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Commercial fishing displacement under the Panel-recommended Commonwealth marine reserve zoning scheme

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Summary

The Government commissioned an independent review of the Commonwealth Marine Reserves that were originally proclaimed in November 2012. The review was undertaken by a Bioregional Advisory Panel ("the Panel") and examined five marine regions around Australia. The Panel considered a number of alternate marine reserve designs and zoning options during the course of the review and made its final recommendations to the government in December 2015 (Buxton and Cochrane 2015). To assist with the review process, the Department of the Environment commissioned the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) to assess the potential displacement of commercial fishing by alternative marine reserve designs and zoning options considered by the Panel.

This ABARES report provides an assessment of the Panel's final recommended internal zoning and permitted activities ('*the Panel-recommended network*') with comparisons made to the network proclaimed in November 2012 ('*the proclaimed network*'). The ABARES assessment includes potential displacement of commercial fisheries' catch and gross value of production (GVP), the magnitude of impacts to individual entitlement holders (fishers), 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 (e.g. ABARES 2012 a, c, d). ABARES were not commissioned to undertake new economic modelling or conduct additional surveys.

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 Australia[1]. 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 fishing operation. A range of methods were used to improve the accuracy of the displacement estimates however some clear caveats remain (see Methods).

Main findings

The potential impact of the Panel-recommended zoning on commercial fisheries in the regions is relatively small, compared with the total gross value of production (GVP) from all wild capture fisheries nationally (0.3 per cent). However, while much of the total impact is diffuse, some of the potential impact is concentrated in particular fisheries, entitlement holders and towns.

The following findings pertain to the Panel-recommended zoning. All estimates are expressed as average annual potential displacement, for the seven year reference period.

- The Panel-recommended zoning would potentially displace an estimated annual average 587.6 t of catch, with an annual average GVP of $4.51 million (Table 1). This is less than

[1] The South-east Commonwealth Marine Reserves 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.

the proclaimed network which would displace 1032 t of catch, with a GVP of $8.21 million (Table 1).

- For individual entitlements, there are a large number for which the potential impacts of the Panel-recommended zoning are relatively low. Over 700 entitlements would have less than $2500 displaced GVP per year (Figure 1). There are a smaller number of entitlements for which the potential impacts are higher; 25 entitlements with $25 000–$50 000 and 17 entitlements over $50 000 per year. These figures do not include South Australian entitlements because ABARES did not receive fisheries 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.
- At the fishery level, the largest displacement of catch (in tonnes) would be from the Commonwealth Eastern Tuna and Billfish Fishery (98.7 t), Northern Territory Offshore Net and Line (Longline method; 66.1 t) and the Western Australian/Commonwealth Joint Authority Southern Demersal Gillnet and Demersal Longline Fishery (67.6 t).
- In terms of GVP, the largest displacements would be in the Western Australian West Coast Rock Lobster Fishery ($823 000), Commonwealth Eastern Tuna and Billfish Fishery ($585 800) and Commonwealth Northern Prawn Fishery ($488 200).
- In terms of the proportion of GVP from the entire fishery, the largest displacements would be from the Commonwealth Coral Sea Fishery (71.2 per cent of fishery GVP), Western Australian North Coast Shark Fishery (33.9 per cent) and the Western Australian South West Trawl Fishery (13.2 per cent). In addition, there was a large proportion of the fishery GVP displaced from the Queensland Joint Authority (QFJA) Line Fishery however results for this fishery are confidential (less than five vessels).
- Towns with the highest potential GVP displacement were Mooloolaba in Queensland ($515 100), Geraldton in Western Australia ($449 200) and Fremantle in Western Australia ($406 300). There were 17 towns where the potential GVP displacement was greater than $50 000.
- The estimated net economic impact of the Panel-recommended network would be reduced regional economic activity of $7.9 million in the short term. Potential short term employment impacts were separately estimated at 18 total jobs (estimate derived from previous economic modelling) and 49 jobs (estimate derived 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.

Table 1: Estimated displacement by the proclaimed and Panel-recommended marine reserve networks

	CATCH (tonnes)			GVP ($,000)		
	Proclaimed (2012)	Panel Recommended (2015)	Percent of jurisdiction wild catch [1]	Proclaimed (2012)	Panel Recommended (2015)	Percent of jurisdiction wild GVP [1]
Total	1,032.4	587.6	0.4	8,201.4	4,511.9	0.4

[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).

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 fisheries[2]. 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 B: Displacement 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 reserves that would be displaced based on the permitted fishing activities within the different zoning types (*Appendix B: Gear/Zone tables*). Catch was converted to GVP using data on beach price.

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 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 reserve networks on towns and coastal communities.

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

Jurisdiction	Basis for GVP attribution to towns

[2] The South-east Commonwealth Marine Reserves 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.

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: *A guide to the fishers of Queensland* 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 were derived from an extrapolation of ABARES economic modelling undertaken on the proclaimed reserve network of 2012 (see for example ABARES 2012a, c, d). The 2012 economic modelling targeted specific regions where potential impacts were higher and then scaled these results to account for the total GVP potentially displaced under the proclaimed (2012) network. The results from the 2012 modelling have been rescaled for the displaced GVP under the panel-recommended (2015) network. The results presented here include estimates from the affected regions but do but 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, c, d).

Notes and caveats

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

- 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 (e.g. 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 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 the Commonwealth and New South Wales. For the other jurisdictions prices as published in DSEWPaC (2013) were used. These have been forecasted to the end of June 2015 values (that is, two years of inflation according to 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.

- GVP is not directly equivalent to the likely cost of any structural adjustment assistance that may occur.

- Some reserves zones in both the proclaimed and Panel-recommended networks 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 great caution.

- Potential displacement of aquarium fishing in the Coral Sea is reported for two zones 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. In addition, ABARES did not receive vessel level from South Australia so analyses of entitlements do not include South Australian fisheries.

Results

Displacement of fishing

Panel-recommended (2015) network

The Panel-recommended network would displace an estimated annual average of 587.6 t of catch with a GVP of $4.51 million (Table 4). The jurisdictions with the largest potentially displaced catch and GVP are the Commonwealth (228.8 t; $1.70 million) and Western Australia (186.9 t; $1.88 million). The marine regions with the largest potentially displaced catch and GVP (Table 5) are the South-west (174.7 t; $2.0 million) and the North (175.2 t; $1.0 million).

In terms of individual reserves, the largest potential GVP displacement by the Panel-recommended network comes from the Abrolhos ($879 300; South-west Marine Region), Coral Sea ($734 000), Gulf of Carpentaria ($360 000; North Marine Region) and Central Eastern ($358 700; Temperate East Marine Region) marine reserves (Table 6). Together these four marine reserves account for around half the total displacement of the Panel-recommended network.

Fishery level potential displacements are provided by jurisdiction and marine reserve scenario in *Appendix A*. The fisheries with the largest potential catch displacement by the Panel-recommended network are the Commonwealth Eastern Tuna and Billfish Fishery (98.7 t), Northern Territory Offshore Net and Line (Longline method; 66.1 t) and the Western Australian/Commonwealth Joint Authority Southern Demersal Gillnet and Demersal Longline Fishery (67.6 t).

The fisheries with the largest potential GVP displacement by the Panel-recommended network are the Western Australian West Coast Rock Lobster Fishery ($823 000), Commonwealth Eastern Tuna and Billfish Fishery ($585 800) and Commonwealth Northern Prawn Fishery ($488 200).

Proclaimed (2012) network

The proclaimed network would displace an estimated annual average of 1032.4 t 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; $3.1 million).

In terms of individual reserves, the largest potential GVP displacement by the proclaimed network comes from the Coral Sea ($3 143 800), Gulf of Carpentaria ($1 318 200; North), Abrolhos ($879 300; South-west) and Central Eastern ($352 700; Temperate East) marine reserves (Table 6). Together these four marine reserves account for 70 per cent of the potential displacement by the proclaimed network.

The fisheries with the largest catch and GVP displacements by the proclaimed network 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

The Panel-recommended network would displace less catch and GVP than the proclaimed network (Table 4). Displacements by the Panel-recommended network for Northern Territory

and New South Wales are both larger than under the proclaimed network, 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 proclaimed and the Panel-recommended network. This is because there were only minor changes recommended by the Panel adjacent to South Australia, none of which changed the estimated impact on South Australian fisheries.

The relative displacement between the regions has also changed between the proclaimed and Panel-recommended networks (Table 5). The Coral Sea proclaimed marine reserve accounted for 38 per cent of the total displacement, while it only accounts for 16 per cent of the Panel-recommended network. As a result of this, the South-west Marine Region in the Panel-recommended network accounts a larger proportion of the total potential displacement (changing from 26 to 45 per cent).

The Panel-recommended network would increase displaced catch relative to the proclaimed network in 8 marine reserves, decrease it in 14 and make no change in 22 (Table 6).

The same set of four marine reserves (Coral Sea, Gulf of Carpentaria, Abrolhos and Central Eastern; Table 6) account for the majority of potential GVP displacement under both network scenarios.

Table 4: Potential commercial fisheries' catch and GVP displacement by jurisdiction for the proclaimed (2012) reserve network and the Panel-recommended (2015) reserve network. The table also shows the Panel-recommended displacement as a percentage of the total wild production in the relevant jurisdictions.

	CATCH (tonnes)			GVP ($,000)		
	Proclaimed (2012)	Panel Recommended (2015)	Percent of jurisdiction wild catch [1]	Proclaimed (2012)	Panel Recommended (2015)	Percent of jurisdiction wild GVP [1]
Commonwealth	635.2	228.8	0.5	5,096.3	1,704.3	0.5
South Australia	9.5	9.5	<0.1	135.9	135.9	0.1
Western Australia	206.5	186.9	1.0	2,031.3	1,881.7	0.5
Northern Territory	82.8	84.5	1.6	192.0	208.3	0.7
Queensland	76.4	51.8	0.2	564.3	377.9	0.2
New South Wales	22.0	26.1	0.2	181.5	203.9	0.2
Total	1,032.4	587.6	0.4	8,201.4	4,511.9	0.4

[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 proclaimed (2012) reserve network and the Panel-recommended (2015) network.

	CATCH (tonnes)		GVP ($,000)	
Region	Proclaimed (2012)	Panel-recommended (2015)	Proclaimed (2012)	Panel-recommended (2015)
South-west	188.9	174.7	2,119.2	2,017.9
North-west	53.7	47.4	287.0	207.5
North	261.4	175.2	2,097.4	1,025.8
Coral Sea	457.3	119.7	3,143.8	734.0
Temperate East	71.1	70.6	554.1	526.8
Total	1,032.4	587.6	8,201.4	4,511.9

Table 6: Potential commercial fisheries' catch and GVP displacement by marine reserve for the proclaimed (2012) reserve network and the Panel-recommended (2015) reserve network.

	CATCH (tonnes)		GVP ($,000)	
Marine reserve	Proclaimed (2012)	Panel recommended (2015)	Proclaimed (2012)	Panel recommended (2015)
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	167.9
Murat	2.6	2.6	27.3	27.3
Great Australian Bight	11.9	11.9	64.7	64.7
Twilight	26.0	15.1	256.5	174.0
Eastern Recherche	19.8	19.4	134.1	132.0
South-west Corner	43.1	36.2	340.7	272.4
Bremer	10.9	14.0	62.9	90.9
Geographe	4.8	4.8	23.8	23.8
Two Rocks	10.2	10.8	95.2	113.5
Jurien	0.5	0.5	17.8	17.8
Perth Canyon	4.0	4.3	38.5	43.9
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	0.8	26.9	6.0
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	19.6
Roebuck	0.0	0.0	0.1	0.1
Kimberley	38.0	35.9	129.6	108.0
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	6.2	49.8	49.8
Oceanic Shoals	45.4	47.8	156.3	176.6
Arafura	15.6	15.6	112.8	112.5
Arnhem	16.5	16.5	32.4	32.0
Wessel	16.3	15.8	71.6	68.2
Limmen	4.9	4.9	18.1	18.1
Gulf of Carpentaria	106.6	37.7	1,318.2	360.0
West Cape York	49.9	30.9	338.3	208.7
Coral Sea	457.3	119.7	3,143.8	734.0
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	6.7	54.5	35.2
Jervis	1.3	1.5	4.3	4.8
Grand Total	**1,032.4**	**587.6**	**8,201.4**	**4,511.9**

Port flows

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

Panel-recommended (2015) network

The catch and GVP potentially displaced by the Panel-recommended network flowed to over 100 ports. Most ports (79) had less than $5000 of potentially displaced annual average GVP flowing to them (Figure 1) and of these, 42 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, Geraldton and Freemantle.

Proclaimed (2012) network

The catch potentially displaced by the proclaimed network flowed to over 100 ports. Most ports (70) had less than $5000 displaced annual average GVP flowing to them (Figure 2) 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, Freemantle and Mooloolaba.

Comparison

A similar total number of ports would be impacted by the two networks scenarios, with a similar pattern where the majority of ports have small flows of catch and a small number of ports receiving a large amount of catch.

The proclaimed network would displace a larger amount of catch and GVP which is reflected in the largest flows to ports. The largest flows from the proclaimed network would be $2.77 million to Cairns and $0.78 million to Fremantle (Table 8), compared with the largest flows under the Panel-recommended network of $0.55 million to Mooloolaba and $0.45 million to Geraldton (Table 7). The substantially reduced flow to Cairns under the Panel-recommended network is largely a result of reduced potential displacement from the Commonwealth Eastern Tuna and Billfish Fishery.

Figure 1: Histogram of annual average GVP ($'000) flows to ports for the Panel-recommended (2015) network

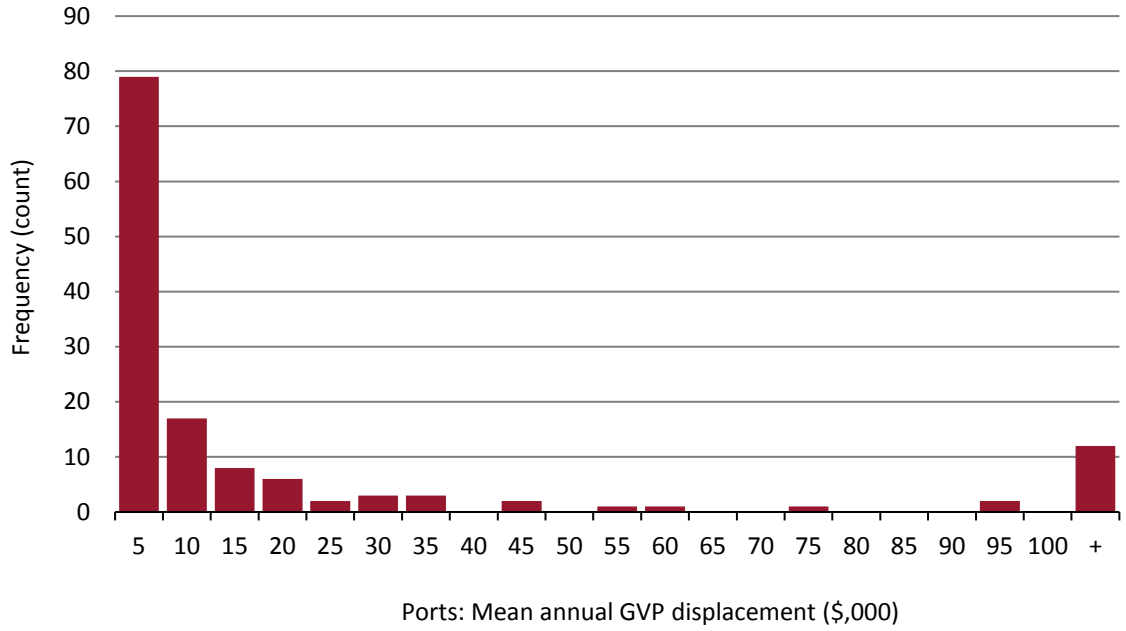


Table 7: Flows of potentially displaced catch and GVP to ports, Panel-recommended network (top 20 displacements by GVP)

Town (state)	Catch (t)	GVP ($'000)
Mooloolaba (QLD)	83.4	515.1
Geraldton (WA)	21.9	449.2
Fremantle (WA)	32.9	406.3
Esperance (WA)	47.7	345.7
Darwin (NT)	115.6	311.6
Cairns (QLD)	46.2	306.0
Kalbarri (WA)	10.3	296.0
Karumba (QLD)	40.9	286.0
Coffs Harbour (NSW)	14.8	138.4
Tuncurry (NSW)	20.0	123.4
Eucla (WA)	7.7	113.8
Brisbane (QLD)	9.2	93.2
Port Lincoln (SA)	11.1	90.5
Streaky Bay (SA)	10.9	71.2
Broome (WA)	14.7	56.7
Albany (WA)	10.3	50.9
Cowaramup (WA)	4.7	41.0
North Island (WA)	1.1	40.1
Weipa (QLD)	4.9	33.6
Abrolhos (WA)	0.9	32.8

Figure 2: Histogram of annual average GVP ($'000) flows to ports for the proclaimed (2012) network

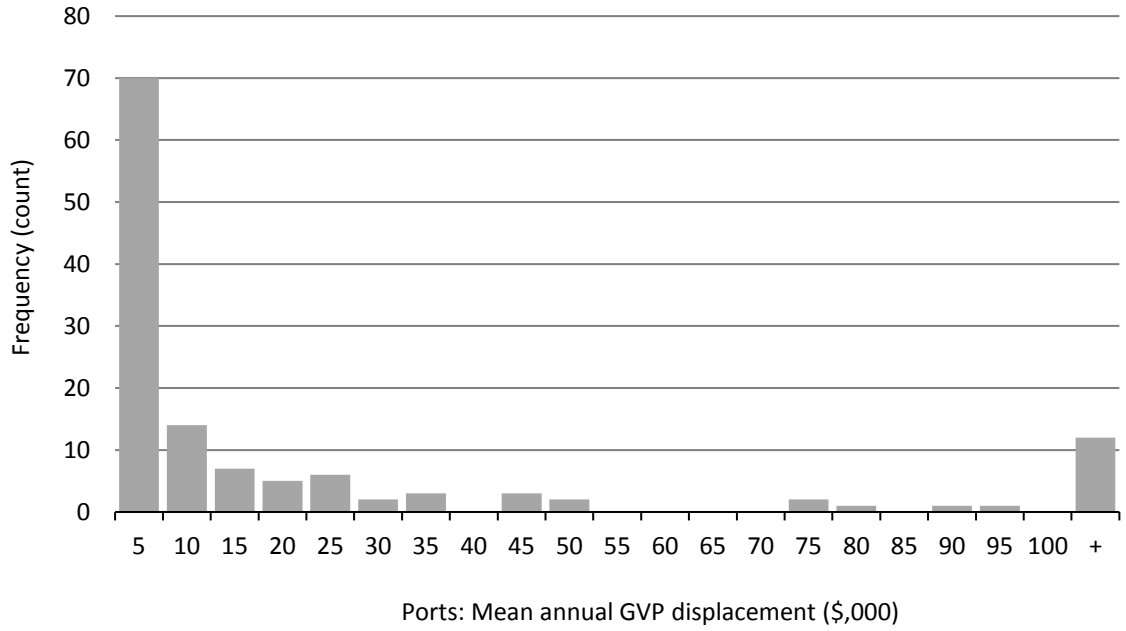


Table 8: Flows of potentially displaced catch and GVP to ports, proclaimed (2012) network (top 20 displacements by GVP)

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 at the level of fisheries entitlements was possible for all jurisdictions except South Australia so 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 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.

Panel-recommended (2015) network

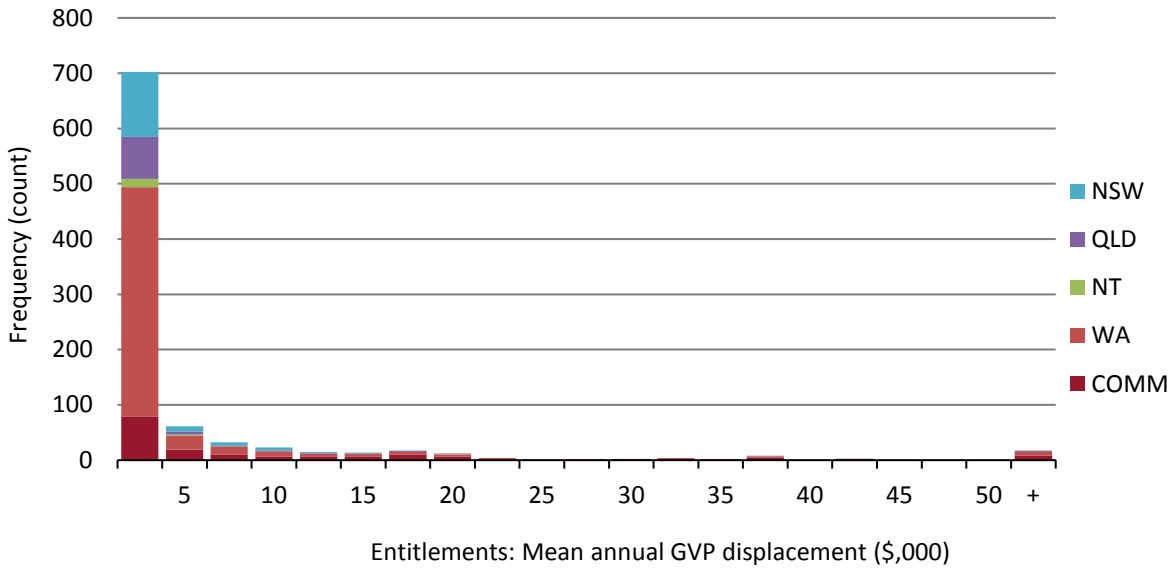
The catch of over 900 entitlements would be displaced by the Panel-recommended network. The majority of these (702) had less than $2500 potential annual average displacement (Figure 3) and of these, the majority (513) had less than $500.

There are however a small number of entitlements with relatively large potential GVP displacement; 25 with displacements of $25 000–$50 000 and 17 with displacement over $50 000. The largest displacement from one entitlement was $164 000.

Comparison

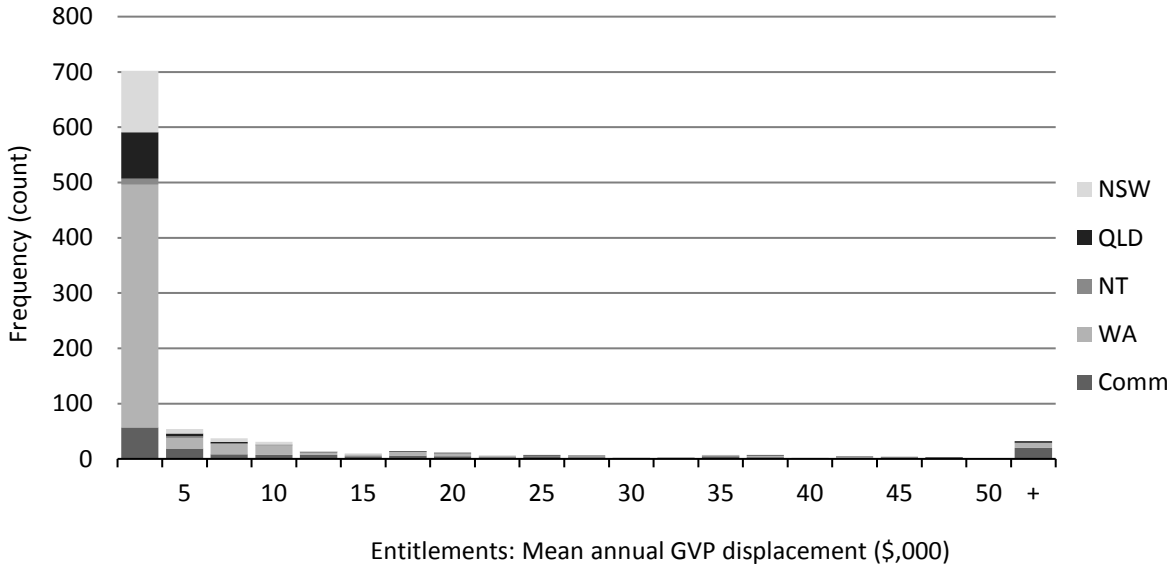
The overall pattern is consistent with that found for the proclaimed network (Figure 4) whereby the majority of entitlements (702) had less than $2500 potential annual average displacement, with 535 of these having less than $500 displacement. In the case of the proclaimed network however there were a greater number of entitlements with relatively large potential GVP displacement: 39 entitlements with $25 000–$50 000 and 32 with over $50 000 displacement. Under the proclaimed network there were three Commonwealth fisheries entitlements with potential displacements in excess of $450 000.

Figure 3: Stacked histogram of potential GVP displacement by entitlement: Panel-recommended (2015) 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 4: Stacked histogram of potential GVP displacement by entitlement: Proclaimed (2012) network



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

The estimated net economic impact of the Panel-recommended network would be reduced regional economic activity of $7.9 million in the short term and displacement of around 18 jobs in directly affected regions. Other regions would be likely to experience flow-on effects but

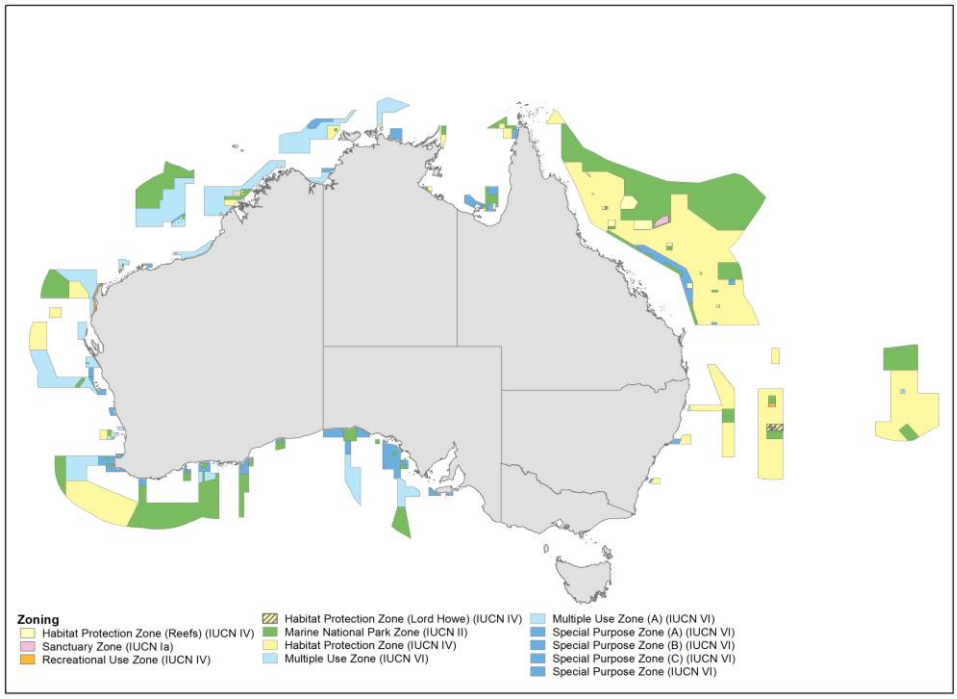
changes in economic activity at the state level are expected to be negligible in terms of the size of those economies.

These estimates were derived from an extrapolation of ABARES economic modelling undertaken in 2012 (see for example ABARES 2012a, c, d). They include estimates from the affected regions but do but include estimates from total state and national economies because these were previously assessed as negligible relative to the size of those economies. Total regional economic effect, therefore, represents the sum of the effects on regional and Northern Territory economies and employment.

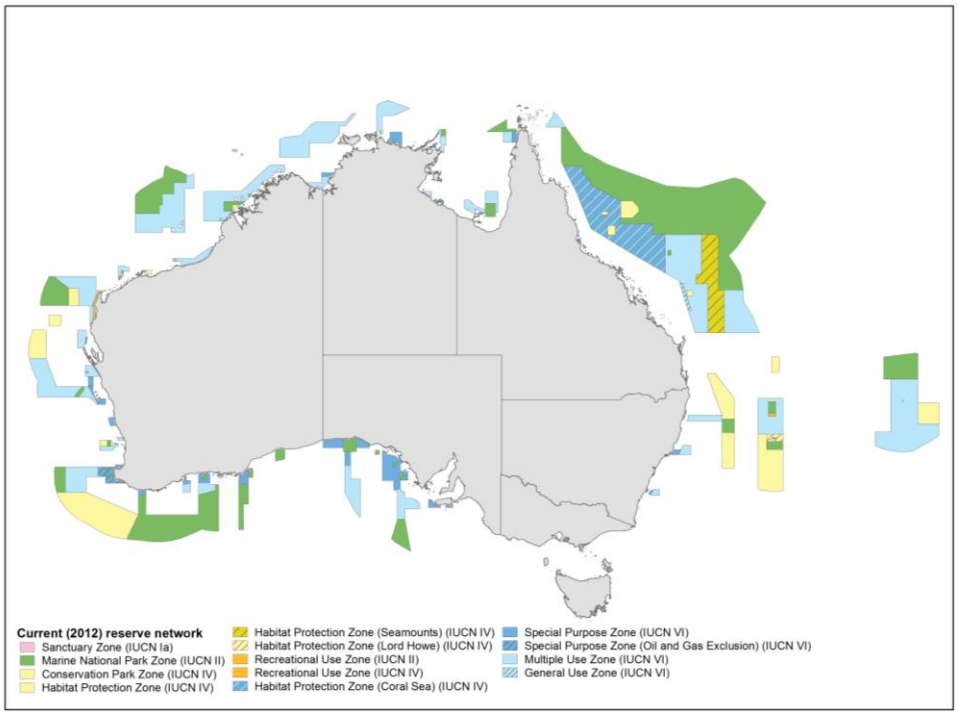
Independent of the economic modelling, potential job losses from the commercial fisheries' catching and processing sectors were estimated at approximately 49 full-time jobs in the short term, based on an extrapolation of responses to 2012 surveys of fishing businesses (see for example ABARES 2012a, c, d).

Reference Maps

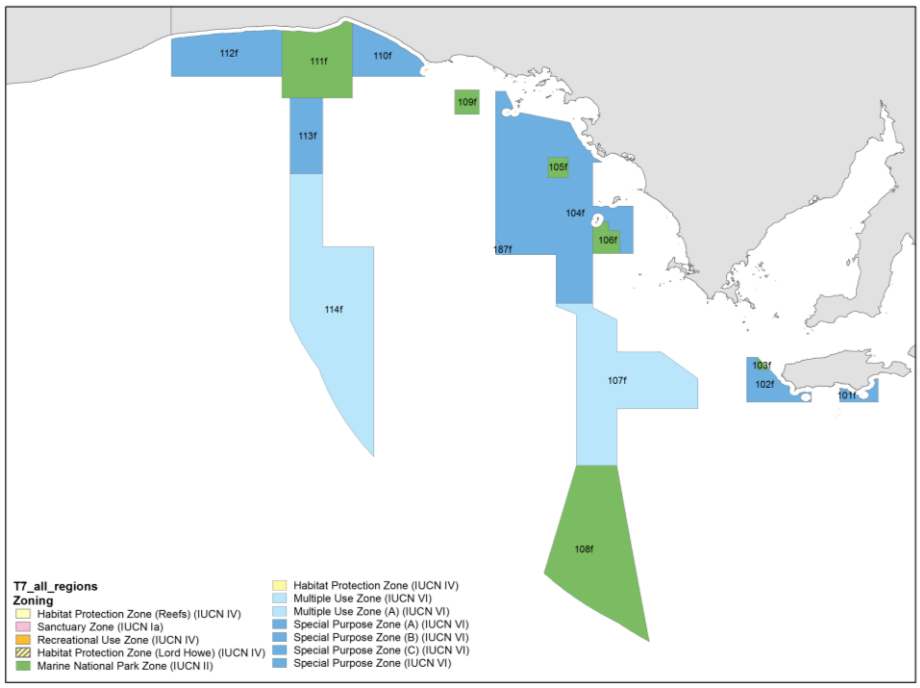
Map 1: National, Panel-recommended (2015) marine reserve network



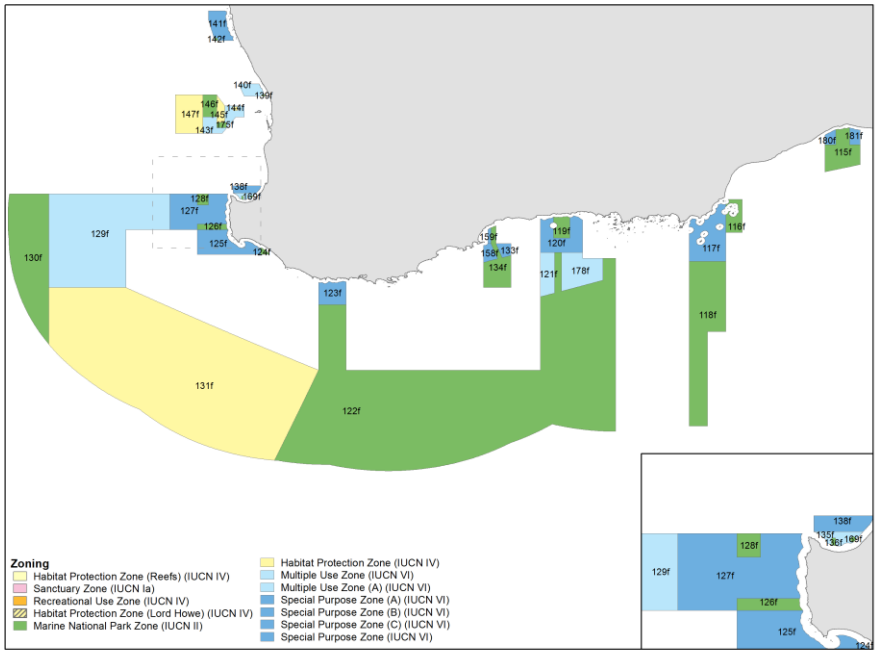
Map 2: National, proclaimed (2012) marine reserve network



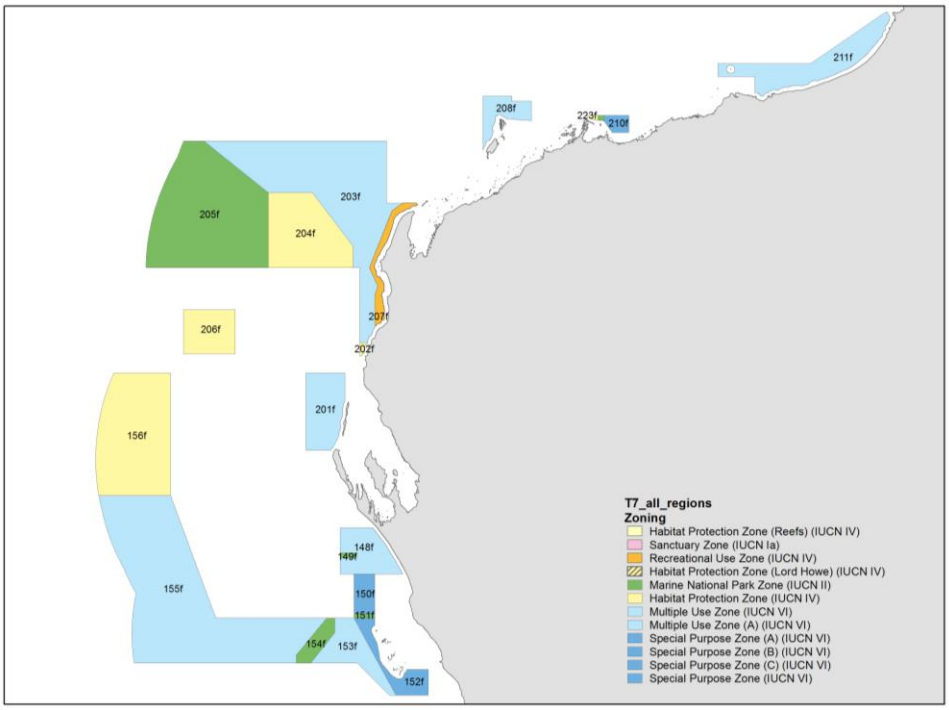
Map 3: Detail of South Australian area of Panel-recommended marine reserve network showing ABARES zone identifiers



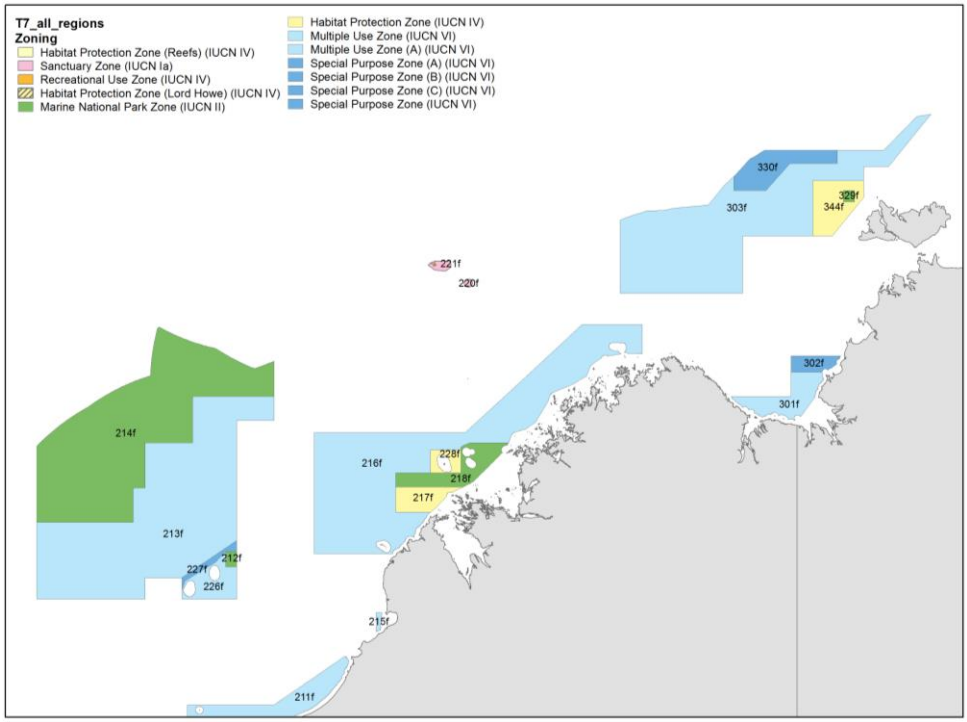
Map 4: Detail of Southern Western Australian area of Panel-recommended marine reserve network showing ABARES zone identifiers



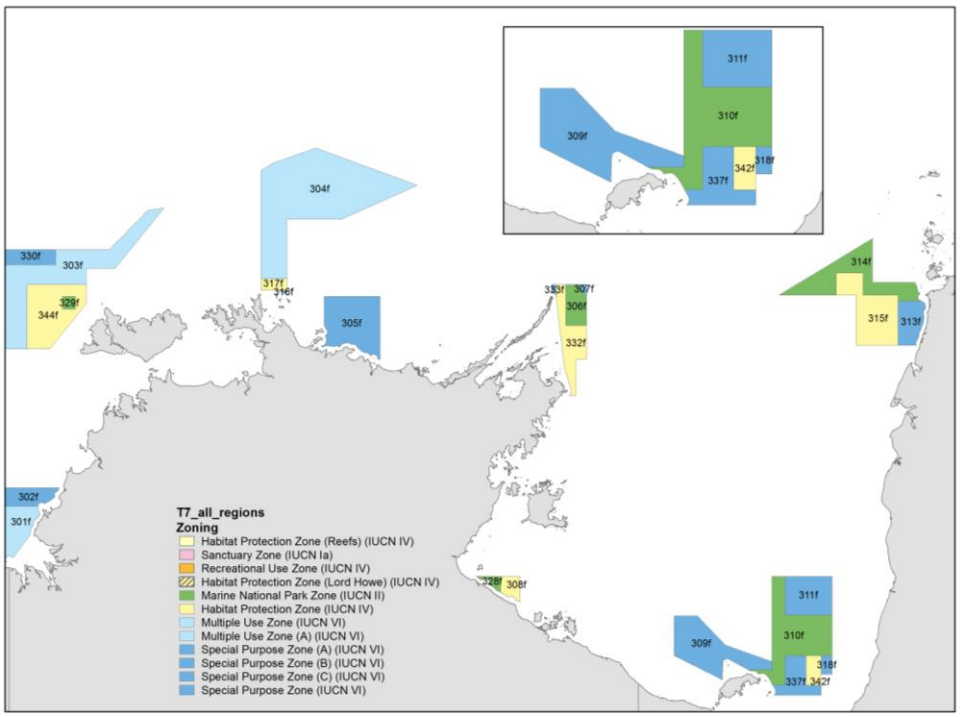
Map 5: Detail of Central Western Australian area of Panel-recommended marine reserve network showing ABARES zone identifiers



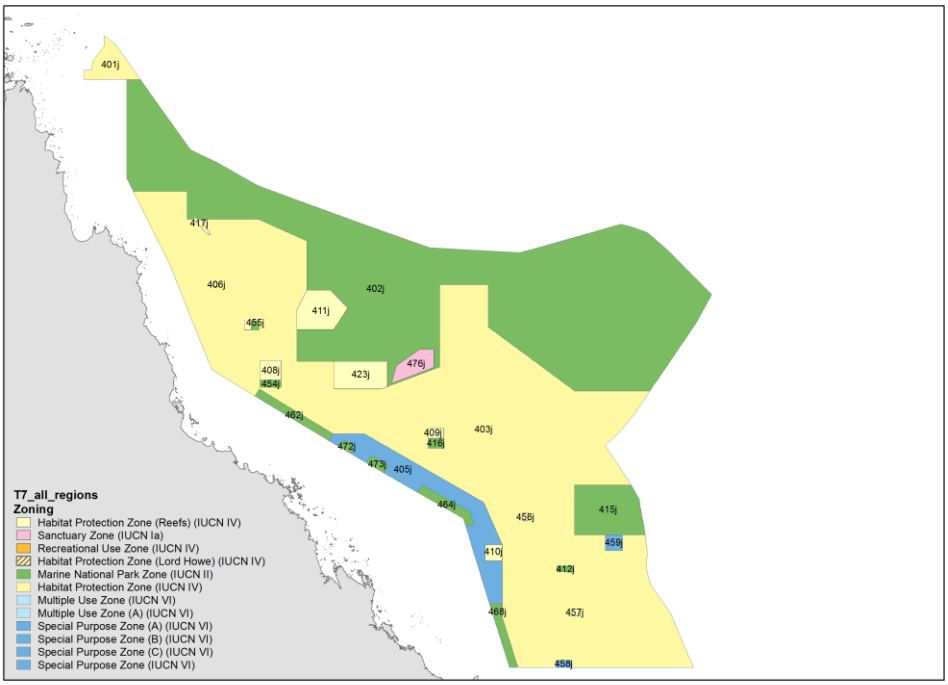
Map 6: Detail of North-west Western Australian area of Panel-recommended marine reserve network showing ABARES zone identifiers



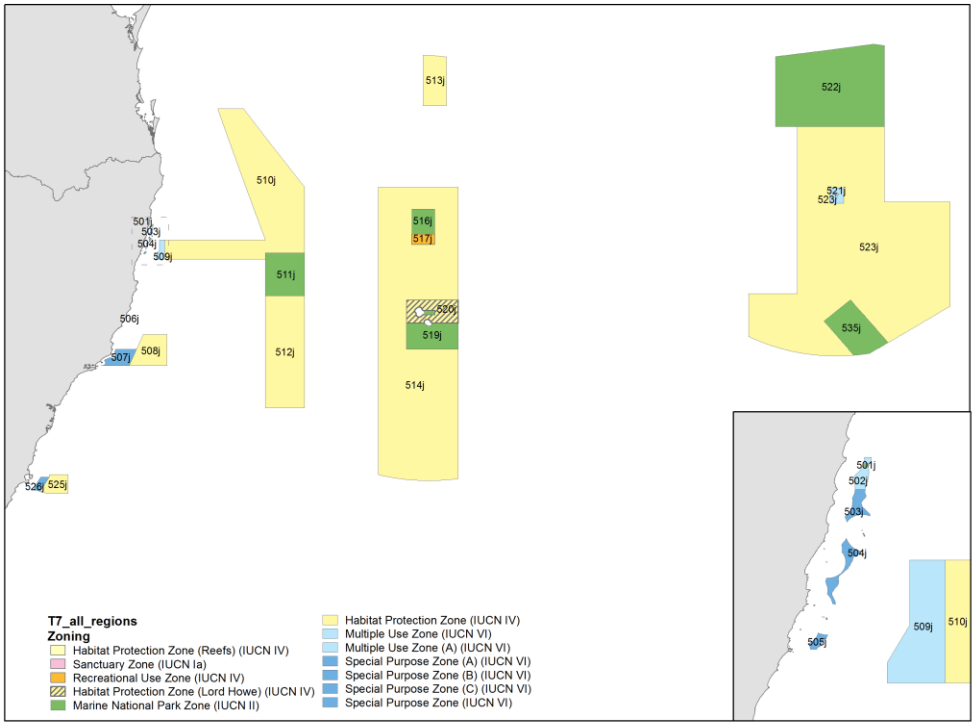
Map 7: Detail of North Australian area of Panel-recommended marine reserve network showing ABARES zone identifiers



Map 8: Detail of Coral Sea area of Panel-recommended marine reserve network showing ABARES zone identifiers



Map 9: Detail of Eastern Australian area of Panel-recommended marine reserve network showing ABARES zone identifiers



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Appendix A

Potential commercial fisheries' catch and GVP displacement by fishery for the proclaimed (2012) reserve network and the Panel-recommended (2015) reserve network. Grey cells are totals that do not include some confidential data.

	Catch (tonnes)				GVP ($'000)	
	Proclaimed (2012)		Panel recommended (2015)		Proclaimed (2012)	Panel recommended (2015)
Reserve	**Total**	**Fishery %**	**Total**	**Fishery %**	**Total**	**Total**
Commonwealth						
Coral Sea Fishery	29.4	62.7	33.4	71.2	150.3	174.4
Eastern Tuna and Billfish Fishery	441.3	8.0	98.7	1.8	3,012.4	585.8
High Seas Fisheries	*	*			*	
North West Slope Trawl Fishery	*	*	*	*	*	*
Northern Prawn Fishery	102.4	1.4	37.9	0.5	1,408.3	488.2
SESSF Commonwealth Trawl Sector	1.3	0.0	1.3	-	5.2	5.2
SESSF East Coast Deepwater Trawl	*	*	*	*	*	*
SESSF Gillnet, Hook and Trap sector	43.3	1.1	41.3	1.1	357.0	323.4
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	0.3	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	0.7	2.6	4.9	4.8
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
c127 and L02 Joint Authority Northern Shark Fishery	38.5	33.9	38.5	33.9	91.7	91.7
Northern Demersal Scalefish Fishery	0.4	0.0	0.3	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	0.7	0.2	18.2	5.4
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	1.9	1.1	20.8	16.1
Joint Authority Southern Demersal Gillnet and Demersal Longline Managed Fishery (Zone 1 & Zone 2)(SRL1 & SRL2)	79.7	6.9	67.6	5.8	429.9	361.8
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	12.8
West Coast Demersal Scalefish (Interim) Managed Fishery	14.2	3.4	14.1	3.4	133.5	132.9
West Coast Demersal Gillnet and Demersal Longline (Interim) Managed Fishery	8.8	4.9	8.8	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

Northern Territory						
A16 - TRAWLING	*	*	*	*	*	*
A18 - DROPLINE			*	*		*
A18 - LONGLINES	*	*	*	*	*	*
A18 - MOBILE FISH TRAP			0.2	0%		1.5
A4 - TROLLING			2.1	1%		18.2
A5 - DRIFTING GILLNET	7.7	1%	7.7	1%	27.0	26.7
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	0.5	0.0	1.6	2.0
East Coast Otter Trawl Fishery	4.1	0.1	3.2	0.1	64.7	48.5
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	13.7	6.1	197.5	118.7
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

Appendix B

Displacement estimation methods

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

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)

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)

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

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

Gear/Zone tables

Proclaimed network. 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	Special Purpose Zone (Ports)	Special Purpose Zone (Trawl)	Habitat Protection Zone	Marine National Park Zone	Multiple Use Zone	Special Purpose Zone	Special Purpose Zone (Oil and Gas Exclusion)	Special Purpose Zone (Scallop Trawl)	Habitat Protection Zone	Habitat Protection Zone (Lord Howe)	Marine National Park Zone	Multiple Use Zone	Recreational Use Zone	Special Purpose Zone
Cwth	Trawl	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0
Cwth	Autolongline	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	0
Cwth	Bottom longline	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	0
Cwth	Dive	0	0	0	0	1	0	1	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	1	1	0	1	0
Cwth	Dropline	1	0	0	0	1	0	1	0	0	1	1	0	1	1	0	0	0	1	0	0	0	0	0	0	1	0	1	0
Cwth	Dropline hydraulic	1	0	0	0	1	0	1	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	1	1	1	0	1	0
Cwth	Dropline manual	1	0	0	0	1	0	1	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	1	1	1	0	1	0
Cwth	Fish trap	1	0	0	1	1	0	1	0	0	0	1	0	1	1	0	0	1	1	0	0	0	0	0	1	1	0	1	0
Cwth	Fish trap	1	0	0	1	1	0	1	0	0	0	1	0	1	1	0	0	1	1	0	0	0	0	0	1	1	0	1	0
Cwth	Gillnet	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1
Cwth	Handline	1	0	0	0	1	0	1	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0	1	0	1	0
Cwth	Jig	0	0	0	0	1	0	1	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0	1	0	1	0
Cwth	Pelagic longline	1	0	1	0	1	0	1	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	1	1	0	1	0
Cwth	Minor line	1	0	0	0	1	0	1	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0	1	0	1	0
Cwth	Net (gillnet)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1
Cwth	Poling	1	0	0	0	1	0	1	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0	1	0	1	0
Cwth	Purse seine	1	0	1	1	1	0	1	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	1	1	0	1	0
Cwth	Rod and reel	1	0	0	0	1	0	1	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0	1	0	1	0
Cwth	Trawl	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0
Cwth	Trawl	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0
Cwth	Trotline	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	0	0	1	1	1	1	1	0
Cwth	Troll	1	0	0	0	1	0	1	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	1	1	0	1	0
Cwth	Trawl	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0
Cwth	Trawl (midwater)	1	1	1	1	1	1	1	1	1	0	1	0	1	1	0	0	0	1	1	0	0	0	0	1	1	0	1	0

Western Australia		North			North-west							South-west					
Jurisdiction	Fishing Gear	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	Special Purpose Zone (Ports)	Special Purpose Zone (Trawl)	Habitat Protection Zone	Marine National Park Zone	Multiple Use Zone	Special Purpose Zone	Special Purpose Zone (Oil and Gas Exclusion)	Special Purpose Zone (Scallop Trawl)
WA	Beach seine and gillnet		1	0	1	1	1	1	1			1	1	1	0	0	
WA	Beach seine and haul net		0	0	0	1	0	1	1			0	1	0	0	0	
WA	Crab trap		0	0	1	1	0	1	1			1	1	0	0	0	
WA	Dropline		0	0	0	1	0	1	1			0	1	0	0	0	
WA	Dropline and handline		0	0	0	1	0	1	1			0	1	0	0	0	
WA	Diving		0	0	0	1	0	1	1			0	1	0	0	0	
WA	Fish trawling		1	1	1	1	1	1	1			1	1	1	1	1	
WA	Fish trap		0	0	1	1	0	1	1			1	1	0	0	0	
WA	Gillnet		1	0	1	1	1	1	1			1	1	1	0	0	
WA	Gillnet and haul net		1	0	1	1	1	1	1			1	1	1	0	0	
WA	Gillnet and longline		1	1	1	1	1	1	1			1	1	1	0	0	
WA	Handline		0	0	0	1	0	1	1			0	1	0	0	0	
WA	Handline and trolling		0	0	0	1	0	1	1			0	1	0	0	0	
WA	Lines and pot		0	0	1	1	0	1	1			1	1	0	0	0	
WA	Lines (OA and FBL)		1	1	1	1	1	1	1			1	1	1	0	0	
WA	Longline		1	0	1	1	1	1	1			1	1	1	0	0	
WA	Gillnet, beach seine and haul net		1	0	1	1	1	1	1			1	1	1	0	0	
WA	Octopus pot		0	0	0	1	0	1	1			0	1	0	0	0	
WA	Other (hand collection)		0	0	0	1	0	1	1			0	1	0	0	0	
WA	Other		0	0	0	1	0	1	1			0	1	0	0	0	
WA	Purse seine		0	0	0	1	0	1	1			0	1	0	0	0	
WA	Potting		0	0	1	1	0	1	1			1	1	0	0	0	
WA	Trap (G) net		0	0	1	1	0	1	1			1	1	0	0	0	
WA	Trawling		1	1	1	1	1	1	1			1	1	1	1	1	
WA	Wading		0	0	0	1	0	1	1			0	1	0	0	0	

South Australia		South-west					
Jurisdiction	Fishing Gear	Habitat Protection Zone	Marine National Park Zone	Multiple Use Zone	Special Purpose Zone	Special Purpose Zone (Oil and Gas Exclusion)	Special Purpose Zone (Scallop Trawl)
SA	Marine scalefish methods	1	1	1	0	0	
SA	Purse seine	0	1	0	0	0	
SA	Trap	1	1	0	0	0	

Northern Territory		North		
Jurisdiction	Fishing Gear	Marine National Park Zone	Multiple Use Zone	Special Purpose Zone
NT	Diving hookah	1	0	0
NT	Drifting gillnet	1	1	0
NT	Dropline	1	0	0
NT	Finfish longline	1	1	1
NT	Hand harvest/hookah	1	0	0
NT	Hand harvested	1	0	0
NT	Longlines	1	1	1
NT	Mobile fish trap	1	0	0
NT	Trawling	1	1	1
NT	Trolling	1	0	0

Queensland		Coral Sea						North		
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
QLD	Anchored gillnetting	1	1	1	1	1	1	1	1	0
QLD	Back Netting	0	0	0	0	1	0	1	0	0
QLD	Cast Netting	0	0	0	0	1	0	1	0	0
QLD	Collecting Coral	0	0	0	0	1	0	1	0	0
QLD	Collection	0	0	0	0	1	0	1	0	0
QLD	Diving	0	0	0	0	1	0	1	0	0
QLD	Drifting gillnetting	1	1	1	1	1	1	1	1	0
QLD	Dropline (Demersal longline)	1	1	1	1	1	1	1	1	1
QLD	Fish trapping	1	0	0	1	1	0	1	0	0
QLD	Fish trawling	1	0	1	1	1	1	1	1	1
QLD	Gillnetting	1	1	1	1	1	1	1	1	0
QLD	Handline	0	0	0	0	1	0	1	0	0
QLD	Haul Netting	0	0	0	0	1	0	1	0	0
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	0	0	0	0	1	0	1	0	0
QLD	Ring Netting	0	0	0	0	1	0	1	0	0
QLD	Scoop/Dab Netting	0	0	0	0	1	0	1	0	0
QLD	Stripe Netting/Set Pocket Net	0	0	0	0	1	0	1	0	0
QLD	Trawling	1	0	1	1	1	1	1	1	1
QLD	Trolling	0	0	0	0	1	0	1	0	0
QLD	Tunnel Netting	0	0	0	0	1	0	1	0	0

New South Wales		Temperate East					
Jurisdiction	Fishing Gear	Habitat Protection Zone	Habitat Protection Zone (Lord Howe)	Marine National Park Zone	Multiple Use Zone	Recreational Use Zone	Special Purpose Zone
NSW	Dropline	0	0	1	0	1	0
NSW	Danish seine trawl net (fish)	1	1	1	1	1	1
NSW	Driftline	0	0	1	0	1	0
NSW	Fish trap (bottom/demersal)	0	1	1	0	1	0
NSW	Handline	0	0	1	0	1	0
NSW	Jigging	0	0	1	0	1	0
NSW	Lobster trapping	0	0	1	0	1	0
NSW	Otter trawl net (fish)	1	1	1	1	1	0
NSW	Otter trawl net (prawns)	1	1	1	1	1	0
NSW	Poling	0	0	1	0	1	0
NSW	Spanner crab net	0	0	1	0	1	0
NSW	Skindiving	0	0	1	0	1	0
NSW	Setline (demersal)	1	1	1	1	1	0
NSW	Setline	1	1	1	1	1	0
NSW	Trolling	0	0	1	0	1	0
NSW	Trotline (bottom set)	1	1	1	1	1	0

Panel recommended network. 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	Habitat Protection Zone	Habitat Protection Zone (Reefs)	Marine National Park Zone	Sanctuary Zone	Special Purpose Zone (A)	Special Purpose Zone (B)	Habitat Protection Zone	Marine National Park Zone	Multiple Use Zone	Special Purpose Zone	Special Purpose Zone (A)	Special Purpose Zone (B)	Habitat Protection Zone	Marine National Park Zone	Multiple Use Zone	Recreational Use Zone	Sanctuary Zone	Special Purpose Zone	Special Purpose Zone (A)	Habitat Protection Zone	Marine National Park Zone	Multiple Use Zone	Multiple Use Zone (A)	Special Purpose Zone	Special Purpose Zone (A)	Special Purpose Zone (B)	Special Purpose Zone (C)	Habitat Protection Zone	Habitat Protection Zone (Lord Howe)	Marine National Park Zone	Multiple Use Zone	Multiple Use Zone (A)	Recreational Use Zone	Special Purpose Zone
Cwth	Trawl	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0
Cwth	Autolongline	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1
Cwth	Bottom longline	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1
Cwth	Dive	0	0	1	1	0	0	0	1	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	0
Cwth	DropLine	0	1	1	1	0	0	1	1	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0
Cwth	Dropline Hydraulic	0	1	1	1	0	0	1	1	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0
Cwth	Dropline Manual	0	1	1	1	0	0	1	1	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0
Cwth	Fish Trap	1	1	1	1	0	0	1	1	0	0	0	0	1	1	0	1	1	0	0	1	1	0	0	0	0	0	0	1	1	1	0	0	1	0
Cwth	Fish Trap	1	1	1	1	0	0	1	1	0	0	0	0	1	1	0	1	1	0	0	1	1	0	0	0	0	0	0	1	1	1	0	0	1	0
Cwth	Gillnet	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1
Cwth	Handline	0	1	1	1	0	0	0	1	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0
Cwth	Jig	0	1	1	1	0	0	0	1	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0
Cwth	Pelagic Longline	0	1	1	1	0	0	0	1	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	0
Cwth	Minor Line	0	1	1	1	0	0	1	1	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0
Cwth	Net (gillnet)	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1
Cwth	Poling	0	1	1	1	0	0	0	1	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0
Cwth	Purse Seine	0	1	1	1	0	0	0	1	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	0
Cwth	Rod and Reel	0	1	1	1	0	0	0	1	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0
Cwth	Trawl	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0
Cwth	Trawl	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0
Cwth	Trotline	1	1	1	1	0	1	1	1	0	0	0	0	0	1	0	1	1	0	0	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1
Cwth	Troll	0	1	1	1	0	0	0	1	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0
Cwth	Trawl	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0
Cwth	Trawl (midwater)	0	1	1	1	0	0	1	1	1	1	1	0	1	1	1	1	1	1	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	0

Western Australia		North						North-west							South-west							
Jurisdiction	Fishing gear	Habitat Protection Zone	Marine National Park Zone	Multiple Use Zone	Special Purpose Zone	Special Purpose Zone (A)	Special Purpose Zone (B)	Habitat Protection Zone	Marine National Park Zone	Multiple Use Zone	Recreational Use Zone	Sanctuary Zone	Special Purpose Zone	Special Purpose Zone (A)	Habitat Protection Zone	Marine National Park Zone	Multiple Use Zone	Multiple Use Zone (A)	Special Purpose Zone	Special Purpose Zone (A)	Special Purpose Zone (B)	Special Purpose Zone (C)
WA	Beach Seine and Gillnet	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
WA	Beach Seine and Haul Net	0	1	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0
WA	Crab Trap	1	1	0	0	0	0	1	1	0	1	1	0	0	1	1	0	0	0	0	0	0
WA	Diving	0	1	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0
WA	Dropline	1	1	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0
WA	Dropline and Handline	1	1	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0
WA	Fish trap	1	1	0	0	0	0	1	1	0	1	1	0	0	1	1	0	0	0	0	0	0
WA	Fish trawling	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1
WA	Gillnet	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
WA	Gillnet ,Beach Seine and Haul Net	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
WA	Gillnet and Haul Net	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
WA	Gillnet and Longline	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
WA	Handline	0	1	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0
WA	Handline and Trolling	0	1	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0
WA	Lines (OA and FBL)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
WA	Lines and pot	1	1	0	0	0	0	1	1	0	1	1	0	0	1	1	0	0	0	0	0	0
WA	Longline	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
WA	Octopus pot	1	1	0	0	0	0	1	1	0	1	1	0	0	1	1	0	0	0	0	0	0
WA	Other	0	1	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0
WA	Other (hand collection)	0	1	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0
WA	Potting	1	1	0	0	0	0	1	1	0	1	1	0	0	1	1	0	0	0	0	0	0
WA	Purse Seine	0	1	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0
WA	Trap (G) Net	1	1	0	0	0	0	1	1	0	1	1	0	0	1	1	0	0	0	0	0	0
WA	Trawling	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1
WA	Trawling-Scallop	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	1
WA	Wading	0	1	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0

South Australia		South-west							
Jurisdiction	Fishing gear	Habitat Protection Zone	Marine National Park Zone	Multiple Use Zone	Multiple Use Zone (A)	Special Purpose Zone	Special Purpose Zone (A)	Special Purpose Zone (B)	Special Purpose Zone (C)
SA	Marine scalefish methods	1	1	1	1	0	0	0	0
SA	Purse Seine	0	1	0	0	0	0	0	0
SA	Trap	1	1	0	0	0	0	0	0

Northern Territory		North					
Jurisdiction	Fishing gear	Habitat Protection Zone	Marine National Park Zone	Multiple Use Zone	Special Purpose Zone	Special Purpose Zone (A)	Special Purpose Zone (B)
NT	Diving Hookah	0	1	0	0	0	0
NT	Drifting Gillnet	1	1	1	0	1	0
NT	Dropline	1	1	0	0	0	0
NT	Finfish Longline	1	1	1	1	1	1
NT	Hand Harvest/Hookah	0	1	0	0	0	0
NT	Hand Harvested	0	1	0	0	0	0
NT	Longlines	1	1	1	1	1	1
NT	Mobile Fish Trap	1	1	0	0	0	0
NT	Trawling	1	1	1	1	0	1
NT	Trolling	0	1	0	0	0	0

Queensland		Coral Sea						North					
Jurisdiction	Fishing gear	Habitat Protection Zone	Habitat Protection Zone (Reefs)	Marine National Park Zone	Sanctuary Zone	Special Purpose Zone (A)	Special Purpose Zone (B)	Habitat Protection Zone	Marine National Park Zone	Multiple Use Zone	Special Purpose Zone	Special Purpose Zone (A)	Special Purpose Zone (B)
QLD	Anchored gillnetting	1	1	1	1	1	1	1	1	1	0	1	0
QLD	Back Netting	0	1	1	1	0	0	1	1	0	0	0	0
QLD	Cast Netting	0	1	1	1	0	0	1	1	0	0	0	0
QLD	Collecting Coral	0	0	1	1	0	0	0	1	0	0	0	0
QLD	Collection	0	0	1	1	0	0	0	1	0	0	0	0
QLD	Diving	0	0	1	1	0	0	0	1	0	0	0	0
QLD	Drifting gillnetting	1	1	1	1	1	1	1	1	1	0	1	0
QLD	Dropline (Demersal longline)	1	1	1	1	0	1	1	1	1	1	1	1
QLD	Fish trapping	1	1	1	1	0	0	1	1	0	0	0	0
QLD	Fish trawling	1	1	1	1	1	0	1	1	1	1	0	1
QLD	Gillnetting	1	1	1	1	1	1	1	1	1	0	1	0
QLD	Handline	0	1	1	1	0	0	0	1	0	0	0	0
QLD	Haul Netting	0	1	1	1	0	0	1	1	0	0	0	0
QLD	Line	1	1	1	1	0	1	1	1	1	1	1	1
QLD	Line fishing	1	1	1	1	0	1	1	1	1	1	1	1
QLD	Ocean Beach Netting	0	1	1	1	0	0	1	1	0	0	0	0
QLD	Ring Netting	0	1	1	1	0	0	1	1	0	0	0	0
QLD	Scoop/Dab Netting	0	0	1	1	0	0	1	1	0	0	0	0
QLD	Stripe Netting/Set Pocket Net	0	1	1	1	0	0	1	1	0	0	0	0
QLD	Trawling	1	1	1	1	1	0	1	1	1	1	1	1
QLD	Trolling	0	1	1	1	0	0	0	1	0	0	0	0
QLD	Tunnel Netting	0	1	1	1	0	0	1	1	0	0	0	0

New South Wales		Temperate East						
Jurisdiction	Fishing gear	Habitat Protection Zone	Habitat Protection Zone (Lord Howe)	Marine National Park Zone	Multiple Use Zone	Multiple Use Zone (A)	Recreational Use Zone	Special Purpose Zone
NSW	Dropline	0	0	1	0	0	1	0
NSW	Danish seine trawl net (fish)	1	1	1	1	1	1	0
NSW	Driftline	0	1	1	0	0	1	0
NSW	Fish trap (bottom/demersal)	1	1	1	0	0	1	0
NSW	Handline	0	0	1	0	0	1	0
NSW	Jigging	0	0	1	0	0	1	0
NSW	Lobster trapping	1	1	1	0	0	1	0
NSW	Otter trawl net (fish)	1	1	1	1	1	1	0
NSW	Otter trawl net (prawns)	1	1	1	1	1	1	0
NSW	Poling	0	0	1	0	0	1	0
NSW	Spanner crab net	1	1	1	0	0	1	0
NSW	Skindiving	0	1	1	0	0	1	0
NSW	Setline (demersal)	1	1	1	1	0	1	1
NSW	Setline	1	1	1	1	0	1	1
NSW	Trolling	0	0	1	0	0	1	0
NSW	Trotline (bottom set)	1	1	1	1	1	1	1