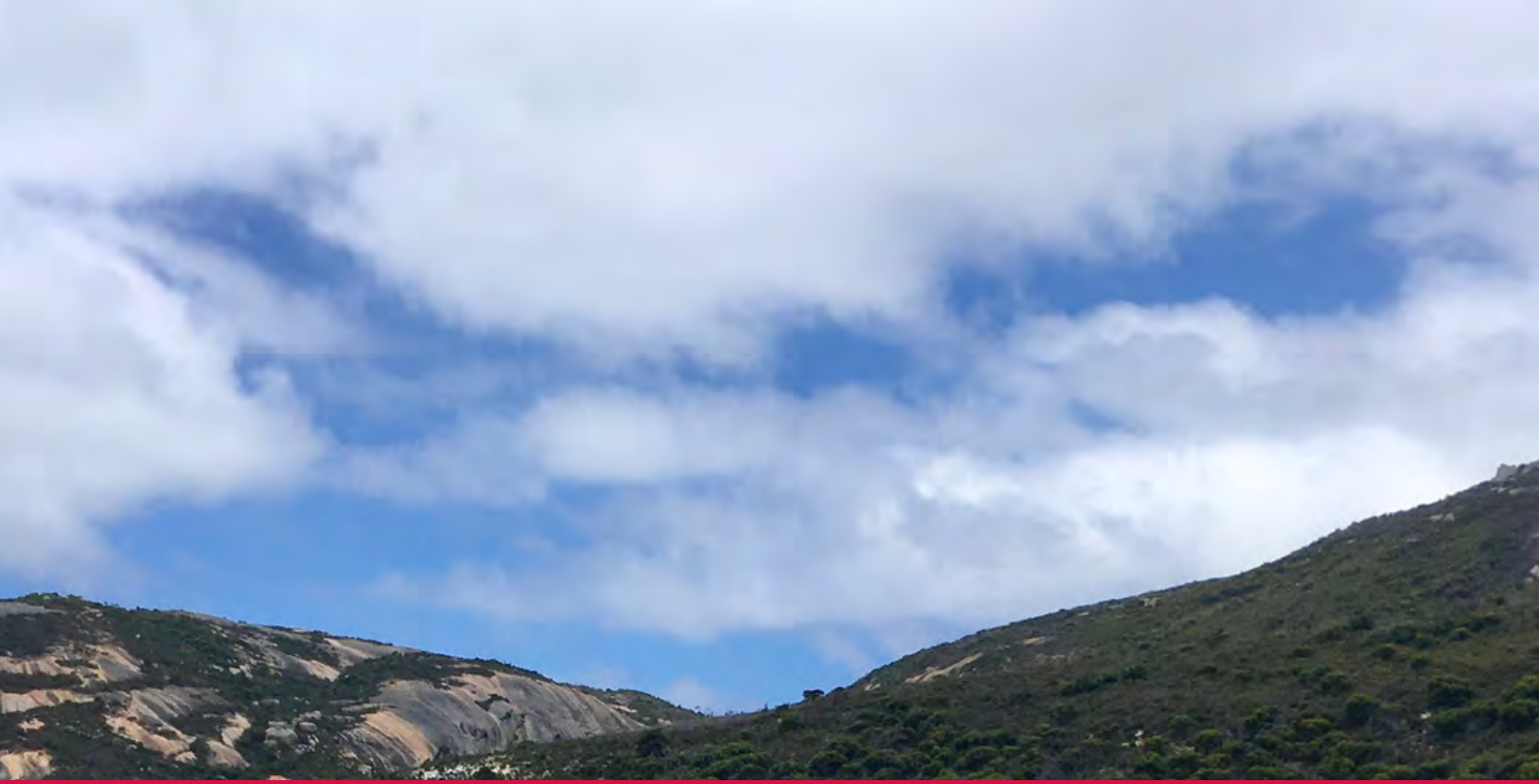


# 2023 Western Australia Beach Clean-up Report

Quantifying marine debris on the Western Australian coastline and marine environment





*Tangaroa Blue Foundation acknowledges the First Nations people as Traditional Owners and Custodians of Country across Australia, including the Land and Sea Country on which we live and work.*

*We pay our respects to their Elders past and present, and acknowledge their continuous relationship to this land and the ongoing cultures of Aboriginal and Torres Strait Islander peoples across Australia.*



# EXECUTIVE SUMMARY

This report summarises data gathered from the 2023 annual Western Australian Beach Clean-up event. Statistics are provided for the State of Western Australia (WA) and seven of the state's Natural Resource Management (NRM) regions. For each NRM region, the Land Sea Source Index (LSSI), density of debris and top 10 items collected are provided, and a single site has been chosen as a case study.

The LSSI is the estimated ratio of debris from local sources compared to offshore sources. The density of debris is calculated as the number of items per square metre, using an average site width of 45 m. This width was chosen so data is comparable to previous years and other programs led by Tangaroa Blue Foundation.

2023 marks the 19th year of the WA Beach Clean-up (WABCU) and saw increased clean-ups across the South Coast, allowing valuable insight into the region and new partnerships to be formed. Over a stretch of nearly 166 km along the distinctive Western Australian coastline, more than 1,400 volunteers from 50 organisations, volunteer groups, communities, and schools collectively contributed 3,081 hours (equivalent to over \$133,000 in volunteer time) to remove over 3.5 tonnes of debris.

Volunteer effort was again concentrated in the most populated South West and Peel-Harvey regions. Debris was densest on Christmas Island, with an average of 17.1 items/m<sup>2</sup>. This is likely caused by the extremely heavy (936 kg) mass of debris found there over just 3 events. On the mainland, debris was the most dense in the Perth region, with an average of 6.8 items/m<sup>2</sup> and least dense in the Peel-Harvey region, with an average of 0.01 items/m<sup>2</sup>.

Record volunteer numbers were experienced at the Bunbury Dolphin Discovery Centre's clean-ups as well as the Peel-Harvey estuary and foreshore clean-ups facilitated by Coastal Waste Warriors, Peel-Harvey Catchment Council, Estuary Guardians, Mandurah Cruises and the Department of Biodiversity, Conservation and Attractions (DBCA). This was the second year Tangaroa Blue Foundation teamed up with long-term partners Keep Australia Beautiful WA for a 4WD road trip, this time visiting the beautiful South Coast communities of Walpole, Denmark and Albany. With an increased presence of Tangaroa Blue Foundation staff and key partners at clean-ups in the region, collaborations with Traditional Owners, NRM groups, government authorities and schools allowed the opportunity for more in-depth data collection and future projects to be discussed and planned for 2024. Plastic was the most common material found across WA, with fishing items the most common category. The origins of debris are extremely variable across the state with the majority (87%) of debris in the Indian Ocean Territories estimated to be from offshore sources and more than 92% of debris from the Peel-Harvey and Perth regions estimated to be land-based. This is useful when designing and tailoring mitigation strategies for each region.

2023 has been an exciting year for plastic policy in WA, with the state government rolling out the second stage of WA's Plan for Plastics, which bans the use of many single-use plastic items, with more to be phased out in 2024 and 2025 and led to a noticeable reduction in the use of single-use plastic products. Similar policies have been introduced in other Australian States and around the globe. To know if policy interventions work, data (such as that contributed to the AMDI Database by Tangaroa Blue Foundation and volunteers) is needed before, during and after their implementation to measure impact.



# WHAT IS WABCU?






Since 2005, NRM organisations, community and Coastcare Groups, Traditional Custodians, businesses, schools and dedicated individuals have come together every October to clean the vast and stunning coastal areas and major rivers of Western Australia for the annual Western Australian Beach Clean-up. Now, in its 19th year, volunteers have covered some of the most remote corners of the state by 4WD, kayak, paddleboard and foot.

Interested parties simply register their event online via the Tangaroa Blue Foundation website to receive clean-up resources and all the information needed to run their event safely and effectively. Debris is collected and data entered into the Australian Marine Debris Initiative (AMDI) Database. All data collected from WABCU over the last 19 years has been entered into the AMDI Database. By continually monitoring these sites over time, we can identify areas where debris is most prevalent (i.e. debris 'hotspots'), provide data to support policy change, design and implement Source Reduction Plans (SRPs) and assess the effectiveness of these strategies at reducing debris over time.

We are grateful to long-term partners [Keep Australia Beautiful WA](#) and [Tallwood Custom Built Homes](#) for their support and welcomed new event supporters [Southern Ports Authority](#) and [GHD](#) to the Western Australian Beach Clean-up for 2023.

The Tangaroa Blue Foundation defines marine debris as man-made waste, litter and debris in any oceanic, coastal, inland water and shoreline environment.

## 19TH YEAR OF THE WABCU

	2023	2022	2021	2020
 <b>NUMBER OF EVENTS HELD</b>	<b>98</b>	<b>89</b>	<b>100</b>	<b>107</b>
 <b>NUMBER OF VOLUNTEERS</b>	<b>1,412</b>	<b>1,641</b>	<b>1,439</b>	<b>1,200</b>
 <b>VOLUNTEER HOURS</b>	<b>3,081</b>	<b>3,129</b>	<b>3,806</b>	<b>2,780</b>
 <b>DISTANCE COVERED (KM)</b>	<b>166,314</b>	<b>161,999</b>	<b>214,531</b>	<b>184,535</b>
 <b>WEIGHT REMOVED (KG)</b>	<b>3,517</b>	<b>4,646</b>	<b>3,230</b>	<b>3,210</b>

# TOP 10 ITEMS OF MARINE DEBRIS

INCLUDING THE INDIAN OCEAN TERRITORIES

	Items	Total Items	% of Total
1	Hard plastic remnants	30,118	36
2	Foam insulation & packaging (whole & remnants)	5,727	6.9
3	Lids and bottle caps, pump spray, flow restrictor & similar	4,405	5.3
4	Plastic packaging food (wrap, packets, containers)	4,310	5.2
5	Plastic straws, confection sticks, cups, plates & cutlery	3,967	4.8
6	Cigarette butts & filters	3,713	4.5
7	Soft plastic film remnants	3,701	3.2
8	Miscellaneous paper, labels & tickets	2,646	3.2
9	Rope & net scraps (<1m)	2,614	2.7
10	Paper & cardboard packaging	2,239	2.4

# TOP MATERIALS OF MARINE DEBRIS

INCLUDING THE INDIAN OCEAN TERRITORIES

	Materials	Total Items	% of Total
1	Plastic	61,916	75
2	Foam	6,178	7.5
3	Paper & Cardboard	5,105	6.2
4	Metal	2,925	3.5
5	Glass & Ceramic	2,805	3.4
6	Other*	1,884	2.3
7	Rubber	1,027	1.2
8	Cloth	592	0.7
9	Wood	437	0.5

\*Other materials is a broad category with mixed materials and includes sanitary items (tissues, nappies, condoms, cotton buds), food scraps, building and trades materials, organic materials, oil globules and tar balls, boat parts, wreckage & remnants, shoe parts (leather and fabric), electronics (appliances and batteries), Personal effects (wallets, money, keys, jewellery), soap, dry lubricant & glue, pet handling & care items, weather balloon parts, wax (surf wax, candles, paraffin and similar), unspecified non-plastic items and unidentified substances.

# TOP 10 ITEMS OF MARINE DEBRIS

EXCLUDING THE INDIAN OCEAN TERRITORIES

	Items	Total Items	% of Total
1	Hard plastic remnants	21,468	35
2	Cigarette butts & filters	3,713	6.1
3	Plastic packaging food (wrap, packets, containers)	3,669	6.0
4	Soft plastic film remnants	2,954	4.9
5	Miscellaneous paper, labels & tickets	2,646	4.3
6	Rope & net scraps (<1m)	2,285	3.8
7	Lids and bottle caps, pump, spray, flow restrictor & similar	2,284	3.8
8	Paper & cardboard packaging	2,239	3.7
9	Glass or ceramic broken	2,010	3.3
10	Plastic oddments	1,781	2.9

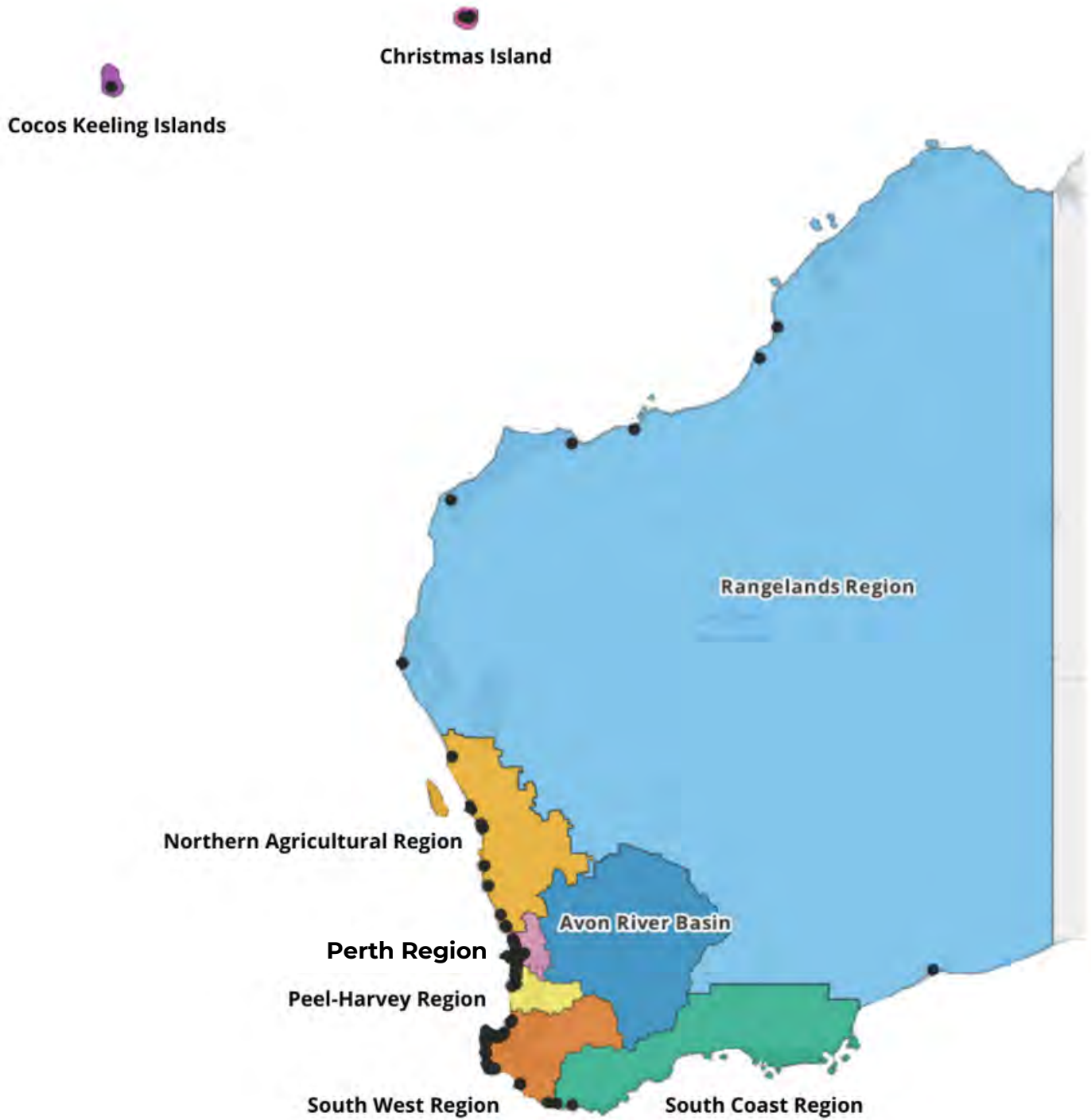
# TOP MATERIALS OF MARINE DEBRIS

EXCLUDING THE INDIAN OCEAN TERRITORIES

	Materials	Total Items	% of total
1	Plastic	45,189	74
2	Paper & Cardboard	5,105	8.4
3	Metal	2,921	4.8
4	Glass & Ceramic	2,800	4.6
5	Other*	1,861	3.1
6	Foam	1,332	2.2
7	Rubber	662	1.1
8	Cloth	592	1.0
9	Wood	437	0.7

\*Other materials is a broad category with mixed materials and includes sanitary items (tissues, nappies, condoms, cotton buds), food scraps, building and trades materials, organic materials, oil globules and tar balls, boat parts, wreckage & remnants, shoe parts (leather and fabric), electronics (appliances and batteries), Personal effects (wallets, money, keys, jewellery), soap, dry lubricant & glue, pet handling & care items, weather balloon parts, wax (surf wax, candles, paraffin and similar), unspecified non-plastic items and unidentified substances.

# WA NRM REGIONS



## CLEAN-UP DETAILS BY NRM REGION

Region	No. of Events	No. of Volunteers	Volunteer Hours	Weight (kg)	Total Items	Debris Density (pieces per m <sup>2</sup> )	Land Sea Source Index - LSSI (% local : % offshore)
<b>Indian Ocean Territories</b>	7	78	135	1,056	21,971	17.1	12:88
<b>Rangelands</b>	5	57	138	75	2,381	0.039	78:22
<b>Northern Agricultural</b>	2	95	140	25	460	0.011	82:18
<b>Perth</b>	16	260	400	342	56,385	6.79	95:5
<b>Peel-Harvey</b>	4	275	915	305	6,876	0.010	92:8
<b>South West</b>	44	437	1099	1635	26,113	0.094	36:64
<b>South Coast</b>	20	210	254	79	10,498	0.187	25:75



# TOP 10 ITEMS BY NRM REGION

	Indian Ocean Territories	Rangelands	Northern Agricultural	Perth	Peel-Harvey	South West	South Coast
1	Plastic bits & pieces (hard & solid)	Cigarette butts & filters	Glass or ceramic (broken)	Plastic bits & pieces (hard & solid)	Cigarette butts & filters	Plastic bits & pieces (hard & solid)	Plastic bits & pieces (hard & solid)
2	Foam insulation & packaging	Miscellaneous paper, labels & tickets	Plastic bits & pieces (hard & solid)	Plastic food packaging	Plastic food packaging	Primary plastic feedstock (nurdles, pellets, additives)	Rope & net scraps (<1m)
3	Straws, confection sticks, cups, plates & cutlery	Plastic food packaging	Aluminium cans	Plastic film remnants	Plastic oddments	Glass or ceramic (broken)	Plastic lids & tops, pump spray, flow restrictor & similar
4	Lids & tops, pump spray, flow restrictor & similar	Foil wrappers, packets, bladders & alfoil	Foam buoys (whole & parts)	Paper & cardboard packaging	Miscellaneous paper, labels & tickets	Plastic lids & tops, pump spray, flow restrictor & similar	Cigarette butts & filters
5	Plastic film remnants	Plastic film remnants	Cigarette butts & filters	Miscellaneous paper, labels & tickets	Plastic bits & pieces (hard & solid)	Rope & net scraps (<1m)	Plastic film remnants
6	Plastic drink bottles (water, juice, milk, soft drink)	Metal bottle caps, lids & pull tabs	Rope & net scraps (<1m)	Plastic oddments	Metal scraps & remnants	Plastic film remnants	Miscellaneous paper, labels & tickets
7	Plastic food packaging	Glass or ceramic (broken)	Unspecified plastic items	Cigarette butts & filters	Plastic film remnants	Plastic food packaging	Burnt plastic remnants
8	Rope & net scraps (<1m)	Plastic bits & pieces (hard & solid)	Plastic film remnants	Sanitary (tissues, nappies, condoms, cotton buds)	Glass beverage bottles	Paper & cardboard packaging	Plastic food packaging
9	Rubber remnants	Lids & tops, pump spray, flow restrictor & similar	Paper & cardboard packaging	Rope & net scraps (<1m)	Paper & cardboard packaging	Miscellaneous paper, labels & tickets	Glass or ceramic (broken)
10	Personal care & pharmaceutical packaging	Paper & cardboard packaging	Tape adhesive, electrical, duct, hazard marker & rolls	Plastic wrap non-food	Straws, confection sticks, cups, plates & cutlery	Commercial fishing remnants (float, pot, crate bits)	Foam insulation & packaging

# OPERATION CLEAN SWEEP

The annual WABCU report typically reports on macro items collected. However, some volunteers also collect microplastic items, including primary plastic feedstock. The number one microplastic item collected in the Perth NRM was primary plastic feedstock (nurdles, pellets, additives) with more than 40,000 feedstock items collected at Minim Cove, Mosman Park.

Operation Clean Sweep Australia is a comprehensive industry program committed to preventing and minimising plastic pellet, flake, powder and recyclate loss along the plastics value chain. Launched as part of the global Operation Clean Sweep initiative, it aims to eliminate plastic feedstock pollution in waterways and oceans by promoting best practices, providing resources, and fostering collaboration within the Australian plastics and logistics industries.

The initiative traces its roots back to the early 1990s when the Plastics Industry Trade Association of the USA initiated efforts to reduce pellet loss. This educational campaign emphasised the proper containment, reclamation, and disposal of resin pellets, culminating in the development and dissemination of materials under the name Operation Clean Sweep.

Operation Clean Sweep has now expanded internationally, including to Australia, and in scope, with a revitalised focus on achieving zero feedstock loss. The need for this initiative is evident around Australia but was implemented after surveys discovered plastic resin pellets in the Swan River in 2007. This led to the Department of Water and Environmental Regulation issuing field notices in 2012- long before other states were recognising what plastic feedstock pollution was or that it was escaping from domestic industrial estates from the plastics industry.



There are numerous Australian partners in this program including Tangaroa Blue Foundation, Chemistry Australia, New South Wales (NSW) Environment Protection Authority, NSW Department of Climate Change, Energy, the Environment and Water, and the Victorian (VIC) Environment Protection Authority (EPA). Both the NSW and VIC EPA are using this program to engage with the industry to reduce plastic feedstock loss. Together, they are strongly committed to promoting the initiative and encouraging plastics and logistics companies to participate. We encourage the Government of Western Australia to make mandatory the implementation of Operation Clean Sweep by the whole plastics supply chain.

Operation Clean Sweep is not only about local action but also about global impact. Operation Clean Sweep is being presented as a solution to feedstock loss in the UN Global Plastics Treaty negotiations. Through collaboration and concerted efforts, Operation Clean Sweep aims to make a significant contribution towards preserving marine environments worldwide.

For more information about Operation Clean Sweep please visit the website [www.opcleansweep.org.au](http://www.opcleansweep.org.au)

Photo: a small sample of the high density of pre-production plastics found at Minim Cove, Perth in 2022.  
(Credit: Claire O'Loughlin Ocean Remedy)

# CLEAN-UP LOCATIONS BY NRM

## INDIAN OCEAN TERRITORIES

Ethel Beach, Christmas Island  
Greta Beach, Christmas Island  
The Dales, Christmas Island  
Cocos Home Island Turtle Nest Beach,  
Cocos Keeling Islands

## NORTHERN AGRICULTURAL

Cape Burney Foreshore, Greenough River  
Drummond Cove

## PEEL-HARVEY

Coodanup Foreshore  
Doddi's Beach, Halls Head  
Multiple Sites, Dawesville Cut  
Pyramids Beach, Dawesville WA

## PERTH

Challenger Beach  
City Beach  
City Beach Park Surrounds  
City of York Bay beach  
Hillarys  
Minim Cove, Mosman Park  
North Mindarie Beach  
North Trigg Beach  
Palm Beach, Rockingham  
Secret Harbour  
Sorrento Beach, Sorrento,  
Thompson Bay, Rottnest Island  
Whitfords Nodes Park  
Yanchep Beach and Lagoon

## RANGELANDS

Bells Beach, Point Samson  
Esplanade Beach, Dampier  
Front Beach, Onslow  
Kanidal Beach and Twilight Cove  
Pretty Pool River and Beach, Port  
Hedland

## SOUTH COAST

Albany Town Jetty Foreshore, Albany  
Conspicuous Cliffs  
Eleven Mile Beach  
Fishery Beach, Bremer Bay  
Fourth - Twilight Beach, West Beach

## SOUTH COAST CONTINUED

Hellfire Bay  
Hollings Rd Riverside Walk, Wilson Inlet Denmark  
Lovers Cove, Esperance  
Lucky Bay,  
Middleton Beach, Albany  
Observatory Beach,  
Observatory Beach, West Beach  
Ocean Beach Carpark Denmark  
Ocean Beach, Denmark  
Rame Head, Peaceful Bay  
Short Beach, Bremer Bay  
Thistle Cove, Cape Le Grand National Park  
West Beach, Esperance

## SOUTH WEST

Augusta Multiple Sites, Rivermouth to Skippy Rock  
Binningup Beach  
Castle Rock  
Circus Beach  
Conto Spring  
Cosy Corner  
Cowaramup Bay  
Deepdene  
Eagle Bay Dog Beach  
East Augusta Foreshore  
Elizabeth Street Drain, Busselton  
Ellensbrook South  
Forrest Beach, Capel  
Foul Bay, Karridale  
Gallows  
Geographe Foreshore  
Hamelin Bay  
Hillview  
Injidup Beach South  
Jasper Beach  
Kabbijup Beach (3 Bears), Yallingup  
Koombana Bay, Bunbury  
Lighthouse Beach and Other Side Of The Moon  
Mandalay Beach  
Margaret Rivermouth to Joey's Nose  
Meelup Beach  
Old Dunsborough Boat Ramp  
Port Geographe Marina  
Quarry Bay  
Shelly Cove, Dunsborough,  
Smiths Beach  
South Beach, Boranup,  
White Point, Scott River East Nannup  
Windows, Cowaramup  
Wonnerup Beach  
Yeagarup Beach, Northcliffe,

# CLEAN-UP DATA BY CASE STUDY

One site from each NRM region was chosen as a case study for further investigation. These sites were chosen based on long-term data, an unusual density of debris, an interesting item or story, or the cultural, ecological or social significance of the site. A map of the NRM regions and sites is on page 7, a list of clean-up locations on page 11, and summary statistics are on pages 8 and 9.



Erin Osbourne from Rockingham Beach Cleans runs regular clean-ups in the Rockingham area. For the 2023 WABCU they conducted a clean-up at Palm Beach.  
(Credit: Erin Osbourne Rockingham Beach Cleans)

# INDIAN OCEAN TERRITORIES

## CHRISTMAS ISLAND

One of WA Beach Clean-Up's most adventurous locations.

Christmas Island, part of the Indian Ocean Territories of Australia, is a remote haven located 2,600 km north west of Perth and 350 km from Indonesia. It is home to supremely biodiverse jungle and reef environments with many animals found nowhere else on earth. Given its proximity to Indonesia, Christmas Island faces the brunt of plastic debris densities brought by trade winds and ocean currents. Out of all NRM regions, the Indian Ocean Territories had the highest debris density, with an average of 17.1 items/m<sup>2</sup> across all Indian Ocean Territories WABCU events.

Christmas Island's coastline is a near-continuous sea cliff that is up to 20 metres high in some places with breaks in the cliffs giving way to shallow bays and small beaches. This rugged landscape and remoteness can make it challenging to conduct clean-ups at some sites, such as Sydney's Dale. However, Sydney's Dale provides important habitat for the endemic blue crabs and many other land crabs and is listed as a Wetland of International Importance. In recognition of this important site, it became one of WABCU's most adventurous locations this year.

Local Tangaroa Blue Foundation project coordinator Hayley Cook and eighteen Christmas Island community members headed out on an off-trail 8 km hike to Sydney's Dale, deep inside the National Park with only a GPS and map to find this beach. Following the natural contours of this spring-fed water source all the way to the ocean, volunteers collected 5 bags of marine debris at the beach, weighing a total of 4.5 kg, consisting of almost 4,900 items, and a debris density of 47.6 items/m<sup>2</sup>. Notable items included 14 thongs, 89 drink bottles (43% of them had identifiable branding on them - with bottles coming from Malaysia, Indonesia, and China), and 4,708 pieces of Styrofoam.

This annual event would not be possible without the coordination of Island Care Christmas Island and the logistical mapping genius of the Christmas Island Adventurers.

In addition to general clean-ups like that conducted at Sydney's Dale, Hayley conducts quarterly monitoring at five beach sites around the island. Monitoring involves standardised scientific surveys conducted regularly, helping us understand how debris moves from sources like rivers to the ocean. It also offers insights into overall debris trends within the management area. Data from clean-ups and monitoring informs our impact assessment, enhances data quality, and amplifies the Christmas Island community's voice in international debris discussions, including the UN Global Plastics Treaty. International collaboration is critical considering 90% of debris collected is from offshore sources.

Tangaroa Blue Foundation's work on Christmas Island is generously funded through the Indian Ocean Territories Marine Parks Grant.



**NUMBER  
OF EVENTS** 1



**NUMBER OF  
VOLUNTEERS** 19



**VOLUNTEER HOURS** 19

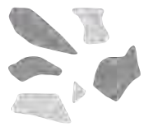


4.5  kg

**WEIGHT IN KILOGRAMS**

**TOTAL ITEMS**

**4,874**



**DEBRIS DENSITY**

**47.6** pieces per m<sup>2</sup>

**LAND SEA SOURCE INDEX**

**10:90**

■ Land ■ Sea



**TOP ITEMS**



Foam insulation & packaging (whole & remnants)



Plastic drink bottles (water, juice, milk, soft drink)



Rubber remnants

4	Rubber footwear & thongs	5	Building & trades materials, fixings & fittings	6	Hard plastic remnants	7	Personal care & pharmaceutical packaging
8	Cigarette lighters	9	Commercial fishing remnants (float, pot, crate bits)	10	Plastic Straws, confection sticks, cups, plates & cutlery		

Top: Sydneys Dale- the limestone formation and deep caverns at Sydneys Dale act as debris traps at high tides.  
 Right: a sample photo of the typical debris found at Sydneys Dale, Christmas Island..  
 (Credit: Tangaroa Blue Foundation)

# RANGELANDS

## PRETTY POOL CREEK AND BEACH, PORT HEDLAND

Pretty Pool Creek and Beach is a picturesque coastal area located in Port Hedland, Western Australia in the traditional land and sea country of the Kariyarra people. Pretty Pool Creek is a scenic waterway utilised for recreational activities such as fishing and boating, while Pretty Pool Beach, adjacent to the river, offers sandy shores and clear blue waters ideal for swimming, sunbathing, and beachcombing. Both the river and beach are popular destinations for locals and visitors seeking outdoor enjoyment and relaxation along the coast. It is also an important nesting area for Flatback turtles that nest along the far eastern beach area from October to March each year. Local Kariyarra rock carvings, close to the Pretty Pool area depict sea turtles; these rock carvings have been dated back to approximately 12,000 years of age.

The combination of a small suburban park and playground, a mangrove lined creek and an important beach area with relatively intact, spinifex covered primary and secondary dunes, entices local community members to come, collect litter and help the local environment in a meaningful way.

Volunteers collected 30 kg along just ~260 m of coastline equating to 0.085 items/m<sup>2</sup>. The majority (82%) of this debris is likely to be from land-based sources (according to the LSSI). The popular usage of the area predominantly dictates the litter composition collected from the site. The top 3 items found were cigarette butts & filters, plastic food packaging food and foil wrappers, packets, bladders & alfoil.

The first data collected from this site was in 2014 and this site has been a regular registration of the WA Beach Clean-Up for 9 years. The total weight and number of items collected at this site during each WABCU event had been declining since 2018, however, 2023 saw a spike in the weight and number of items collected (Fig 1). This site is lovingly cared for by the Care for Hedland Environmental Association and the wider community, who are long-term supporters of this event. They also collect litter during regular beach turtle monitoring walks each Monday, Wednesday and Friday from October to March.

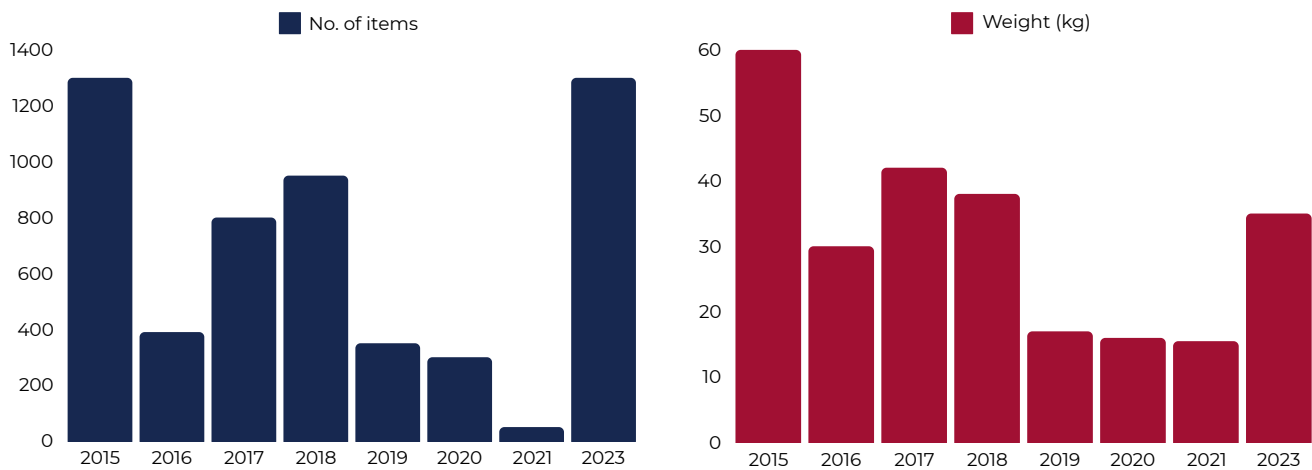


Figure 1. The (a) number of items and weight (b) collected at Pretty Pool Creek and Beach during WABCU events.



**NUMBER OF EVENTS 1**



**NUMBER OF VOLUNTEERS 6**



**VOLUNTEER HOURS 18**



**30**  kg

**WEIGHT IN KILOGRAMS**

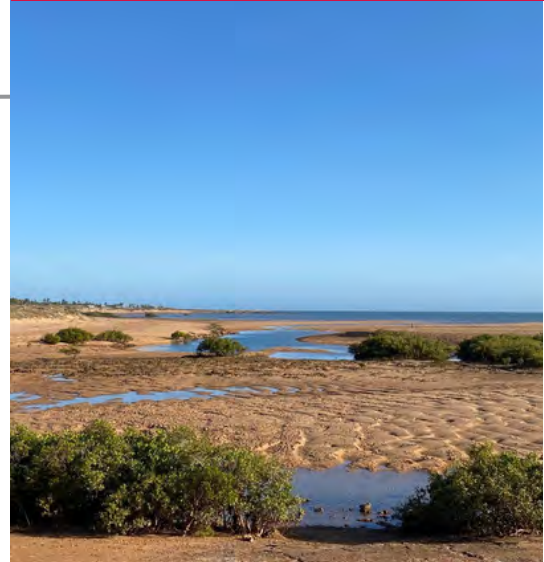
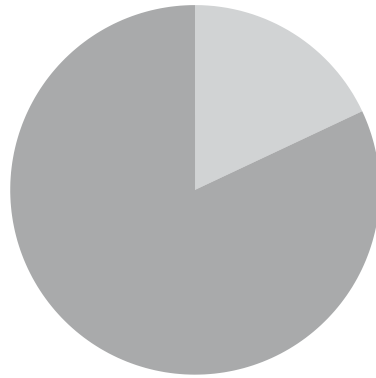
**TOTAL ITEMS**  
**1,362**

 **DEBRIS DENSITY** **0.085** pieces per m<sup>2</sup>

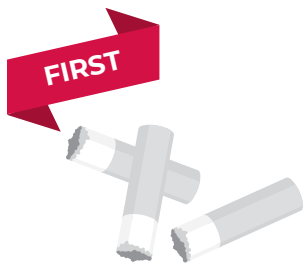
**LAND SEA SOURCE INDEX**

**82:18**

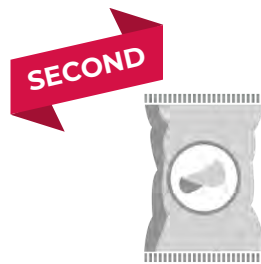
 Land  Sea



**TOP ITEMS**



Cigarette butts & filters



Plastic packaging food (wrap, packets, containers)



Foil wrappers, packets, bladders & alfoil

<b>4</b>	Paper & cardboard packaging	<b>5</b>	Miscellaneous paper, labels & tickets	<b>6</b>	Metal bottle caps, lids & pull tabs	<b>7</b>	Lids and bottle caps, pump spray, flow restrictor & similar
<b>8</b>	Hard plastic remnants	<b>9</b>	Glass or ceramic broken	<b>10</b>	Aluminium cans		

Top: Volunteers in 2023 collecting bottles and cans. Since the implementation of the container deposit scheme, the volunteers have noted a decline in how many of these they collect during their WABCU clean-up. Right: Pretty Pool Creek and Beach Site.

(Credit: Care For Hedland Environmental Association Inc)



# NORTHERN AGRICULTURAL DRUMMOND COVE

Drummond Cove is a seaside town that is traditionally owned by the Yamatji Peoples. Drummond Cove Beach is a curving west-facing 1.3 km long beach sheltered by a chain of patchy reefs, which extend a few hundred metres offshore. Drummond Cove is important as its reefs are used for swimming, snorkelling and fishing, providing both key environmental services but also important social and recreational infrastructure. There are six car parks and two areas for beach boat launching and vehicles are permitted to access the beach.

The Drummond Cove Beach clean-up was conducted by the Leaning Tree Steiner School with assistance from Coastal Officers from the Northern Agricultural Catchments Council. Volunteers gathered at the Drummond Cove foreshore immediately south of Batten Hall under the new shade sail provided by the Progress Association. The area is used for ocean and beach-based activities. The sheltered bay means safe swimming for families. The closer reefs are easily accessed by younger folk for snorkelling and the outer reefs are very popular for crayfishing. The group chose to visit the site because it is only 2 ½ km from their school and they are trying to ‘form a relationship’ with the space.

The older children ventured both further north and south of the hall area and the younger ones closer. The senior students did the evaluation and collation of the rubbish.

The hall has overnight camping for travellers and is very popular. There is a beach with boat launching for smaller vessels. The foreshore was originally home to many beach cottages but the peppercorn leases ended some 15 years ago and the site has been returned to native vegetation. This is a work in progress and the Leaning Tree Steiner School works hard to protect the dune plants and promote their importance to the kids. They even planted 1000 seedlings in 2022.

The team of 90 volunteers covered almost 2 km of coastline collecting over 15 kg of debris in 1.5 hours. As the estuary flows from nearby residential areas and out to sea, it was not surprising that more than three-quarters of the debris (77%) came from land-based sources, although debris was not very dense in this area with just 0.008 items/m<sup>2</sup>. Broken glass or ceramics, aluminium cans and glass beverage bottles were amongst the top 3 items found, which is unsurprising as this is a popular spot for recreational and family activities.



**NUMBER  
OF EVENTS 1**



**NUMBER OF  
VOLUNTEERS 90**



**VOLUNTEER HOURS 135**



**15.6**  **kg**  
**WEIGHT IN KILOGRAMS**

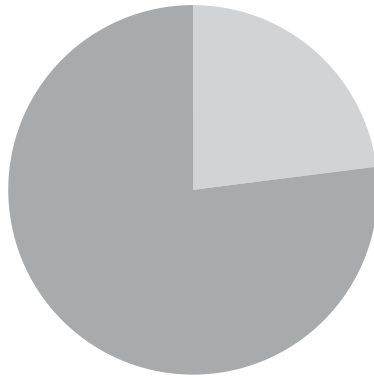
**TOTAL ITEMS**  
**309**

 **DEBRIS DENSITY** **0.008** pieces per m<sup>2</sup>

**LAND SEA SOURCE INDEX**

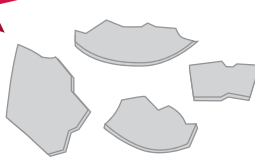
**77:23**

 **Land**  **Sea**




**TOP ITEMS**

**FIRST**



Glass or ceramic broken

**SECOND**



Aluminium cans

**THIRD**



Glass beverage bottles

<b>4</b>	Foam buoys (whole & parts)	<b>5</b>	Cigarette butts & filters	<b>6</b>	Unspecified plastic items	<b>7</b>	Paper & Cardboard packaging
<b>8</b>	Rope & net scraps (<1m)	<b>9</b>	Wooden fishing items	<b>10</b>	Plastic bits & pieces (hard & solid)		

Top: The Year 2 Class set off north with their gloves, bag and water bottles to collect marine debris. Right: The Leaning Tree Steiner School students getting their safety briefing before heading out to collect marine debris. (Credit: Mike Friday)

# PERTH CHALLENGER BEACH

Challenger Beach and the nearby City of Kwinana are within the Traditional lands of the Noongar people and sit at the border between the Whadjuk and Pindjarup Traditional Owner groups. This beach is renowned amongst locals and tourists for its fine white sand, bordering rocky bushland and glistening blue water and is popular for recreational fishing, walking, snorkelling and picnicking. This was reflected by the LSSI, which indicated that two-thirds (66%) of debris came from land-based sources. The top 3 items found were plastic film remnants (bits of plastic bag, wrap, etc.), plastic food packaging and gas, volatile liquid capsules & cans. Typically, gas, volatile liquid capsules and cans are not in the top 3 items found. However, during this event, the team found 129 individual nitrous oxide bulbs, also called 'nangs'.

Challenger Beach has been cleaned for the WABCU by long term partners Perth NRM since 2012, removing more than 1.8 tonnes of debris to date. The total weight removed decreased from 2016 to 2018 but increased slightly since 2018 (Fig 2). Compared to 2022, a heavier mass of debris (45 kg more) was found this year, however, the density of debris declined from 0.055 items/m<sup>2</sup> in 2022 to 0.032 items/m<sup>2</sup> in 2023. As the majority of the debris is likely from land-based sources, Challenger Beach may be the ideal location to implement local mitigation efforts such as bins and signage. This clean-up was possible thanks to the effort of Perth NRM, Alcoa, Tangaroa Blue Foundation and community volunteers.

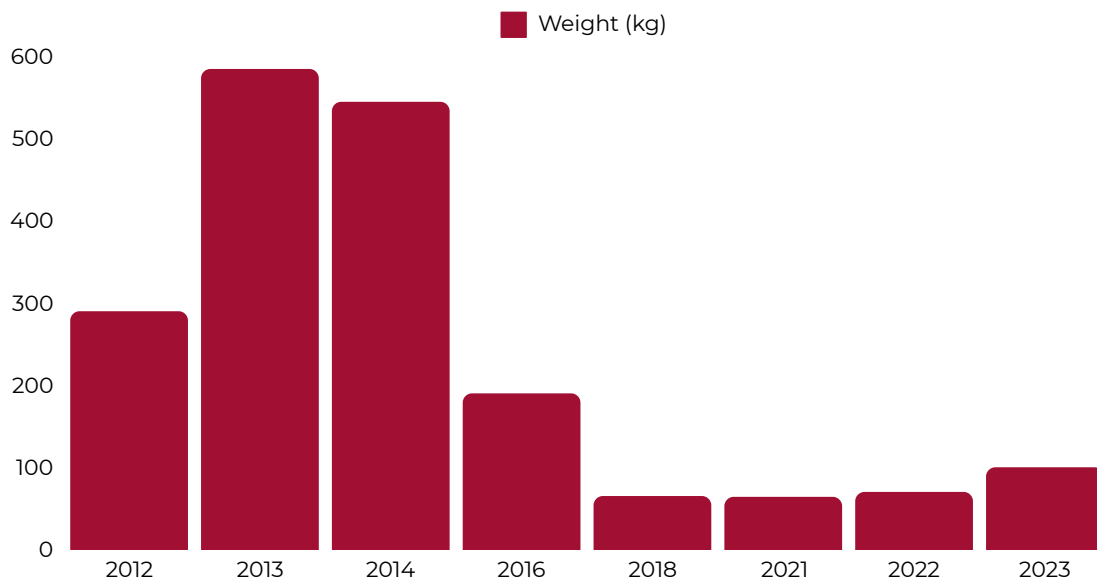


Figure 2. Total weight of debris collected from Challenger Beach WABCU events since 2012.



**NUMBER OF EVENTS 1**



**NUMBER OF VOLUNTEERS 23**



**VOLUNTEER HOURS 46**



**107**  **kg**  
**WEIGHT IN KILOGRAMS**

**TOTAL ITEMS**  
**1,228**

 **DEBRIS DENSITY 0.032 pieces per m<sup>2</sup>**

**LAND SEA SOURCE INDEX**

**66:34**

 Land  Sea



**TOP ITEMS**

**FIRST**



Plastic film remnants (bits of plastic bag, wrap etc)

**SECOND**



Plastic food packaging

**THIRD**



Gas, volatile liquid capsules & cans

<b>4</b>	Miscellaneous paper, labels & tickets	<b>5</b>	Plastic lids and bottle caps, pump spray, flow restrictor & similar	<b>6</b>	Sanitary (tissues, nappes, condoms, cotton buds)	<b>7</b>	Plastic bits & pieces (hard & solid)
<b>8</b>	Plastic wrap non-food	<b>9</b>	Paper & cardboard packaging	<b>10</b>	Cloth, clothing, hats and towels		

Top: Aluminium cans and gas volatile canisters (nangs) were in the top 3 items recorded at this site.  
 Right: The team from Alcoa were all smiles for their WA Beach Clean-Up event with Perth NRM and Tangaroa Blue Foundation at Challenger Beach, Perth.  
 (Credit: Cheri Tiglias, Alcoa)

# PEEL-HARVEY COODANUP FORESHORE

Coodanup is along the foreshore of the Dawesville Estuary within the Traditional land of the Binjareb people of the Noongar Nation and is located in the City of Mandurah, or “Mandjoogoordap” which translates to “meeting place of the heart”. These waters provide an important home to resident and visiting dolphins and a landing pad for migratory birds travelling along the East Asian-Australasian Flyway. The local Mandurah City Council, community and research groups recognise this importance and are committed to caring for the local environment and preserving it for future generations. The area is a popular spot for fishing, walking and picnicking, which is reflected in the top 3 items found there: plastic food packaging, cigarette butts and filters, and hard plastic remnants. These were the same top three items as in 2022. According to the LSSI, the vast majority (97%) are likely to be from land-based sources. Debris density at the estuary increased from 0.016 items/m<sup>2</sup> in 2022 to 0.021 items/m<sup>2</sup> in 2023.)

Since 2019, as part of the Peel-Harvey Catchment Council Wetlands Weekender event, ‘Pave the Way’, the Coastal Waste Warriors (CWW) have partnered with Peel-Harvey Catchment Council, Department of Biodiversity, Conservation and Attractions (DBCA) and Estuary Guardians to organise clean-ups at Coodanup and Dawesville. This event is a celebration of the many migratory birds that visit this estuary and aims to clean-up their feeding grounds before their heralded arrival. CWW are one of the most active clean-up groups in South Western Australia and have been long-term contributors to the AMDI, providing important baseline data for the Mandurah region.



**NUMBER OF EVENTS 1**



**NUMBER OF VOLUNTEERS 65**



**VOLUNTEER HOURS 97.5**



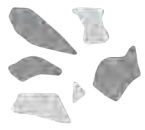
The Mandurah Community coming together to remove an incredible 252 kilograms across 3 sites in Dawesville as part of the Luca's Legacy event (Credit: Tiffany McLean)



62  kg

**WEIGHT IN KILOGRAMS**

**TOTAL ITEMS**  
**2,302**

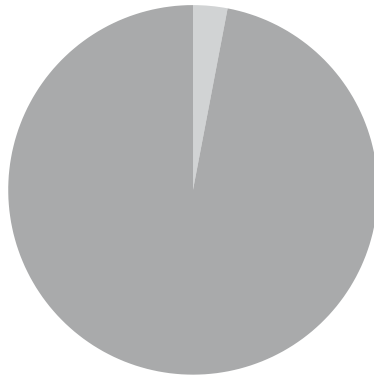


**DEBRIS DENSITY** **0.021** pieces per m<sup>2</sup>

**LAND SEA SOURCE INDEX**

**97:3**

 Land  Sea



**TOP ITEMS**

**FIRST**



Plastic food packaging

**SECOND**



Cigarette butts & filters

**THIRD**



Plastic pieces (hard & solid)

4	Plastic film remnants	5	Miscellaneous paper, labels & tickets	6	Paper & cardboard packaging	7	Plastic oddments
8	Plastic straws, confection sticks, cups, plates, & cutlery	9	Plastic wrap non-food	10	Sanitary (tissues, nappies, condoms, cotton buds)		

Top: Some of the young volunteers participating in the 'Pave the Way' event where they collected marine debris helping to protect the migratory birds that visit this estuary. Right: Some of the large debris collected at the 'Pave the Way' event hosted by Coastal Waste Warriors Peel-Harvey Catchment Council, Department of Biodiversity, Conservation and Attractions (DBCA) and Estuary Guardians (Credit: Karen Lyons)

# SOUTH WEST

## MILYEANNUP COAST, EAST AUGUSTA

The East Augusta coastline is within Wadandi and Pibelmen Boodja. The Wadandi people have been hunting and gathering food along the coast, waterways and forests for over 40,000 years, creating strong cultural and spiritual ties to the land and waters. This coastline is rugged and remote, with very little access unless permission is granted by private landholders. Long term Tangaroa Blue Foundation volunteer Boyd Rowe has been removing debris from this coastline for over 20 years, with permission and assistance from local landowners and farmers. The coastline sits adjacent to a shipping lane and the Leeuwin current. The Leeuwin Current is a warm ocean current that flows southward along the western coast of Australia. Originating from the tropics, particularly from Indonesia, it brings warm tropical waters to the cooler southern regions, influencing the climate, marine ecosystems, and weather patterns along the coast. Known for its biodiversity and role in shaping coastal environments, the Leeuwin Current plays a vital role in supporting marine life and influencing regional climate conditions and it is known to carry marine debris from thousands of kilometres away. Heavy winter swells bring larger debris loads; heavy erosion affects sections of the coastline here and has exposed historical debris and tonnes of trawling rope which Boyd is systematically removing with the help of local farmer Jasper. In 2023, the top 3 items found by Boyd were hard plastic remnants, rope and net scraps less than 1 m in length, and plastic lids & tops, the majority (80%) of which are likely to be from sea-based sources (according to the LSSI).

During the 2023 WABCU event, Boyd collected 423 kg of debris in 5 hours, equating to a density of 0.0008 items/m<sup>2</sup>. Boyd's passion and dedication to removing marine debris resulted in him being formally recognised for his exceptional work spanning over two decades in safeguarding our coastal environment at the Conservation Council of WA's annual Community Conservation Awards. Boyd's dedication earned him the award for Outstanding Volunteer, a testament to his enduring commitment to his love for the Margaret River region and its incredible coastline.



**NUMBER  
OF EVENTS 1**



**NUMBER OF  
VOLUNTEERS 1**



**VOLUNTEER HOURS 5**





**423**   
**WEIGHT IN KILOGRAMS**

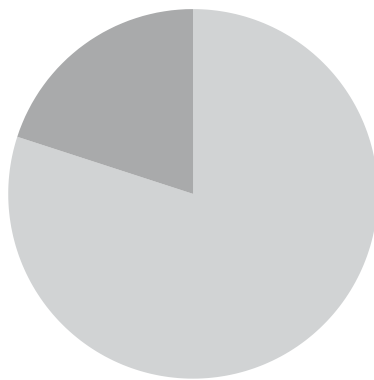
**TOTAL ITEMS**  
**528**

 **DEBRIS DENSITY** **0.0008** pieces per m<sup>2</sup>

**LAND SEA SOURCE INDEX**

**20:80**

 Land  Sea



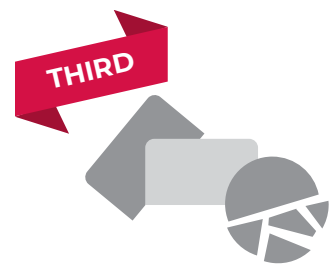
**TOP ITEMS**



Plastic pieces (hard & solid)



Rope & net scraps (<1m)



Plastic lids & tops, pump spray, flow restrictor & similar

<b>4</b>	Plastic film remnants	<b>5</b>	Commercial fishing traps, pots, & intact parts	<b>6</b>	Personal care & pharmaceutical packaging	<b>7</b>	Foam buoys (whole & parts)
<b>8</b>	Packaging accessories (seals, reels, spools, handles)	<b>9</b>	Commercial fishing remnants (float, pot, crate bits)	<b>10</b>	Foam drift net floats		

Top: A stretch of the 30 kilometre coastline that is surveyed for marine debris every 6 weeks by long term volunteer, Boyd Rowe. (Credit: Boyd Rowe)  
 Right: A sample photo of the typical debris found along the remote and rugged Millyeannup Coast, East Augusta (Credit: Tangaroa Blue Foundation)



# SOUTH COAST ELEVEN MILE BEACH WA

The first WABCU collaboration between the Esperance Tjaltjraak Native Title Aboriginal Corporation (ETNTAC) and Tangaroa Blue Foundation occurred on Eleven Mile Beach, near Kepa Kurl (Esperance). Working together, the team covered over 4.5 kilometres of coastline, removing 25 kg of marine debris. The beaches around Kepa Kurl were in good condition, a nod to regular clean-ups by not only the ETNTAC crew but all of the community highlighting the strong environmental stewardship on Wudjari Country. The top three items found were hard plastic remnants, rope and net scraps less than 1 m in length, and plastic lids and tops. Debris density was 0.013 items/m<sup>2</sup>. Of the debris found, the majority (88%) is estimated to be from offshore sources, likely brought in by wind, swell and currents. The ETNTAC crew were a pleasure to work with, providing cultural knowledge of the area and making light work of the AMDI auditing. It was clear that Dr. Jenn Lavers had been providing sorting and auditing training to the staff. This was Project Coordinator Casey's first time to this part of the South Coast and she was absolutely blown away by the raw beauty of the beaches and the engagement shown by WABCU sponsors Southern Ports Authority and South Coast NRM.



**NUMBER OF EVENTS 1**



**NUMBER OF VOLUNTEERS 8**



**VOLUNTEER HOURS 16**



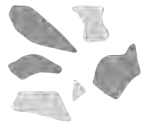


25  kg

**WEIGHT IN KILOGRAMS**

**TOTAL ITEMS**

**1,066**



**DEBRIS DENSITY**

**0.013** pieces per m<sup>2</sup>

**LAND SEA SOURCE INDEX**

**12:88**

 Land  Sea



**TOP ITEMS**

**FIRST**



Plastic pieces (hard & solid)

**SECOND**



Rope & net scraps (<1m)

**THIRD**



Plastic lids & tops, pump spray, flow restrictor & similar

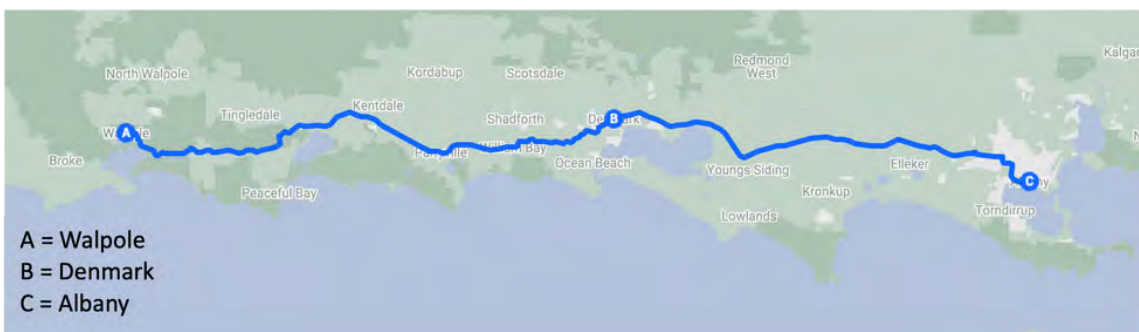
4	Burnt plastic remnants	5	Strapping band whole and scraps	6	Plastic film remnants	7	Plastic drink bottles (water, juice, milk, soft drink)
8	Foam insulation & packaging	9	Bleach and cleaner bottles	10	Personal care and pharmaceutical packaging		

Top: 11 Mile Beach, the last stop along the Great Ocean Drive before heading back towards the town of Esperance. Right: sorting and auditing back at ETNTAC headquarters in Esperance. (Credit: Tangaroa Blue Foundation)

# MAJOR WINS

In the second annual road trip, Tangaroa Blue Foundation WA project coordinator, Casey Woodward joined Keep Australia Beautiful WA officers, Samantha Culbertson and Anna Cross to drive over 730 km in Southern WA, to engage with schools, partners and communities. Over 5 days, the team was joined by 121 volunteers in Albany, Denmark, and Walpole to complete 5 clean-ups, removing 39.5 kg of debris from 5.5 km of coastline.

This was a fantastic opportunity to connect with AMDI partners such as South Coast NRM, DBCA Walpole and Keep Albany Beautiful as well as engage new school groups like Australian Christian College, Kwoorabup Nature School and our newest WABCU sponsor Southern Ports Authority. Each of the more than 3,300 pieces of debris found was categorised, counted and added to the AMDI Database.



# CONTRIBUTING ORGANISATIONS

Tangaroa Blue Foundation thanks Keep Australia Beautiful WA, Tallwood Custom Build Homes, Southern Ports Authority, GHD, and local government authorities around the state, as well as the dedicated volunteers for their ongoing support for this annual event. We would also like to give special thanks to the team from the University of Western Australia Guild Micro-Volunteering program who helped pack the clean-up kits again this year.

Adventure Sailing  
Alcoa  
Alkimos College  
Alkimos Surf Life Saving Club  
Bassendean Primary River Rangers  
Brick and Stone Creations  
Busselton Senior High School  
Cervantes Primary School  
City Beach Primary  
City of Bunbury  
City of Greater Geraldton  
City of Joondalup  
City of Kwinana  
City of Wanneroo  
Clean Seas Co  
Coastal Waste Warriors  
College Row School  
Cornerstone Christian College  
Department of Biodiversity,  
Conservation and Attractions  
Department of Parks and Wildlife  
Service  
Dolphin Discovery Centre  
Dongara Community Resource Centre  
Dongara District High School  
Eco Surf Australia  
Environmental Resources  
Management Australia  
Eyre Bird Observatory  
Gage Roads  
Gero Clean-Up Crew  
Great Southern Grammar  
Greenough River Friends  
Island Care Christmas Island  
Kalbarri District High School  
Kennedy Bay Coastcare  
La Grange Remote Community School  
Ledge Point Coastcare  
Lendlease  
Margaret River Brewhouse  
Microplastix  
Minderoo Foundation  
Nature Conservation Margaret River  
Naval Base Holiday Association  
Northern Agricultural Catchments Council  
Ocean Remedy  
Pemberton Discovery Tours  
Perth NRM  
Pilbara Ports Authority  
Prevelly Penguins  
Quinns Rock Environmental Group  
Rockingham Beach Cleans  
Saltwater Cleanups Western Australia  
Salty Frogs Beach Clean Up  
Sea Shepherd  
Secret Harbour Coastal Crew  
Shire of Cocos Keeling Islands  
Summer Salt Market  
Tangaroa Blue Foundation  
TECHNIP FMC  
The Leisure Collective  
Track Care Western Australia  
Tronox  
University of Western Australia Student Guild  
Micro-Volunteering Program  
Vasse Primary School  
West Pilbara Turtle Program

Thank you to all the volunteers, organisations and partners that contributed to the 2023 WA Beach Clean-up, this important event would not have been possible without each of you.



[www.tangaroablue.org](http://www.tangaroablue.org)

