitat Protection Zone	South-west Multiple Use Zone	South-west National Park Zone	South-west Special Purpose Zone	South-west Special Purpose Zone (Mining Exclusion)	South-west Special Purpose Zone (Trawl)	Temperate East Habitat Protection Zone	Temperate East Habitat Protection Zone (Lord Howe)	Temperate East Multiple Use Zone	Temperate East Multiple Use Zone SI	Temperate East National Park Zone	Temperate East Recreational Use Zone	Temperate East Special Purpose Zone (Norfolk)	Temperate East Special Purpose Zone (Trawl)
Comm	Autolongline	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1				1	1	1		1	1	1	1
Comm	Bottom longline	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1				1	1	1		1	1	1	1
Comm	Dive			1				1					1	1	1				1					1			1	1		
Comm	DropLine			1				1					1	1	1				1								1	1		
Comm	Dropline Hydraulic			1				1					1	1	1				1								1	1		
Comm	Dropline Manual			1				1					1	1	1				1								1	1		
Comm	Fish Trap	1	1	1		1		1			1		1	1	1		1		1				1	1			1	1		
Comm	Gillnet	1	1	1	1	1	1	1			1	1	1	1	1	1	1	1	1				1	1	1	1	1	1	1	1
Comm	Handline		1	1				1					1	1	1				1								1	1		
Comm	Jig		1	1				1					1	1	1				1								1	1		
Comm	Minor Line		1	1				1					1	1	1				1								1	1		
Comm	Net (gillnet)	1	1	1	1	1	1	1			1	1	1	1	1	1	1	1	1				1	1	1	1	1	1	1	1
Comm	Pelagic Longline		1	1				1					1	1	1				1					1			1	1		
Comm	Poling		1	1				1					1	1	1				1								1	1		
Comm	Purse Seine		1	1				1					1	1	1				1					1			1	1		
Comm	Rod and Reel		1	1				1					1	1	1				1								1	1		
Comm	Trawl	1	1	1		1	1	1	1		1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	
Comm	Trawl (midwater)		1	1		1	1	1	1		1	1	1	1	1				1					1			1	1		
Comm	Troll		1	1				1					1	1	1				1								1	1		
Comm	Trotline	1	1	1		1		1			1	1	1	1	1	1	1	1	1				1	1	1		1	1	1	1

Commercial fishing displacement under the 2018 management plan zoning

South Australia		Coral Sea				North				North-west					South-west					Temperate East											
Jurisdiction	METHOD_NAME	Coral Sea Habitat Protection Zone	Coral Sea Habitat Protection Zone (Reefs)	Coral Sea National Park Zone	Coral Sea Special Purpose Zone (Trawl)	North Habitat Protection Zone	North Multiple Use Zone	North National Park Zone	North Special Purpose Zone	North Special Purpose Zone (Trawl)	North-west Habitat Protection Zone	North-west Multiple Use Zone	North-west National Park Zone	North-west Recreational Use Zone	North-west Sanctuary Zone	North-west Special Purpose Zone (Trawl)	South-west Habitat Protection Zone	South-west Multiple Use Zone	South-west National Park Zone	South-west Special Purpose Zone	South-west Special Purpose Zone (Mining Exclusion)	South-west Special Purpose Zone (Trawl)	Temperate East Habitat Protection Zone	Temperate East Habitat Protection Zone (Lord Howe)	Temperate East Multiple Use Zone	Temperate East Multiple Use Zone SI	Temperate East National Park Zone	Temperate East Recreational Use Zone	Temperate East Special Purpose Zone (Norfolk)	Temperate East Special Purpose Zone (Trawl)	
SA	Marine scalefish methods																1	1	1												
SA	Purse Seine																		1												
SA	Trap																1		1												

Commercial fishing displacement under the 2018 management plan zoning

Northern Territory		Coral Sea				North				North-west					South-west					Temperate East										
Jurisdiction	Fishing Gear	Coral Sea Habitat Protection Zone	Coral Sea Habitat Protection Zone (Reefs)	Coral Sea National Park Zone	Coral Sea Special Purpose Zone (Trawl)	North Habitat Protection Zone	North Multiple Use Zone	North National Park Zone	North Special Purpose Zone	North Special Purpose Zone (Trawl)	North-west Habitat Protection Zone	North-west Multiple Use Zone	North-west National Park Zone	North-west Recreational Use Zone	North-west Sanctuary Zone	North-west Special Purpose Zone (Trawl)	South-west Habitat Protection Zone	South-west Multiple Use Zone	South-west National Park Zone	South-west Special Purpose Zone	South-west Special Purpose Zone (Mining Exclusion)	South-west Special Purpose Zone (Trawl)	Temperate East Habitat Protection Zone	Temperate East Habitat Protection Zone (Lord Howe)	Temperate East Multiple Use Zone	Temperate East Multiple Use Zone SI	Temperate East National Park Zone	Temperate East Recreational Use Zone	Temperate East Special Purpose Zone (Norfolk)	Temperate East Special Purpose Zone (Trawl)
NT	DIVING HOOKAH							1																						
NT	DRIFTING GILLNET					1	1	1																						
NT	DROPLINE							1																						
NT	FINFISH LONGLINE					1	1	1	1	1																				
NT	HAND HARVEST/HOOKAH							1																						
NT	HAND HARVESTED							1																						
NT	LONGLINES					1	1	1	1	1																				
NT	MOBILE FISH TRAP					1		1																						
NT	TRAWLING					1	1	1	1																					
NT	TROLLING							1																						

Commercial fishing displacement under the 2018 management plan zoning

Queensland		Coral Sea				North				North-west					South-west					Temperate East										
Jurisdiction	Fishing Gear	Coral Sea Habitat Protection Zone	Coral Sea Habitat Protection Zone (Reefs)	Coral Sea National Park Zone	Coral Sea Special Purpose Zone (Trawl)	North Habitat Protection Zone	North Multiple Use Zone	North National Park Zone	North Special Purpose Zone	North Special Purpose Zone (Trawl)	North-west Habitat Protection Zone	North-west Multiple Use Zone	North-west National Park Zone	North-west Recreational Use Zone	North-west Sanctuary Zone	North-west Special Purpose Zone (Trawl)	South-west Habitat Protection Zone	South-west Multiple Use Zone	South-west National Park Zone	South-west Special Purpose Zone	South-west Special Purpose Zone (Mining Exclusion)	South-west Special Purpose Zone (Trawl)	Temperate East Habitat Protection Zone	Temperate East Habitat Protection Zone (Lord Howe)	Temperate East Multiple Use Zone	Temperate East Multiple Use Zone SI	Temperate East National Park Zone	Temperate East Recreational Use Zone	Temperate East Special Purpose Zone (Norfolk)	Temperate East Special Purpose Zone (Trawl)
QLD	Anchored gillnetting	1	1	1	1	1	1	1																						
QLD	Back Netting	1	1	1	1	1	1	1																						
QLD	Cast Netting			1				1																						
QLD	Collecting Coral			1				1																						
QLD	Collection			1				1																						
QLD	Diving			1				1																						
QLD	Drifting gillnetting	1	1	1	1	1	1	1																						
QLD	Dropline (Demersal longline)	1	1	1		1	1	1	1	1																				
QLD	Fish trapping	1	1	1		1		1																						
QLD	Fish trawling	1	1	1		1	1	1	1																					
QLD	Gillnetting	1	1	1	1	1	1	1																						
QLD	Handline		1	1				1																						
QLD	Haul Netting			1				1																						
QLD	Line		1	1				1																						
QLD	Line fishing		1	1				1																						
QLD	Ocean Beach Netting			1				1																						
QLD	Ocean Beach Netting Duplicate Operation			1				1																						
QLD	Ring Netting	1	1	1	1	1	1	1																						
QLD	Scoop/Dab Netting			1				1																						
QLD	Stripe Netting/Set Pocket Net	1	1	1	1	1	1	1																						
QLD	Trawling	1	1	1		1	1	1	1																					
QLD	Trolling		1	1				1																						
QLD	Tunnel Netting	1	1	1	1	1	1	1																						

Commercial fishing displacement under the 2018 management plan zoning

New South Wales		Coral Sea				North				North-west					South-west					Temperate East												
Jurisdiction	Fishing Gear	Coral Sea Habitat Protection Zone	Coral Sea Habitat Protection Zone (Reefs)	Coral Sea National Park Zone	Coral Sea Special Purpose Zone (Trawl)	North Habitat Protection Zone	North Multiple Use Zone	North National Park Zone	North Special Purpose Zone	North Special Purpose Zone (Trawl)	North-west Habitat Protection Zone	North-west Multiple Use Zone	North-west National Park Zone	North-west Recreational Use Zone	North-west Sanctuary Zone	North-west Special Purpose Zone (Trawl)	South-west Habitat Protection Zone	South-west Multiple Use Zone	South-west National Park Zone	South-west Special Purpose Zone	South-west Special Purpose Zone (Mining Exclusion)	South-west Special Purpose Zone (Trawl)	Temperate East Habitat Protection Zone	Temperate East Habitat Protection Zone (Lord Howe)	Temperate East Multiple Use Zone	Temperate East Multiple Use Zone SI	Temperate East National Park Zone	Temperate East Recreational Use Zone	Temperate East Special Purpose Zone (Norfolk)	Temperate East Special Purpose Zone (Trawl)		
NSW	Danish seine																						1	1	1	1	1	1	1			
NSW	Dropline																													1	1	
NSW	Hand collection																							1					1	1		
NSW	Hand net																							1					1	1		
NSW	Longline (demersal, auto-longline)																							1	1	1			1	1	1	1
NSW	Longline (pelagic)																								1				1	1		
NSW	Minor line																											1	1			
NSW	Net (demersal)																							1	1	1	1	1	1	1	1	1
NSW	Net (pelagic)																							1	1	1	1	1	1	1	1	1
NSW	Purse seine																								1				1	1		
NSW	Trap, pot																							1	1			1	1			
NSW	Trawl (demersal)																							1	1	1	1	1	1	1	1	
NSW	Trawl (midwater)																								1				1	1		
NSW	Trotline																							1	1	1		1	1	1	1	1

Commercial fishing displacement under the 2018 management plan zoning

2012 zoning. Treatment of fishing gears in the different zoning types for the purposes of estimating displacement. Displacement is indicated by a '1'.

Commonwealth		Coral Sea					North			North-west					South-west					Temperate East							
Jurisdiction	Fishing Gear	Conservation Park Zone	General Use Zone	Habitat Protection Zone (Coral Sea)	Habitat Protection Zone (Seamounts)	Marine National Park Zone	Multiple Use Zone	Marine National Park Zone	Multiple Use Zone	Special Purpose Zone	Habitat Protection Zone	Marine National Park Zone	Multiple Use Zone	Recreational Use Zone	Sanctuary Zone	Habitat Protection Zone	Marine National Park Zone	Multiple Use Zone	Special Purpose Zone	Special Purpose Zone (Oil and Gas Exclusion)	Habitat Protection Zone	Habitat Protection Zone (Lord Howe)	Marine National Park Zone	Multiple Use Zone	Recreational Use Zone	Special Purpose Zone	
Cwth	Trawl	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Cwth	Autolongline	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1	1	1	1	1	1
Cwth	Bottom longline	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1	1	1	1	1	1
Cwth	Dive					1		1						1	1								1	1	1	1	1
Cwth	Dropline	1				1		1				1		1	1			1						1	1	1	1
Cwth	Dropline hydraulic	1				1		1				1		1	1			1				1	1	1	1	1	1
Cwth	Dropline manual	1				1		1				1		1	1			1				1	1	1	1	1	1
Cwth	Fish trap	1				1	1	1				1		1	1	1	1	1					1	1	1	1	1
Cwth	Fish trap	1				1	1	1				1		1	1	1	1	1					1	1	1	1	1
Cwth	Gillnet	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1	1	1	1	1	1
Cwth	Handline	1				1		1				1		1	1			1						1	1	1	1
Cwth	Jig					1		1				1		1	1			1						1	1	1	1
Cwth	Pelagic longline	1		1		1		1				1		1	1			1					1	1	1	1	1
Cwth	Minor line	1				1		1				1		1	1			1						1	1	1	1
Cwth	Net (gillnet)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1	1	1	1	1	1
Cwth	Poling	1				1		1				1		1	1			1						1	1	1	1
Cwth	Purse seine	1		1	1	1		1				1		1	1			1					1	1	1	1	1
Cwth	Rod and reel	1				1		1				1		1	1			1						1	1	1	1
Cwth	Trawl	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Cwth	Trawl	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Cwth	Trotline	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1				1	1	1	1	1	1
Cwth	Troll	1				1		1				1		1	1			1					1	1	1	1	1
Cwth	Trawl	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Cwth	Trawl (midwater)	1	1	1	1	1	1	1	1	1		1		1	1			1	1				1	1	1	1	1

Commercial fishing displacement under the 2018 management plan zoning

Northern Territory		Coral Sea					North			North-west				South-west				Temperate East									
Jurisdiction	Fishing Gear	Conservation Park Zone	General Use Zone	Habitat Protection Zone (Coral Sea)	Habitat Protection Zone (Seamounts)	Marine National Park Zone	Multiple Use Zone	Marine National Park Zone	Multiple Use Zone	Special Purpose Zone	Habitat Protection Zone	Marine National Park Zone	Multiple Use Zone	Recreational Use Zone	Sanctuary Zone	Habitat Protection Zone	Marine National Park Zone	Multiple Use Zone	Special Purpose Zone	Special Purpose Zone (Oil and Gas Exclusion)	Habitat Protection Zone	Habitat Protection Zone (Lord Howe)	Marine National Park Zone	Multiple Use Zone	Recreational Use Zone	Special Purpose Zone	
NT	Diving hookah							1																			
NT	Drifting gillnet							1	1																		
NT	Dropline							1																			
NT	Finfish longline							1	1	1																	
NT	Hand harvest/hookah							1																			
NT	Hand harvested							1																			
NT	Longlines							1	1	1																	
NT	Mobile fish trap							1																			
NT	Trawling							1	1	1																	
NT	Trolling							1																			

South Australia		Coral Sea					North			North-west				South-west				Temperate East									
Jurisdiction	Fishing Gear	Conservation Park Zone	General Use Zone	Habitat Protection Zone (Coral Sea)	Habitat Protection Zone (Seamounts)	Marine National Park Zone	Multiple Use Zone	Marine National Park Zone	Multiple Use Zone	Special Purpose Zone	Habitat Protection Zone	Marine National Park Zone	Multiple Use Zone	Recreational Use Zone	Sanctuary Zone	Habitat Protection Zone	Marine National Park Zone	Multiple Use Zone	Special Purpose Zone	Special Purpose Zone (Oil and Gas Exclusion)	Habitat Protection Zone	Habitat Protection Zone (Lord Howe)	Marine National Park Zone	Multiple Use Zone	Recreational Use Zone	Special Purpose Zone	
SA	Marine scalefish methods															1	1	1									
SA	Purse seine																1										
SA	Trap															1	1										

Commercial fishing displacement under the 2018 management plan zoning

Western Australia		Coral Sea					North			North-west					South-west					Temperate East							
Jurisdiction	Fishing Gear	Conservation Park Zone	General Use Zone	Habitat Protection Zone (Coral Sea)	Habitat Protection Zone (Seamounts)	Marine National Park Zone	Multiple Use Zone	Marine National Park Zone	Multiple Use Zone	Special Purpose Zone	Habitat Protection Zone	Marine National Park Zone	Multiple Use Zone	Recreational Use Zone	Sanctuary Zone	Habitat Protection Zone	Marine National Park Zone	Multiple Use Zone	Special Purpose Zone	Special Purpose Zone (Oil and Gas Exclusion)	Habitat Protection Zone	Habitat Protection Zone (Lord Howe)	Marine National Park Zone	Multiple Use Zone	Recreational Use Zone	Special Purpose Zone	
WA	Beach seine and gillnet						1	1			1	1	1	1	1	1	1	1									
WA	Beach seine and haul net						1					1			1	1											
WA	Crab trap						1				1	1			1	1	1										
WA	Dropline						1					1			1	1		1									
WA	Dropline and handline						1					1			1	1		1									
WA	Diving						1					1			1	1		1									
WA	Fish trawling						1	1	1		1	1	1	1	1	1	1	1	1	1	1						
WA	Fish trap						1				1	1			1	1	1	1									
WA	Gillnet						1	1			1	1	1	1	1	1	1	1	1								
WA	Gillnet and haul net						1	1			1	1	1	1	1	1	1	1	1								
WA	Gillnet and longline						1	1	1		1	1	1	1	1	1	1	1	1								
WA	Handline						1					1			1	1		1									
WA	Handline and trolling						1					1			1	1		1									
WA	Lines and pot						1				1	1			1	1	1	1									
WA	Lines (OA and FBL)						1	1	1		1	1	1	1	1	1	1	1	1								
WA	Longline						1	1			1	1	1	1	1	1	1	1	1								
WA	Gillnet, beach seine and haul net						1	1			1	1	1	1	1	1	1	1	1								
WA	Octopus pot						1					1			1	1		1									
WA	Other (hand collection)						1					1			1	1		1									
WA	Other						1					1			1	1		1									
WA	Purse seine						1					1			1	1		1									
WA	Potting						1				1	1			1	1	1	1									
WA	Trap (G) net						1				1	1			1	1	1	1									
WA	Trawling						1	1	1		1	1	1	1	1	1	1	1	1	1	1						
WA	Wading						1					1			1	1		1									

Commercial fishing displacement under the 2018 management plan zoning

Queensland		Coral Sea					North			North-west					South-west					Temperate East							
Jurisdiction	Fishing Gear	Conservation Park Zone	General Use Zone	Habitat Protection Zone (Coral Sea)	Habitat Protection Zone (Seamounts)	Marine National Park Zone	Multiple Use Zone	Marine National Park Zone	Multiple Use Zone	Special Purpose Zone	Habitat Protection Zone	Marine National Park Zone	Multiple Use Zone	Recreational Use Zone	Sanctuary Zone	Habitat Protection Zone	Marine National Park Zone	Multiple Use Zone	Special Purpose Zone	Special Purpose Zone (Oil and Gas Exclusion)	Habitat Protection Zone	Habitat Protection Zone (Lord Howe)	Marine National Park Zone	Multiple Use Zone	Recreational Use Zone	Special Purpose Zone	
QLD	Anchored gillnetting	1	1	1	1	1	1	1	1																		
QLD	Back Netting					1		1																			
QLD	Cast Netting					1		1																			
QLD	Collecting Coral					1		1																			
QLD	Collection					1		1																			
QLD	Diving					1		1																			
QLD	Drifting gillnetting	1	1	1	1	1	1	1	1																		
QLD	Dropline (Demersal longline)	1	1	1	1	1	1	1	1	1																	
QLD	Fish trapping	1			1	1		1																			
QLD	Fish trawling	1		1	1	1	1	1	1	1																	
QLD	Gillnetting	1	1	1	1	1	1	1	1																		
QLD	Handline					1		1																			
QLD	Haul Netting					1		1																			
QLD	Line	1	1	1	1	1	1	1	1	1																	
QLD	Line fishing	1	1	1	1	1	1	1	1	1																	
QLD	Ocean Beach Netting					1		1																			
QLD	Ring Netting					1		1																			
QLD	Scoop/Dab Netting					1		1																			
QLD	Stripe Netting/Set Pocket Net					1		1																			
QLD	Trawling	1		1	1	1	1	1	1	1																	
QLD	Trolling					1		1																			
QLD	Tunnel Netting					1		1																			

Commercial fishing displacement under the 2018 management plan zoning

New South Wales		Coral Sea					North		North-west					South-west					Temperate East								
Jurisdiction	Fishing Gear	Conservation Park Zone	General Use Zone	Habitat Protection Zone (Coral Sea)	Habitat Protection Zone (Seamounts)	Marine National Park Zone	Multiple Use Zone	Marine National Park Zone	Multiple Use Zone	Special Purpose Zone	Habitat Protection Zone	Marine National Park Zone	Multiple Use Zone	Recreational Use Zone	Sanctuary Zone	Habitat Protection Zone	Marine National Park Zone	Multiple Use Zone	Special Purpose Zone	Special Purpose Zone (Oil and Gas Exclusion)	Habitat Protection Zone	Habitat Protection Zone (Lord Howe)	Marine National Park Zone	Multiple Use Zone	Recreational Use Zone	Special Purpose Zone	
NSW	Dropline																										
NSW	Danish seine trawl net (fish)																					1	1	1	1	1	1
NSW	Driftline																										
NSW	Fish trap (bottom/demersal)																										
NSW	Handline																										
NSW	Jigging																										
NSW	Lobster trapping																										
NSW	Otter trawl net (fish)																					1	1	1	1	1	1
NSW	Otter trawl net (prawns)																					1	1	1	1	1	1
NSW	Poling																										
NSW	Spanner crab net																										
NSW	Skindiving																										
NSW	Setline (demersal)																					1	1	1	1	1	1
NSW	Setline																					1	1	1	1	1	1
NSW	Trolling																										
NSW	Trotline (bottom set)																					1	1	1	1	1	1

Appendix B

Fishery level potential displacements

Fishery	Catch (tonnes)				GVP (\$'000)	
	2012 zoning		2018 zoning		2012 zoning	2018 zoning
	Total	Fishery %	Total	Fishery %	Total	Total
Commonwealth						
Coral Sea Fishery	29.4	62.7	30.7	65.4	150.3	154.4
Eastern Tuna and Billfish Fishery	441.3	8.0	89.5	1.6	3,012.4	480.9
High Seas Fisheries	*	*			*	
North West Slope Trawl Fishery	*	*	*	*	*	*
Northern Prawn Fishery	102.4	1.4	24.7	0.3	1,408.3	333.5
SESSF Commonwealth Trawl Sector	1.3	0.0	1.3	0.0	5.2	5.2
SESSF East Coast Deepwater Trawl	*	*	*	*	*	*
SESSF Gillnet, Hook and Trap sector	43.3	1.1	41.8	1.1	357.0	326.6
SESSF Great Australian Bight Trawl sector	4.0	0.1	4.0	0.1	23.0	23.0
Small Pelagics Fishery	*	*	*	*	*	*
Western Deepwater Trawl Fishery	0.8	2.5	0.8	2.5	6.2	6.2
Western Tuna And Billfish Fishery	5.2	1.4	5.8	1.5	51.8	57.5
South Australia						
Marine Scalefish Fishery	8.4	0.3%	8.4	0.3%	73.7	73.7
Northern Zone Rock Lobster	1.2	0.3%	1.2	0.3%	62.3	62.3
Western Australia						
c050 FBL condition 50 Beche de mer	*	*	*	*	*	*
Developing Octopus Fishery	0.1	0.1	0.1	0.3	0.5	1.1
Esperance Rock Lobster Managed Fishery	1.2	4.2	1.2	4.2	61.9	61.9
FBL - Crab Trap	1.4	6.2	0.2	1.1	36.4	6.9
FBL - Dropline and Handline	2.1	7.5	2.1	7.5	18.5	18.5
FBL - Fish trap	*	*	*	*	*	*
FBL - Lines (OA and FBL)	4.7	3.6	3.5	2.7	35.7	27.2
FBL - Gillnet ,Beach Seine and Haul Net	3.9	4.8	3.9	4.8	25.6	25.5
FBL - Octopus pot	0.2	0.5	0.2	0.6	1.3	1.5
FBL - Other	0.7	2.6	2.6	9.4	4.9	15.1
FBL - Trap (G) Net	1.5	1.0	*	*	1.9	*
Gascoyne Demersal Scalefish Managed Fishery	0.0	-	0.0	0.0	0.1	0.1
Kimberly Prawn Managed Fishery	1.1	0.5	1.1	0.5	11.6	11.6
Mackerel Managed Fishery	3.9	1.3	1.8	0.6	40.0	18.2
Nickol Bay Prawn Fishery	0.1	0.1	0.1	0.1	1.2	1.2
Joint Authority Northern Shark Fishery	38.5	33.9	34.8	30.6	91.7	83.5
Northern Demersal Scalefish Fishery	0.4	0.0	0.2	0.0	3.4	2.4
Pilbara Developing Crab Fishery	*	*	*	*	*	*
Pilbara Line Fishery (Condition)	1.0	0.9	1.0	0.9	7.5	7.5
Pilbara Trap Managed Fishery	2.1	0.5	0.6	0.2	18.2	5.2
Shark Bay Prawn Fishery	2.2	0.1	2.2	0.1	11.6	11.6
South Coast Purse-Seine Managed Fishery	0.7	0.0	0.0	0.0	0.8	0.0
South Coast Trawl Fishery	2.5	1.4	2.4	1.3	20.8	19.7
Joint Authority Southern Demersal Gillnet and Demersal Longline Managed Fishery	79.7	6.9	67.6	5.8	429.9	361.9
Southern Rock Lobster Fishery (Condition)	2.2	10.2	1.9	8.8	122.1	105.0
South West Trawl Fishery	9.6	13.2	9.6	13.2	81.1	81.1
West Coast Deep Sea Crustacean Fishery	0.4	0.3	0.6	0.4	9.7	13.0
West Coast Demersal Scalefish (Interim) Managed Fishery	14.2	3.4	14.1	3.4	133.5	132.8
West Coast Demersal Gillnet and Demersal Longline (Interim) Managed Fishery	8.8	4.9	8.7	4.9	37.0	37.0
West Coast Rock Lobster Managed Fishery	21.2	0.3	21.6	0.3	805.6	823.0
Windy Harbour Rock Lobster Fishery	0.2	2.0	0.2	2.0	6.0	6.0

Commercial fishing displacement under the 2018 management plan zoning

Fishery	Catch (tonnes)				GVP (\$'000)	
	2012 zoning		2018 zoning		2012 zoning	2018 zoning
	Total	Fishery %	Total	Fishery %	Total	Total
Northern Territory						
A16 - TRAWLING	*	*	*	*	*	*
A18 - DROPLINE						
A18 - LONGLINES	*	*	*	*	*	*
A18 - MOBILE FISH TRAP			0.2	<0.1		1.5
A4 - TROLLING			2.1	1.0		18.2
A5 - DRIFTING GILLNET	7.7	1%	7.3	1.0	27.0	26.5
A5 - LONGLINES	*	*	*	*	*	*
A6 - DROPLINE						
A6 - MOBILE FISH TRAP			*	*		*
A6 - TRAWLING	*	*	*	*	*	*
Queensland						
Aquarium Fish#	*	*	*	*	*	-
Coral, Star Sand & Shell Grit#	*	*	*	*	*	-
East Coast Beche-de-mer & Trochus#	*	*	*	*	*	-
East Coast Inshore Fin Fish Fishery	0.3	0.0	0.3	0.0	1.6	1.6
East Coast Otter Trawl Fishery	4.1	0.1	2.6	0.0	64.7	40.0
Gulf of Carpentaria Developmental Fin Fish Trawl Fishery	*	*	*	*	*	*
Gulf of Carpentaria Inshore Fin Fish Fishery	1.5	0.1	*	*	7.4	*
Gulf of Carpentaria Line Fishery	22.8	10.1	5.7	2.5	197.5	49.1
Gulf of Carpentaria Offshore Fin Fish Fishery	*	*	*	*	*	*
Queensland Fisheries Joint Authority Line Fishery	*	*	*	*	*	*
New South Wales						
Lobster	*	*	-	-	*	0.0
Ocean Trap & Line	1.6	0.1	5.8	0.3	5.3	27.8
Ocean Trawl	20.3	0.6	20.3	0.6	176.1	176.1

Note: * = confidential data; # = count of individuals