



**ACHIEVING OPTIMAL
OUTCOMES FOR
AUSTRALIAN
WILDLIFE.**



NSW Wildlife Council Submission to NSW Government Waste and Recovery Strategy

Suzy Nethercott-Watson

Table of Contents

Key Messages	2
The Call to Action from the Impact Statistics of Waste in our Natural Environments	4
Waste within our Natural Environments	5
Impacts of Waste/Plastics on Wildlife	6
Most Common Problem Plastic Waste Items	7
Fishing Line	7
Balloons	8
Plastic Straws or Plastic Rings or Plastic Bottle	10
Photo Gallery of Wildlife Suffering from Waste Entanglements	15
Great ideas for Combatting Waste Some Case Studies	24
Seabin	24
Fishing line bins	25
Corona Becomes First Big Beer Brand to Trial Plastic-Free Rings	28

Key Messages

The NSW Wildlife Council welcomes the invitation to comment as part of the NSW Government development of the new 20year Waste and Recovery Strategy.

Plastics and twine are the major items of concern that have a direct detrimental effect on wildlife but within our submission we discuss and expand on the top ten plastic/waste items wildlife carers find problematic for wildlife.

In the experience of wildlife rescuers regularly called to assist wildlife the 10 most common things that impact our wildlife include:

1. Fishing line or twine
2. Balloons
3. Plastic bags
4. Bottle cap rings
5. Straws
6. Plastic bottles
7. Styrofoam
8. Cling wrap
9. Plastic and foam toys
10. Plastic cutlery

None of the top items are critical to the survival of human life and as such, at a minimum, there needs to be action taken to change the scale of their use and production, and at best phased out completely.

Plastics, a modern day, manmade resource for our convenient and fast paced lifestyle are polymers, chains of molecules produced by smaller molecules called monomers. There are many different types of plastics depending on their molecular make up and shape. Plastics are deeply embedded into our everyday lifestyle to the point that most people would be unaware of the extent to which they make choices which build further demand, for plastic based consumable items. People also remain unaware of the effects plastics and other waste items are having on our wildlife. Single-use plastics includes straws, water bottles, and plastic bags are items, individually, and combining collectively, to direct threaten our native species within NSW, Australia and the world.

A National Geographic publication in 2018, outlined that some 700 species of marine animals have been reported, so far, to have eaten or become entangled in plastic. That's only marine animals... there are countless reports of terrestrial animals being killed, maimed, entangled in or that have ingested plastic items.ⁱ

Statistics collected from the NSW Wildlife rescue groups show the massive scale of animals which have had entanglements from plastics and human waste. These figures are confronting but what needs to be remembered is the scale of the impact will be much much larger than this. These figures only represent the numbers of animals which have been seen and reported. These figures also only represent what would be entanglements

so plastic ingestion and related deaths would not be represented in these figures below.

Number of incidents of wildlife entanglement NSW 2010-2018	
Entanglement_Fishing tackle	2065
Entanglement_Other	11577
Entanglement_unknown	2
Entanglement_Wire/Netting	4647
Grand Total	18291

Wildlife rescuers, rehabilitators and carers in NSW may not yet be able to fully quantify what effect plastic, and twine entanglements, will have long-term on our wildlife. We are regularly seeing the devastating effects firsthand. That is, the deaths and entrapments plastic and waste are having on our wildlife, evidenced through so many of the 180,000 rescue callouts made to the 5000 wildlife first responders within NSW each year. Seabirds and turtles ingesting plastic, whales, dolphins and seals entangled in discarded fishing line and nets, mammals, reptiles and birds with plastic rings or strings caught around their necks, wings, legs or feet. This submission contains a number of confronting images attesting to this fact.



The NSW Wildlife Council understand there is a multitude of policy, program and legislative/regulation initiatives that the Government can adopt. Many of these wildlife/waste encounters can be reduced into the future with some regulated restrictions to manufacturing, a planned matrix of incentives and taxes, a focus on more innovative and efficient recycling solutions and stronger public education/awareness campaigns.

It is up to all of us to play a role to ensure that our wildlife prospers into the future. Our ecosystems are already under considerable stress from habitat loss, urbanisation and climate change. Urgent government action is required to change the cycle of waste and plastic production and leakage into the environment. Such government action should be coupled with extensive community awareness and communication campaigns that can drive grassroots movement as well. You only need to see the outcome from the ABC *War*

On Waste documentaries which has had an immediate, and profound reduction on the offering of plastic straws by hospitality outlets. Grassroots campaigns delivered with information and suggested actions can make a difference. We need to take a stand today before we lose more of our unique and in some cases rare or endangered, native species.

The Call to Action from the Impact Statistics of Waste in our Natural Environments

The outline of the scale of the issue from waste, and in particular plastics, entering into our wildlife ecosystems is an evidence base to drive an urgent focus and attention to actions which will reduce the production, influence consumer use, and drive a wider and more innovative matrix of reuse/recycle actions.

Waste has a significant effect on wildlife and the rate or production and leakage of waste into wildlife habitat has seen the number of species effected grow dramatically.

Waste has not only a direct impact on wildlife but it also degrades the habitat effecting wildlife into the future.

Both the marine and terrestrial environments are greatly impacted by waste and especially plastics.

The fact the NSW Government Waste and Recovery Strategy is being proposed for a 20year timeframe makes the focus on actions and targets for improvement more critical because the scale of impact on wildlife from waste, and in particular plastics, must be addressed within this timeframe if there is any hope to save many species.

The marine environment and birds are most heavily impacted by the scale of plastics in their environment to the point that it could be considered a key threatening process for a number of species over the timeframe of the NSW Government 20 year strategy.

There is an appropriate role for governments to drive a greater corporate focus through awareness, incentives or taxes which will consider the environmental impacts (during production, use and end of life disposal) for the design and packaging of products.



Plastic bag of Organic Carrots. 2x the necessary amount of plastic used in the packaging. (image L. Pratt)

A greater focus on the material which is going to be used, and its impact on the community, and our environment today, and into the future is necessary. Emphasising ecological and recyclable materials (for which there are accepted and supported recycling or reuse programs available) needs to be an included component of the NSW new 20year Government Waste and Recovery Strategy.

There is an urgent need to reduce our production and use of plastics. Change in the short term is necessary in order to protect our marine and terrestrial wildlife.

Waste within our Natural Environments

Globally: Over 8.3 billion tonnes of plastic has been made since its mass production began in the 1950s. Only 9% of this plastic has been recycled, the other 91% sits in landfill, floats in our oceans or has been burned.ⁱⁱ

As shown in the diagram below, the 192 countries with a coast bordering the Atlantic, Pacific and Indian Oceans, and Mediterranean and Black Seas produce and mismanage an estimated 8 million tonnes of plastic which then enters the ocean every year.ⁱⁱⁱ



Source: <https://www.abc.net.au/news/science/2017-02-27/plastic-and-plastic-waste-explained/8301316>

Within Australia we produces nearly 3 million tonnes of plastic a year and less than 12% of this is recycled.^{iv}

Approximately half the plastic Australia produces is only used once and then discarded.^v

Approximately 130,000 tonnes of plastic end up in Australian oceans each year.^{vi}

Every year the waste Australians generate is growing at twice the rate of our population.^{vii}

Australia uses over 10 million plastic bags a day.^{viii}

85% of soft plastics from bags and packaging ends up in landfill.^{ix}

Impacts of Waste/Plastics on Wildlife

Taking these statistics and understanding their impact on wildlife is a necessary analytical step to then choose which would be the best forms of government intervention, to require or influence a change, in the availability of plastics, and their risk of entering our natural environments.

All of the following are facts from Australian Scientists or Australian sources.

Just over a decade ago, the number of marine species known to be impacted by anthropogenic litter was estimated at around 260 species. Now, the number of marine species with reports of fatal entanglement in and ingestion of marine debris has risen to nearly 700, and continues to increase.^x

Many animals mistakenly ingest plastic believing it to be a food source. This can cause injury, suffocation, starvation and often death.^{xi}

One in 10 young flesh-footed shearwater birds – common visitors to Australian coasts – are dying from ingesting plastic or from plastic chemical contamination.^{xii}

Both indirect and direct consequences of wildlife-debris encounters are increasing.^{xiii}

Derelict fishing nets are estimated to have killed upwards of 2,500,000 marine invertebrates, 800,000 fish, and 20,000 marine birds in oceans around the world.^{xiv} The Photo Gallery of Wildlife Suffering from Waste Entanglements included later in this submission shows many local NSW examples where net and plastic entanglements have effected marine animals.

Terrestrial animals are also effected with land turtles being rescued within NSW from plastic ingestion and birds from plastic entanglements.

Plastic waste, in particular, entangles and is ingested by aquatic and terrestrial species which can result in starvation and mortality.^{xv}

Seventeen percent of species affected by plastic waste entanglement and ingestion are listed as threatened or near threatened, and it is estimated by 2050 that 99% of all sea bird species will ingest plastic.^{xvi}

NSW National Parks and Wildlife Service have indicated that between May -September 2019, there were 35 reported whale entanglements off the NSW coast and only a handful of successful rescues. "The rope itself often gets stuck on the animal for a period of time which can cause chronic injuries and chronic illness...It's a very sad fate for most of those whales that are tangled and we can't rescue."^{xvii}

It's not just the plastic debris of itself that is such a major problem, but the plastics transfer hazardous chemicals to aquatic organisms which then functions as a multiple stressor, leading to adverse health effects from the plastic debris and the mixture of chemicals.^{xviii}



Photo Credit: <https://www.abc.net.au/news/science/2017-02-27/plastic-and-plastic-waste-explained/8301316>

Most Common Problem Plastic Waste Items

Experts rated fishing nets and gear, balloons, plastic bags, plastic beverage bottle caps, and plastic utensils as the litter items most harmful to wildlife.^{xix}

“Half of all marine life has been lost in the last 40 years”.^{xx}

In the experience of wildlife rescuers regularly called to assist wildlife the 10 most common things that impact our wildlife include:

1. Fishing line or twine
2. Balloons
3. Plastic bags
4. Bottle cap rings
5. Straws
6. Plastic bottles
7. Styrofoam
8. Cling wrap
9. Plastic and foam toys
10. Plastic cutlery

Fishing Line/Fishing Equipment and Twine

The use of widespread community education campaigns with supporting government programs are likely to have a direct influence on the actions of individuals and businesses and bring about reduced risk of the scale of discarded fishing line entering our natural environments. The NSW Wildlife Council suggests:

- targeting communication and awareness campaigns to Fishing Clubs/Membership Bodies, Bait and Tackle Retail Outlets and Surf Lifesaving Clubs;
- Offering recycle points and receptacles (See the Fishing Line Bin program listed at the end of this submission of a successful grassroots program which is locally making a difference); and
- Include contact information for marine wildlife rescue prominently in all marine/wharf areas.

Little thought is given to snipping fishing line off when it gets tangled in shoreline rocks and trees, or when it becomes snagged on submerged vegetation. The problem you will see in the Photo Gallery of Wildlife Suffering from Waste Entanglements, included in the following pages of this submission shows the wildlife impacts from such simple decisions, made by individuals who are unaware of the deadly consequences of their actions.

Fishing line is by far the most dangerous kind of debris encountered by wildlife. When it is discarded by fisherpersons, it routinely entangles and kills birds, fish, turtles, frogs, small mammals and marine mammals. In addition, the hooks that are attached to the snagged line cause internal bleeding if swallowed. If the hook is embedded in the tongue, which is typical, it prevents the animal from eating, leading to starvation and a slow death.

Both common and protected species of birds are found with fishing line tangled around their legs, wings and beaks. And many have been found hanging upside down in trees, exhausted after hours of struggling to extricate themselves.

The restricted ability of entangled wildlife to move, leads to drowning, starvation, vulnerability to predators, infections and even limb amputation as the animal struggles against the line or embedded hooks.

Monofilament fishing line is not biodegradable. It therefore presents serious environmental hazards for the future. This is one example where phase out legislation would be necessary to have a direct impact on the availability, and hence the risk of fishing line entering our natural environments.

It is not just fishing line though fishing nets are also problematic. “The highest proportion of causes for entanglements with whales is ropes with floats, which is probably associated with fishing equipment that's in use at the time. “Thirty-two of the cases this year in NSW have been ropes and floats.”^{xxi}

Separate to fishing line and derelict fishing equipment the other major entanglement often largely with terrestrial animals is twine/cords. More work needs to be done to understand the extent to which twine is being used in packaging, construction and everyday use items to understand where the items are coming from and how best to include direct actions within the NSW Government 20 year Waste and Recovery strategy.

Balloons

Beach litter surveys have shown the number of balloons and balloon pieces found on the beach have tripled in the past 10 years.^{xxii}

Action to phase out balloons, in the same way governments have legislatively phased out fireworks, should be pursued.

Dolphins, whales, turtles, and many other marine species, as well as terrestrial animals such as tortoises, birds and other animals have all been hurt or killed by balloons. The animal is usually killed from the balloon blocking its digestive tract, leaving them unable to take in any more nutrients which results in a slow death of starvation.

The animals can also become entangled in the balloon and its ribbon making the animal unable to move or eat. Sea turtles are particularly at risk because they naturally prey on jellyfish, which balloons can easily be mistaken for.

Wildlife, both terrestrial and marine, can also become entangled in balloon ribbons or strings, causing injury or death through drowning, suffocation, or an inability to feed and avoid predators.

Balloons can take many years to break down, even the so-called “biodegradable” latex ones.^{xxiii}



Photo: Lance Ferris

Balloons removed from inside Hawksbill sea turtle in August 2011





Three images of balloon debris collected on three different Sydney beaches
photo credits for all L Pratt

Plastic Straws or Plastic Rings or Plastic Bottle

Plastic Straws can't be easily recycled. They are most commonly made from type 5 plastic, or polypropylene.

Whenever there is a beach clean-up, plastic straws never fail to make it on the list of items collected for the day. Straws are currently the 6th most found ocean rubbish item in clean-ups by quantity (July 2019).^{xxiv}



Straw clean up, Manly (Photo Credit C. Leach)

The devastating impact of a straw embedded in the nostril of an Olive Ridley Sea Turtle can be seen in a very confronting video at the following link.

<https://www.youtube.com/watch?v=4wH878t78bw> The appropriate sharing and inclusion of such images as part of a community awareness campaign is likely to be very effective in getting people to change behaviour. The ABC *War on Waste* documentary series has already had a massive impact, reducing the availability of plastic straws at hospitality outlets within NSW and across Australia.



This seagull swallowed something likely a straw and now can't move its head. (Image L. Pratt)

Straws are also dangerous to seabirds, as they can be easily picked up and swallowed, suffocating and choking the bird. In fact, over 1 million seabirds die each year from ingesting plastic.^{xxv}

To make matters worse, if an animal eats too much plastic, it can starve to death. Once plastic is swallowed, it can't be digested and gets stuck in the stomach of the animal. In other words, plastic can fill up the stomach of a marine animal, preventing it from eating any actual food. The animal will then slowly starve to death.



Rubbish collected from a short stroll on the beach. Image credit L Pratt

Discarded fishing bags around fishing water ways have been found in marine turtle's stomachs. Within the last months in a small area within the Hunter Valley Wildlife Rescue group area there has been:

- 11 sea turtles with plastic rubbish (unfortunately this causes the turtles to become what is known as 'floaters' where they are unable to dive, and as a result tragically are now not only starving but also become a high risk to be hit by passing boats); and
- 5 land turtles with discarded plastic fishing bags found within creeks where people fish.

Wildlife rescue groups have rescued many birds that have come into care as a result of ingestion of plastics or plastic rings around neck. This is not only a marine issue as territorial species such as magpies have also needed to be rescued, and assisted with plastic twine and ring entanglement.

Like straws and fishing line, plastic bottles are not biodegradable. Plastic cannot be recycled by living organisms. Instead, a combination of the sun's energy and environmental factors like rain will continue to degrade plastic down into smaller and smaller pieces. Unfortunately, these pieces of plastic become microplastics and will always remain on Earth as plastic.

When plastic degrades, toxic chemicals in the plastic are released into the environment. Any plastic that makes it into the environment will stay in the environment, forever harming wildlife into the future.

Once plastic is ingested by a living organism, it can move up along the food chain. When predators eat prey with plastic in their systems, the plastic gets passed along into the next animal in that food chain.

Plastic swamp in our backyard after high tide. Image L.Pratt





The break down of plastics into micro plastics (*image L. Pratt, Cronulla*)



(*image L. Pratt*)

Plastic ring pulls are a hazard to the feet and heads of birds, fish, marine and land based mammals.

Efforts by NSW Wildlife Rescue Groups to raise public awareness of the risks and impacts to wildlife from plastics and waste. The following photo shows waste collected in 15mins from a Sydney beach.



Photo Credit L. Pratt



Wildlife walk amongst our rubbish... bottle caps and small rubbish pieces are easily to pick up by our birds (Photo credit L. Pratt)

Photo Gallery of Wildlife Suffering from Waste Entanglements
(images unless indicated are from NSW Wildlife Council Member rescue groups)



Photo Credit Maryanne Gates

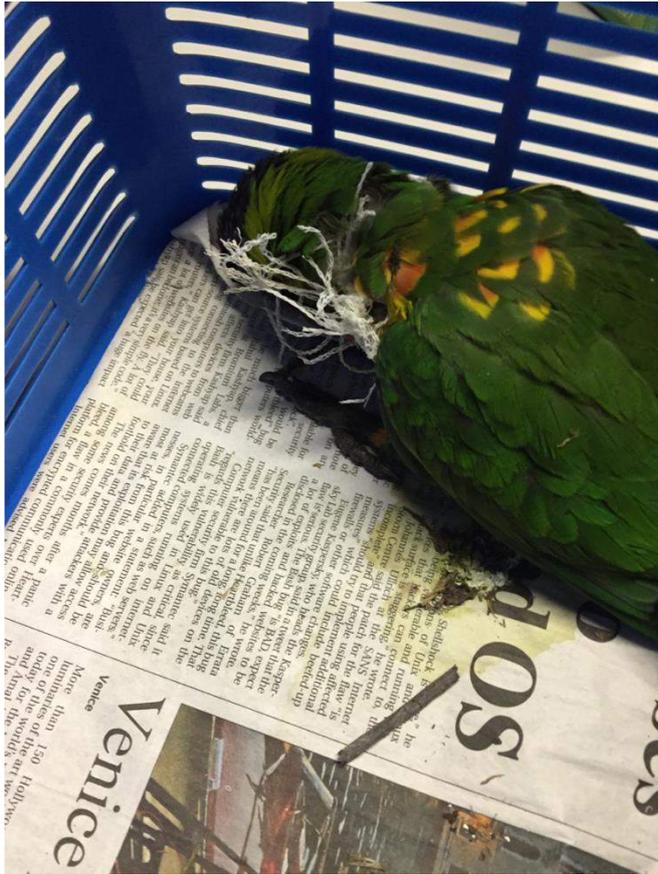


Photo Credit Maryanne Gates



Whale entanglement of NSW, whale dragging ropes behind it. Photo Credit ORCCA



Whale entanglement of NSW Photo Credit ORCCA

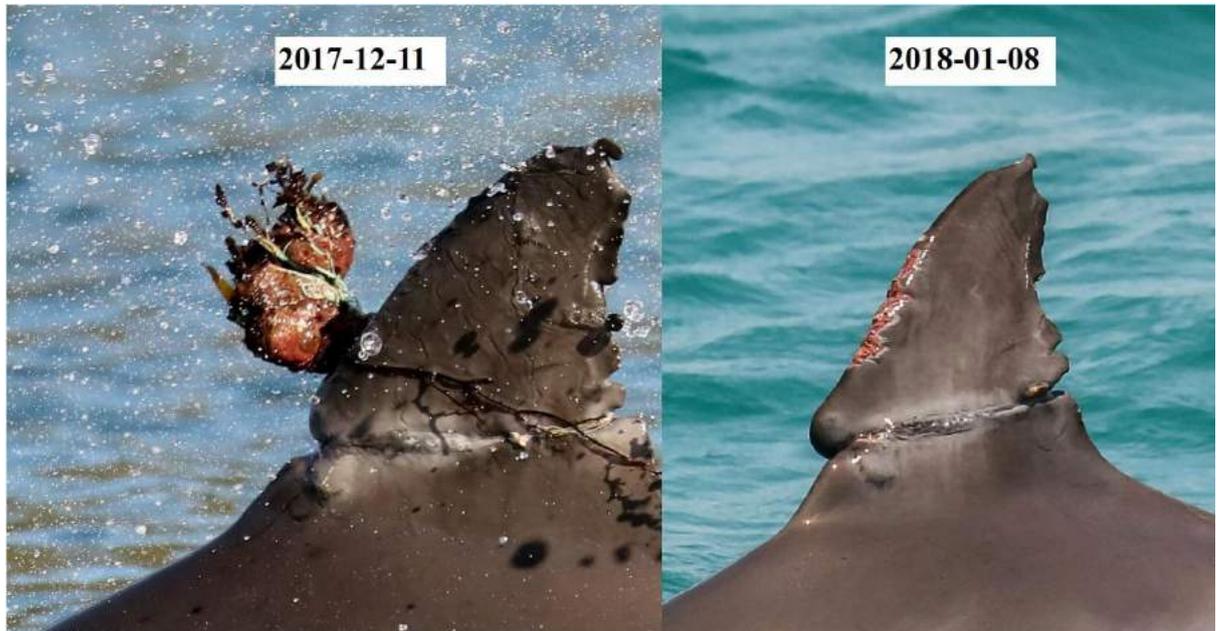


Whale entanglement of NSW, it has a lice condition now as it can't swim efficiently.
Photo Credit ORCCA



Photo Credit Tweed Valley Wildlife Carers





Three photos showing fishing line cutting into the dorsal fin of this dolphin over a long period of time. Photo Credit ORCCA



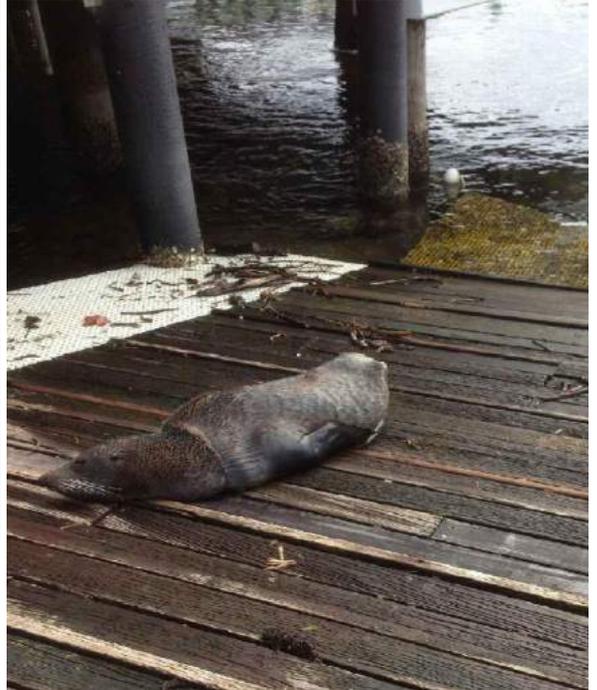
Discarded fishing line wrapped around the dolphin's dorsal fin. Photo Credit ORCCA



Dolphin caught and entangled in mooring lines. Photo Credit ORCCA



Fishing line wrapped around this seal. From its mouth, down to its chest and around its tail flippers. Photo Credit ORCCA



This fur seal, which was in Sydney Harbour, had plastic around its neck. It was later euthanised due to its poor condition. Photo Credit ORCCA



Entangled whale off NSW 20.09.19. Photo Credit NSW National Parks and Wildlife Service (NPWS)



Photo Credit NPWS



Twine caught around the leg of a wombat. Photo Credit Bek Quinn

Great ideas for Combatting Waste - Some Case Studies

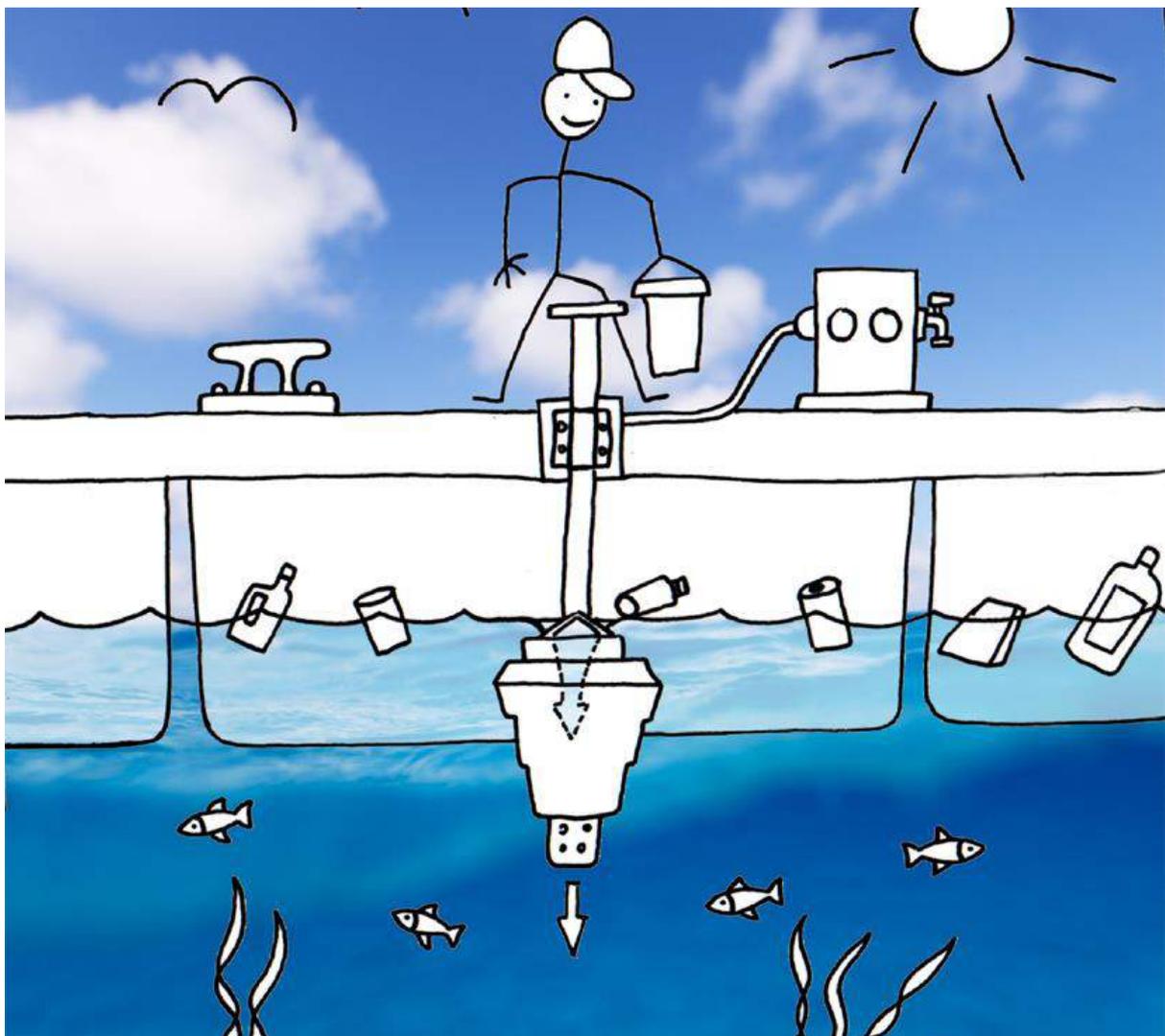
Seabin

<https://seabinproject.com/>

THE SEABIN MOVES UP AND DOWN WITH THE RANGE OF TIDE COLLECTING ALL FLOATING RUBBISH...

Water is sucked in from the surface and passes through a catch bag inside the Seabin, with a submersible water pump capable of displacing 25.000 Lph (liters per hour), plugged directly into either a 110V or 220V outlet. The water is then pumped back into the marina leaving litter and debris trapped in the catch bag.

The Seabin can catch an estimated 3.9 Kgs of floating debris per day or 1.4 tons per year (depending on weather and debris volumes) including micro plastics down to 2 mm small.



Fishing line bins

A fantastic Australian initiative. A high school student, Josh Carpenter, designed a fishing line bin aimed at saving marine life from getting entangled in debris.

The project was funded by the NSW Fisheries Department under the auspices of Tweed Valley Wildlife Carers Group.

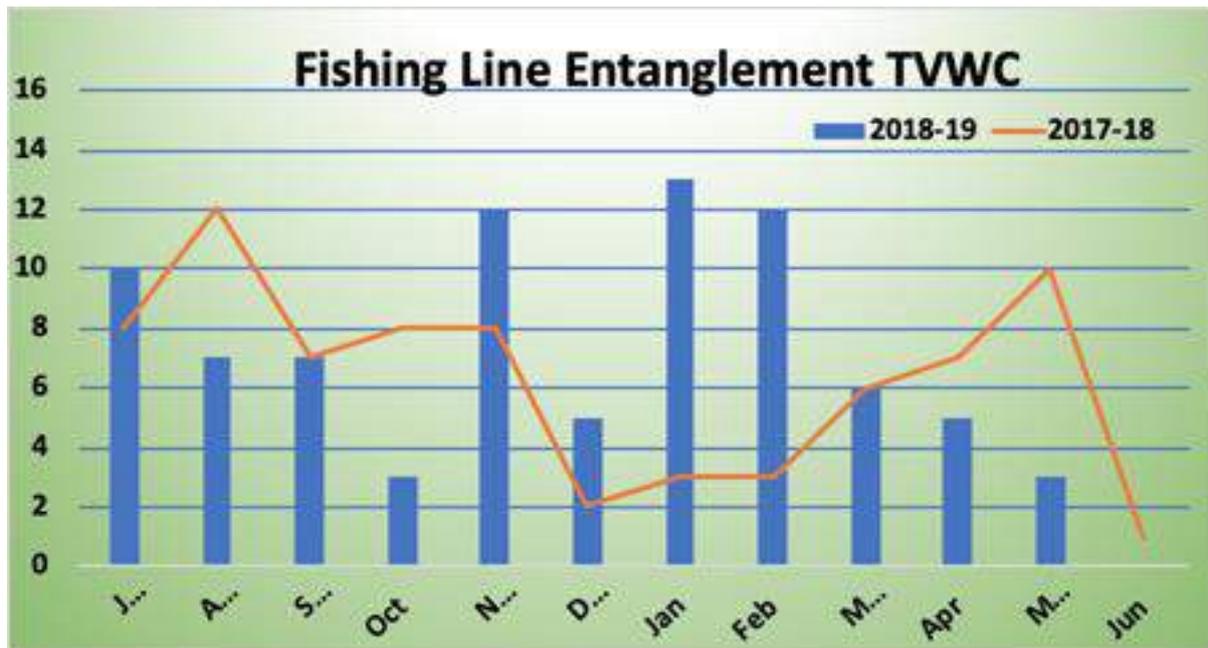
The project consisted of placing especially designed bins at 12 venues around the shire and advertising the project by producing a brochure which included the tide time data for the next months and placing them at local fishing tackle and bait suppliers.

It has since been installed in 13 popular fishing spots down south, and Josh and two volunteers have been emptying the bins of fishing line, hooks and sinkers weekly over the past 12 months. One bin alone collected over 24km of line and 10kg of lead weight.



Made from recycled plastics, the bins also contain messaging to help promote responsible disposal of fishing materials and advice for what to do if someone sees injured wildlife. A 2013 study of coast users found that 56% of those who came across a *Seal the Loop* bin changed their waste disposal behaviours as a result.





The incidence of Fishing Line Entanglement rescues has declined (blue columns) since the bins have been installed and monitored.

Description of Activities

Bin production, bin design and installation of 10 debris bins.

Printed 5000 copies Tide Times Tweed River NSW April 2019 – March 2019

Brochures with stands delivered to fishing tackle businesses, fishing clubs, and fishing bait/general stores. Brochures will be replenished as required.

Working with auspice agency Tweed Valley Wildlife Carers Inc., volunteers are responsible for emptying and maintaining bins. Volunteers use mobile phone app Airtable to record debris collected.

Data uploaded to Tangaroa Blue Foundation Data Collection Base for the Australian Marine Debris Database.

Each volunteer issued a Training Manual, Risk Assessment and cleaning kit.

Debris collected for the period 26 March – 11 April 2019 Bait Bags – 65

Sinkers – 15

Hooks – 31

Fishing Line – 231 cm

Other (Lures/Float/Swivels) – 4

A recent post by Tweed Shire Council about the project was picked up internationally and was the most successful post they have ever had.

Post Details

Tweed Shire Council
Published by Steve Tilman · 171 · August 18 at 7:52 AM · 🌐

SUSTAINABILITY SUNDAY 🌱🌊

After seeing the damage that discarded fishing line and tackle has caused to marine wildlife, Joshua Carpenter, a Year 12 student at Banora Point High School, designed a tackle debris bin made from recycled PVC pipe and installed three bins at popular fishing sites.

Over a 12 month period, Josh and two volunteers emptied the three bins of discarded fishing line, hooks, sinkers and other debris on a weekly basis collecting over 24km of fishing line an... See More



Performance for Your Post

177,932 People Reached

11,309 Reactions, Comments & Shares 🗨️

8,121 Like	2,528 On Post	5,593 On Shares
1,186 Love	456 On Post	730 On Shares
6 Haha	3 On Post	3 On Shares
116 Wow	64 On Post	52 On Shares
2 Sad	0 On Post	2 On Shares
2 Angry	1 On Post	1 On Shares
790 Comments	348 On Post	442 On Shares
1,133 Shares	1,066 On Post	67 On Shares

21,596 Post Clicks

2,115 Photo Views	24 Link Clicks	19,457 Other Clicks 🗨️
----------------------	-------------------	---------------------------

NEGATIVE FEEDBACK

30 Hide Post 11 Hide All Posts

0 Report as Spam 0 Unlike Page

Reported stats may be delayed from what appears on posts.

👍 Get More Likes, Comments and Shares
When you boost this post, you'll show it to more people.

177,932 People Reached	32,905 Engagements	Boost Post
---------------------------	-----------------------	----------------------------

👍👍👍 Wendy Bright, Lexie Zauner and 3K others · 315 Comments 1,066 Shares

Information Sourced from :

https://www.facebook.com/abcinbrisbane/?tn-str=k*F&hc_location=group_dialog

<https://www.zoo.org.au/seal-the-loop/>

and information provided by Jan Pilgrim President of the Tweed Valley Wildlife Carers

Evidence of Manufacturers Implementing Changes to Production to Lessen the Plastic Issue

Corona Becomes First Big Beer Brand to Trial Plastic-Free Rings

Source: <https://www.ecowatch.com/corona-biodegradable-beer-rings-2622389922.html>



Corona / Business Wire

Corona will pilot 100 percent **plastic-free** six pack rings in select markets—the first global **beerbrand** to attempt the switch after **moves from smaller beer companies**.

The plant-based rings will be piloted in Tulum, Mexico—Corona's homeland—at the beginning of 2019.

"The beach is an important part of Corona's DNA and we have been working with Parley to address the issue on the frontlines where plastic is physically accumulating," Corona Better World Director Evan Ellman said in the press release. "We also recognize the influence a global brand like Corona can have on the industry, and with the support of Parley, are pursuing scalable solutions like plastic-free six pack rings that can become a new standard to avoid plastic for good."

Corona is testing its rings made from "plant-based biodegradable fibers, with a mix of by-product waste and compostable materials," the press release said. If littered, "they break down into organic material that is not harmful to wildlife."

The Final Word
 from the NSW Wildlife Council Submission
 to the NSW Government on the Waste and Recovery 20year Strategy

We repeat the confronting statistics that tell only a fraction of the impact of plastics/waste on wildlife.

Remembering the actual scale of the impact will be much much larger than this. These figures only represent the numbers of animals which have been seen and reported.

These figures also only represent what would be entanglements so plastic ingestion and related deaths would not be represented in these figures below.

Number of incidents of wildlife entanglement NSW 2010-2018	
Entanglement_Fishing tackle	2065
Entanglement_Other	11577
Entanglement_unknown	2
Entanglement_Wire/Netting	4647
Grand Total	18291



Questacon wall art. (Photo Credit L. Pratt)

End Notes

ⁱ (<https://www.nationalgeographic.com/magazine/2018/06/plastic-planet-animals-wildlife-impact-waste-pollution/>)

ⁱⁱ www.take3.org

ⁱⁱⁱ <https://www.soshire.org/why-plastic-is-a-problem>

^{iv} ibid soshire

^v ibid soshire

^{vi} ibid soshire

^{vii} Stats from Episode 1 and 2 of the ABC War on Waste show

<http://education.abc.net.au/newsandarticles/blog/-/b/2913159/how-your-school-can-join-the-war-on-waste>

^{viii} ibid ABC War on Waste

^{ix} ibid ABC War on Waste

^x ibid Hardesty

^{xi} www.take3.org

^{xii} <https://www.theguardian.com/environment/2016/feb/18/billions-of-bits-of-plastic-waste-threaten-humans-and-wildlife-senators-told>

^{xiii} Hardesty, B.D, Good.T, Wilcox, C “Novel methods, new results and science-based solutions to tackle marine debris impacts on wildlife” *Ocean & Coastal Management* 115 (2015) 4-9

^{xiv} ibid Hardesty et al

^{xv} Willis.K, Maureaud.C, Wilcox.C, Hardesty. B.D “How successful are waste abatement campaigns and government policies at reducing plastic waste into the marine environment?” *Marine Policy* 96 (2018) 243-249

^{xvi} ibid Willis et al

^{xvii} <https://www.abc.net.au/news/2019-09-11/whale-entanglements-in-nsw-hit-new-record-prompting-mitigation/11501772>

^{xviii} Hardesty, B.D, Good.T, Wilcox, C “Novel methods, new results and science-based solutions to tackle marine debris impacts on wildlife” *Ocean & Coastal Management* 115 (2015) 4-9

^{xix} ibid Hardesty et al

^{xx} <https://bluethethefilm.org/>

^{xxi} <https://www.abc.net.au/news/2019-09-11/whale-entanglements-in-nsw-hit-new-record-prompting-mitigation/11501772>

^{xxii} <https://balloonsblow.org/>

^{xxv} <http://adsabs.harvard.edu/abs/2016AGUOSHI44A1834R>