

# **MARINE DEBRIS – ENGAGING THE COMMUNITY AND DEVELOPING PRACTICAL LONG TERM SOLUTIONS TO CLEANING UP THE COAST**

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## **Abstract**

The removal and prevention of marine debris remains one of the major environmental issues worldwide. The Australian Marine Debris Initiative (AMDI) in partnership with a range of Eurobodalla community groups and organisations is tackling the issue at its source.

The AMDI is an Australian-first study into the origin of rubbish in our oceans and waterways. It has more than 100 000 volunteers and partners nationwide and recently recorded its 10 millionth item of marine debris. The program aims to collect data consistently from all groups doing clean ups around the country to get an understanding of the marine debris products and where they are coming from.

Eurobodalla Shire Council and volunteers from the Eurobodalla Marine Debris Working Group have been working with Tangaroa Blue, coordinator of the database, since 2014 cleaning beaches and estuaries, logging data and now using that data to design and implement marine debris source reduction plans. Eurobodalla is one of the top five contributors to the database.

Council has escalated the volunteer base by training groups in the community who go on to regularly clean up designated sites or support the program in other ways. Local partners include the Disability Trust, Hope House (homeless and rehabilitation program), primary schools and high schools, National Parks and Wildlife Service, Batemans Marine Park, Nature Coast Marine Group, Clean Coast Collective, Young Legends, Seaside Scavenge, oyster growers, local businesses, surf schools, dive clubs, and surf clubs.

At a local level, the data has been able to support the development of new initiatives including a ban on balloon releases, and drinking water refill stations and at a state level contribute to the Container Deposit Scheme and lobbying towards a plastic bag ban.

Last year Eurobodalla made over 14 000 entries to the database. The highest recorded item is hard plastics.

The resources needed to set up a simple and engaging data collection and marine debris clean-up program are established and ready to use. We highly recommend other councils and volunteer groups to take it up. Together we can escalate our response to reducing marine debris at its source.

## **Australian Marine Debris Initiative Database**

Marine debris is defined as any persistent, manufactured or processed solid material discarded, disposed of or abandoned into the marine and coastal environment. (UN Environment Program, 2009).

The Australian Marine Debris Initiative (AMD) Database, is the most comprehensive collection of marine debris data in the country, containing over 11 million items collected since its establishment in 2004. Items are categorised into more than 130 types to give an exact picture of what types of rubbish occur in certain areas (Appendix 1 shows the categories on a standard datasheet). This also shows how the quantity and quality of litter has changed over time when the data has been collected frequently.

The data allows users to identify the major marine debris issues, track where items are coming from, and to create source reduction plans. Source reduction plans are solutions that are tailored to certain issues in specific areas.

The database is managed by not-for profit organisation Tangaroa Blue Foundation. Tangaroa Blue provide support to communities, organisations, agencies and schools including training, clean up materials and logistical support, educational resources and analysis of the debris they find. They provide advice on source reduction plans and have a large network of industry contacts to assist with marine debris related advice.

The database has an open access policy, enabling anyone to enter data and to view a certain sets of data online. There are over 100 000 volunteers and partners contributing to clean ups and data recording. The data is used by a range of entities including volunteer groups, councils, state and Australian governments departments.

A new mobile phone app was launched in June 2018. The AMD App provides a simple platform for users to contribute data from their clean-up activities directly to the AMD Database. Users report that the process is simple and user friendly. The data is uploaded to the database to be accessed directly by those who use it.

The catch phrase of Tangaroa Blue has become 'If all we ever do is clean up, that's all we'll ever do.' There is an increasing appreciation in the community and in government for reliable and up to date data on marine debris which the database provides.

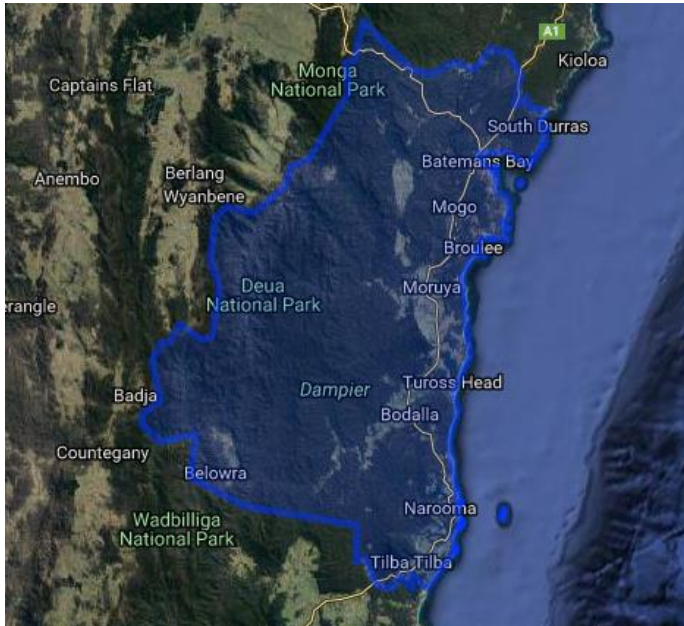
Eurobodalla Shire Council has been contributing and using the database since 2014 and last year was one of the top five Local Government areas to contribute data. The data has shown what the marine debris issues are where resources need to be targeted for improvements.

The database and all association materials can be found at <https://www.tangaroablue.org/database.html> .

## **The Eurobodalla Coast**

From traditional language, Eurobodalla literally translates to land of many waters. With over 110km of coastline, four major river systems and numerous estuaries, lakes and lagoons the name makes perfect sense. The Eurobodalla extends from South Durras in the north to Akolele on the foreshore of Wallaga Lake to the south. The main towns are Batemans Bay Moruya and Narooma. Most of the 38 000 population are located along the coastal fringe, or living beside the lakes and rivers. During the summer months the

population triples with tourists, increasing management pressures in the coastal environment.



**Map 1 – Eurobodalla Shire boundary**

The 110km length of the coastal boundary of our shire means managing the coastal environment is resource intensive. Collecting data on marine debris and litter gives us a better understanding of the different marine debris issues at different sites. The type of marine debris occurring at each site is influenced by a number of factors including the ocean currents, weather conditions, local land use, location of storm water outlets, how those outlets are managed and the aspect of the beach or estuary foreshore.

We can also determine whether the items collected are from local sources or from the sea. In the Eurobodalla, our overall data shows that 75% of collected items are from the land and 25% from the sea. However, if we break that down to individual sites we can fine tune that data and create site specific plans to reduce litter or land based items from entering the marine environment.

Mc Leods Creek in the Clyde Estuary system in Batemans Bay has been monitored since 2015. The data collected here shows the main items are catchment derived (almost 90%).

**Table 1. McLeods Creek – top ten items collected**

	Item	Total
1	Plastic film remnants (bits of plastic bag, wrap etc)	346
2	Plastic packaging food (wrap, packets, containers)	279
3	Foam insulation & packaging (whole and remnants)	109
4	Fishing line in metres (Recreation)	100
5	Straws, confection sticks, cups, plates & cutlery	99
6	Plastic bits & pieces hard & solid	82
7	Aluminium cans	67

8	Plastic bags supermarket, garbage, dog poo, ice	56
9	Glass beer stubbies & pre-mixed alcohol bottles	52
10	Plastic vehicle parts	



**Map 2 – McLeods Creek Map showing proximity to Batemans Bay CBD and large catchment area.**

In contrast, data from Barlings Beach at Tomakin shows that the items collected are mainly derived from the ocean. The main items being broken bits and pieces of hard plastics. These bits of plastic started their time in the ocean as a solid item like a plastic container, bucket or lid and have broken up over time. This is typical of south facing beaches along the east coast of Australia as items are deposited via winds and currents at these sites.

**Table 2. Barlings Beach - top ten items collected**

	Item	Total
1	Plastic bits & pieces hard & solid	2238
2	Cigarette butts & filters	213
3	Lids & tops, pump spray, flow restrictor & similar	175
4	Plastic packaging food (wrap, packets, containers)	164
5	Straws, confection sticks, cups, plates & cutlery	159
6	Rope & net scraps less than 1 metre	98
7	Foam insulation & packaging (whole and remnants)	92
8	Toys, party poppers, ribbons, clips & similar	73
9	Rubber balloons, balls & toys, elastic straps & bands	61
10	Personal care & pharmaceutical packaging	59



**Map 3 – Barlings Beach showing location and aspect**

Volunteer groups are instrumental in assisting to extend clean ups and data recording along the coast and to achieve goals outside of our core local government duties. The Eurobodalla Marine Debris Working group was formed to undertake targeted beach clean ups after storms and high seas and regular beach clean ups at high load areas. The group is overseen by Council's Environment Education Officer.

The group was primarily set up to target plastics in our marine environments. There are many stakeholders and ocean users all with differing opinions on how marine environments should be managed but the one thing all beach/ocean/marine environment users agree on is they don't want plastics in the ocean. The group along with Council's Environment Education Officer promoted clean up events, made them fun to attend and used Community Based Social Marketing technics to 'brand' their efforts with volunteers receiving a free screen print on their favorite shirt. The Education Officer then set about training organisations, community groups and schools in the data collection process.



**Figure 1. I'm part of the solution screen print logo**

## Eurobodalla Marine Debris statistics

The database allows anyone to extract general data based on spatial and date filters. Further detailed information and statistics can be supplied by the database administrator via email. The following is up to date information about Eurobodalla's recorded items since data collection commenced in 2014.

**Table 3. Top 10 Items Eurobodalla 1/01/2014 – 16/10/2018**

	Item	Total
1	Cigarette butts & filters	13030
2	Plastic bits & pieces hard & solid	9046
3	Glass or ceramic broken	3184
4	Plastic packaging food (wrap, packets, containers)	2977
5	Plastic film remnants (bits of plastic bag, wrap etc)	2803
6	Fishing line in metres (Recreation)	2563
7	Foam insulation & packaging (whole and remnants)	1881
8	Paper & cardboard packaging	1818
9	Lids & tops, pump spray, flow restrictor & similar	1511
10	Aluminium cans	1476

Other significant items recorded during this period were plastic drink bottles (1163) and Cyalume glow sticks (186). The majority of the Cyalume glow sticks are identified as those used in the commercial fishing industry.

The statistics were used to highlight to council the litter issues impacting Eurobodalla's waterways. Some of these issues are ones that are similar across the state or country and are being considered at a state or national level of government.

Others are matters for local government and council's response to these issues are outlined in the case studies below.

### Source Reduction Case studies

#### ***Straws, confections sticks, cups, plates and cutlery***

Database records show 1464 items collected from Eurobodalla sites since 2014 with a significant increase in numbers at sites adjoining the CBD of Batemans Bay. The data triggered council to formulate a source reduction plan. The plan included actions to engage both the consumers and the suppliers of single use plastic items.

Council engaged Seaside Scavenge to conduct a clean-up campaign along the Batemans Bay foreshore. Seaside Scavenge is a charity whose aim is to provide multi-faceted options for engagement and education of communities by including clothes

exchanges and live music as drawcards to their events and working with local businesses to improve their plastic use practices.

Their events consist of a foreshore clean up and clothes swap where the litter collected by volunteers becomes the currency to purchase second-hand clothes, toys shoes and other donated items.

In the months leading up to the clean-up event, Seaside Scavenge contacted all waterfront businesses to engage them in reducing single use plastics with an emphasis on straws. Seven waterfront business committed to reducing single use plastics for the day of the event. Some have continued to keep up their efforts in reducing single use plastics available to their customers.

The one day clean-up event was held as part of Council's Plastic Free July events in 2018. 108 people participated in the event. 84% of these had never participated in a clean-up event before. The event resulted in 214.06kg of marine debris and litter collected. Of this 131.06kg was waste and 83kg was recycling. The majority of this was collected from the immediate foreshore, therefore reducing potential marine debris by 131kg in a single clean up event.

The data from this event was logged on the AMDI database and results show that the top items again included straws, soft plastic, cigarette butts, fishing line and metal bottle caps. Regular follow up clean ups in the same area will continue to capture data to assess changes in the items being collected and the impact of education campaigns.

To further engage the wider business community and make behavioural change throughout the community, council is implementing an Environment Protection Authority grant funded project aimed at assisting business to make the switch to using less single use plastics including straws.

The project involves undertaking an audit at the business to look at their current usage of plastics and provides follow-up recommendations on changes that will lead to more sustainable practices within food business. Items that will be targeted include disposable coffee cups, plastic straws, takeaway containers, plastic cutlery and plastic bags.

Council will assist businesses who are keen to make the change by:

- sharing information and tips on minimising disposable products and packaging
- helping businesses find alternative products and price comparisons from local suppliers
- providing stickers to display in businesses to show they are participating in *We Care, Eurobodalla*
- providing signage that you can display to explain to your customers why reducing single-use plastic packaging is important and encourage an appreciation for making sustainable choices.
- The data also allows Council to address some in-house practices targeting high litter areas like our stormwater drains in the CBD areas and using new technologies to capture street litter before it becomes marine debris.

### ***Plastic drink bottles***

1163 whole plastic drink bottles have been recorded in the Eurobodalla at clean-up sites shire since 2014. It should be noted that many drink bottles break down in to smaller

pieces during time in the waterways and these items if unidentifiable are recorded as plastic bits and pieces, 9021 items in the same period.

Council has been working with the Environment Protection Authority and Tangaroa Blue to collect data for the NSW Container Deposit Scheme. Data collection has been undertaken at selected sites in the Clyde Estuary and the Wagonga Estuary to monitor changes in the numbers of containers (glass and plastic drink bottles, aluminium cans and drink cartons) at these sites pre and post the introduction of the NSW Container Deposit Scheme.

The latest data from September 2018 has shown a significant decrease in the number of containers being collected at monitoring sites on the Clyde estuary since the introduction of the Container Deposit Scheme.

Council developed a campaign to reduce the use of disposable plastic water bottles and promote the drinking of tap water. The campaign was labelled *Tap Water Please*. It has involved a range of strategies including installing over 15 water refill stations, distributing reusable bottles in the community and stickers to restaurants and cafes to promote the use of tap water. It also involved two art and photography competitions which generated artwork that has now been displayed on the water refill stations.

### ***Plastic film remnants (Plastic bags)***

2803 pieces of plastic bags and wrap have been collected since 2014. Alarming plastic bag data has come from the Clyde Estuary with one clean up event at Budd Island collecting 58 whole bags in 100m of foreshore.

Council resolved to support the introduction of a plastic bag ban at a state level and promoted the signing of the Ban the Bag petition to the community.

As part of Plastic Free July events throughout the community, council undertook a campaign at local shopping centres called the 'Shopping Trolley Challenge'. This involved engaging with customers to consider how they could reduce the amount of disposable plastic packaging and bags when shopping. Customers were provided with tips to help them and rewarded for participating with reusable shopping and veggie bags, or beeswax wraps.

Through the Moruya Chamber of Commerce, the community of Moruya have initiated a campaign called Bring Your Own Bag. The campaign commenced in Plastic Free July 2018 and has been well publicised and supported by the local businesses, Council and community members.

### ***Balloons***

Balloons are regularly collected by the Marine Debris Working Group. Some of which have been tracked back to their source through logos still present on the trashed pieces of balloon.

In November 2000 the New South Wales Government enacted the *Protection of the Environment Operations Amendment (Balloons) Act 2000*. Since that date it has been illegal to release 20 or more gas-inflated balloons at or about the same time. It is deemed an aggravated offence where a person releases more than 100 balloons. There are a number of exceptions to the offences, for example where the balloons are released for scientific purposes.



The NSW legislation is largely not monitored nor enforced with balloons being released on some commemorative occasions, and community groups or businesses providing balloons as promotional signage or giveaways.

Council has proactively engaged in understanding the issues with balloon releases and raised awareness of the issue in the community through:

- enacting a ban on any balloon releases on council managed lands
- media releases on the adverse effects balloons have on the marine environment and encouraged the use of other ways to celebrate an occasion rather than the release of balloons.
- working with and encouraging local schools to become balloon free zones to assist in spreading the message about the impacts on marine life.
- worked with the local Reverend to liaise with other ministers, clergy and celebrants to help reduce the use of balloons in ceremonial events both in the Eurobodalla and at state level. A letter from Rev. Linda Chapman is displayed on the Tangaroa Blue website to assist other areas to reduce balloon releases. <http://www.tangaroablue.org/amdi/campaigns/61-promotional-balloons/633-reducing-balloon-releases-through-church-networks.html>
- clean-ups with the Eurobodalla Marine Debris Working Group. Data is logged onto the AMDI database to assist Tangaroa Blue and other organisations lobbying at a national level. Balloons found during clean-ups with logos are photographed and sent to Tangaroa Blue who then contact the business to make them aware of the impacts balloons have.
- working with Nature Coast Marine Group at local events to raise awareness of the issues with balloon releases and to seek support and signatures for the group 'no balloon releases'

### ***Foam and cardboard packaging***

An EPA funded project was implemented to engage tradespeople in improved practices with securing their loads on vehicles to reduce the amount of roadside trades waste blown from vehicles. The project used an innovative approach by hosting breakfasts for tradespeople who were then given information about waste reduction in their industry and given free trailer covers and vehicle litter bags for their participation. This method proved successful with high participation and more than 85% reduction in litter at 3 out of 4 hotspot litter sites, 79% increase in the number of registered litter reporters in the Eurobodalla, significant improvements in post-program knowledge survey results.

### ***Cigarette butts and filters***

During 2018 the EPA worked in partnership with councils to develop four Strategies to test which interventions, based on completed research, most effectively reduces cigarette butt litter and littering behaviour.

The four Strategies trialled were:

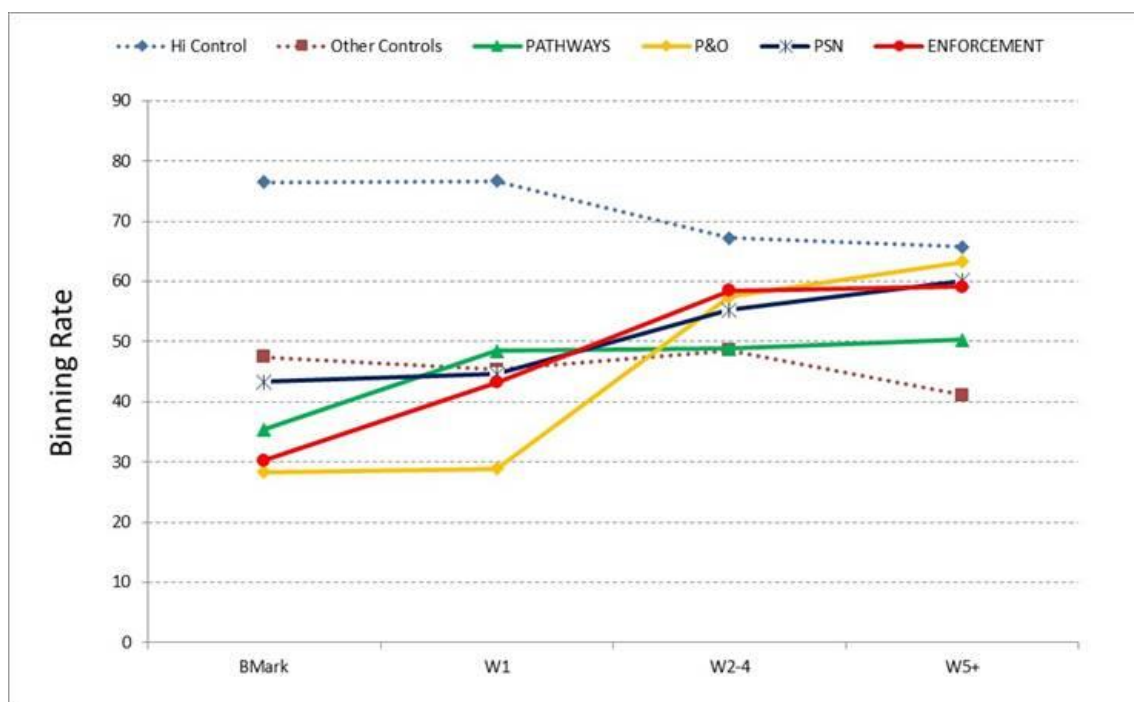
- Pathways – Floor stencils linked to bins stickers that can be used to highlight pathways that smokers can follow to move from where they smoke their cigarette to the location of a suitable bin, and having suitable bins fixed in accessible locations at the site.
- Pride and Ownership - Smokers feel ostracized and not adequately catered for, and this discourages them from responsible behaviour. This strategy involved well

maintained smoking areas with upgraded infrastructure to encourage a sense of ownership and pride in the areas where they smoke.

□ Positive Social Norming - People who perceive a behaviour as the “normal thing to do” are consequently more likely to engage in that behaviour. Activities included installation of signs suggesting bin disposal of butts is then normal thing to do and display of ‘thank you’ stickers on bins.

□ Enforcement - The severity of a penalty appears to be less important for most people than the probability of detection and punishment. Active patrolling and signage displaying that patrolling is active were actions of this strategy.

Eurobodalla results of the trial showed the strategy which had the biggest improvement to butt disposal behaviour was Pride and Ownership.



**Figure 2. Results from trial strategies**

The results show simple improvements to smoking areas and cigarette bins encourage the proper disposal of butts. This information along with data from the AMDI database will allow council to continue to improve their source reduction plans for cigarette butts, the top item collected throughout the shire.

***Education and partnerships***

Eurobodalla’s marine debris initiatives have united and attracted many diverse groups and individuals that may not have worked together before or may not have participated in environmental programs before. This has led to a whole new sector of the community thinking further about other environmental issues and engaging in improved behaviours towards waste minimisation.

The numbers and groups of people involved has been rising steadily since the introduction of the AMDI database to the Eurobodalla. Local partners include the Disability Trust, Hope House (homeless and rehabilitation program), primary schools and

high schools, National Parks and Wildlife Service, Batemans Marine Park, Nature Coast Marine Group, Clean Coast Collective, Young Legends, Seaside Scavenge, oyster growers, local businesses, surf schools, dive clubs, and surf clubs.

Council staff and the Marine Debris Working Group have provided training to these groups who go on to train their members and spread the volunteer base to new sites. The available resources on the Tangaroa Blue AMDI website allow anyone to access the tools and support they need to carry out the clean-ups and data collection.

Along with the active involvement of volunteers in data collection and marine debris clean-ups a shift in attitudes to managing waste and refusing single use items has been evident since increased media promotion, in particular the ABCs War on Waste program that first aired in May 2017.

To tie in with the media surrounding marine debris issues, council's 2018 schools calendar was launched with the theme 'Land and Sea Matter to Me'. The production of the calendar has been running for 20 years and involves all year 4 students from the 11 local primary schools participating in research about the topic and submitting drawings and slogans based on the theme for inclusion in the calendar artwork. The calendar is well loved throughout the community and a common sight in most Eurobodalla homes and schools.



Figure 3. 2018 Schools Environment Calendar

The calendar promotes a different environmental message each year. With the 2019 calendar theme being 'Use Your Voice'. Council has been working with local school students to promote the ways in which young people can make positive environmental change by lobbying the right people in business and government.

Council works closely with schools to support their teachers in delivering high quality and up to date education programs. A Plastic Ocean DVD has been loaned to all schools during 2017 and 2018 where students have viewed the documentary and undertaken further studies on the issues raised.

Recently a year six class undertook a full term of study on marine debris, the teacher incorporating the topic into the curriculum of all subjects including maths, English and art. The class finished the term with students using their newly acquired knowledge to develop solutions to some of the world's marine debris problems. The students developed impressive projects including a bamboo razor to replace throw away plastic razors, a boat with a net and rope system to collect marine debris from the Great Pacific Garbage Patch and drain nets to catch street litter before it enters the waterways.

The education program is changing the attitudes of young people and the community towards waste, in particular plastics, and generating a shift in behaviour where single use plastics are no longer an option for many.

### **Benefits to Council**

The collection and recording of data on marine debris and litter has given Eurobodalla Shire Council a solid foundation from which we can plan further source reduction. We know where our problems lie, can detect new problems quickly and have the data to justify the works needed.

The cost to council is minimal due to the 'train the trainer' approach of engaging volunteer groups and individuals to undertake the works rather than having council undertake ongoing clean-ups. The actual cost equates to a small proportion of the Environmental Education Officers' 15 hours per week.

### **The future**

In the Eurobodalla, ongoing monitoring to ensure the source reduction plans success or otherwise will continue and improvements will be made as new data is collected. Council will continue to implement grant funded projects to assist local businesses, schools and residents with waste reduction and making positive environmental choices.

Some recent project proposals that council is investigating to continue source reduction of marine debris and litter in the Eurobodalla include:

- Introduction of 'Drain Buddies,' collection baskets installed in the Batemans Bay CBD storm water system. The baskets can be easily removed and items counted and recorded.
- Council maintenance teams to record data from Gross Pollutant Trap clean outs on the AMDI database.
- In partnership with a plastic recycling companies, construction of council infrastructure items such as park seating, car stops, fencing cable to be reused by council.

The AMDI clean-up and data collection process is simple and volunteers report that it is interesting to keep track of marine debris items and makes them feel good about being part of the solution.

With minimal resources required, there is scope to increase the volunteer base using the database throughout the NSW coastal environment and we encourage other councils and community groups to get on board to promote the initiative and train others who can undertake regular clean ups. Everything you need to get your community started in collecting and recording marine debris is at the Tangaroa Blue website at <https://www.tangaroablue.org/>.

The more individuals and groups using the AMDI database the more effective local source reduction plans can be and the greater information available for national and state agencies to develop and fund source reduction initiatives.