CSIRO OCEANS & ATMOSPHERE

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Handbook of Survey Methodology

Plastics Leakage

(developed for CSIRO Global Plastic Pollution Baseline Project)

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Important disclaimer

Contents

1 Overview and relevance

Marine debris has been identified as a significant risk to biodiversity, economies, human health, fisheries management, tourism and invasive species transport.

Most marine debris, with estimates up to 80% or more, comes from land-based sources. Surveying litter along coastal areas is an important and low-cost way to build a dataset that can enable long-term assessment and monitoring of marine debris. However, because most waste that is lost into the marine environment comes from land-based sources, we are better poised to understand where, why and when waste is leaked into the environment when we have information from across the landscape (rather than only in coastal areas). Hence, this global project focuses not only at the coast, but in upland and riverine areas. To understand the breadth of losses to the marine environment, we will also quantify floating plastics in the nearshore environment.

Objective

We are using field sampling to measure, and mathematical modelling to estimate, the distribution and movement of plastic waste near urban centres, along waterways, on the coastline and in the ocean.

Outputs

We are designing robust sampling plans tailored for each country involved. These plans can be adapted for other participating countries. These data will comprise a comprehensive dataset of plastics on land, along rivers, at the coastal interface, and in the ocean for major coastal cities around the world. We will use these data with statistical models to produce maps that highlight the plumes of plastic emerging from urban centres and nearby areas. We will then estimate the amount of plastic from the plumes that is lost to the open ocean or redeposited back to land.

Outcomes

This project will provide a clear linkage between land-based waste management and losses of waste into the marine environment.

We are engaging and training local partner institutions.

We are building capacity to help people from participating countries be able to improve their analytical skills in terms of measuring, analysing, and mapping plastic pollution.

Learnings from the project can serve as a basis for advocacy to drive social pressure for investment in infrastructure and regulation for waste handling.

Our results will also be used to engage with industry regarding best-practices.

We are also identifying opportunities for waste management and valuing plastic to reduce poverty and create alternative livelihoods.

Methods

This Handbook provides detail on the various survey methodologies used by CSIRO's team that focus on plastic pollution on land and at sea – in upland, riverine, coastal and marine environments. We invite you to follow our methodologies in order to develop consistent, robust datasets across various geographies that can be used in understanding waste or debris flows from land to the ocean.

Survey methods

This handbook covers methodology for conducting surveys in four different areas:

- Inland Areas: 3-6 transects that are 25m^2 in area (either 2m x 12.5m or 1m x 25m), conducted in the primary land use types at the survey area.
- Riverine Areas: 3-6 transects that run from the water's edge to 2m beyond the influence of the river, and are 2m wide.
- Coastal Areas: 3-6 transects that run from the water's edge at the coastline to the vegetation near the coast, and are 2m wide.
- At-sea in the nearshore – through Surface Trawl Surveys: Three 15-minute tows conducted from a vessel or boat in nearshore areas.

The three types of terrestrial surveys; Inland, River, and Coastal transects, are all very similar in nature. While there are slight differences between the data collected at each site, the basic methodology is the same. We have provided a single description of each of these three survey approaches that incorporates key information unique to each type of survey area (see p. 12). For each of these three survey areas, we carry out transects to estimate the amounts and types of litter or waste we find in these environments.

The fourth compartment we survey is the surface of the ocean in nearshore environments. At-sea trawl surveys are very different to the terrestrial surveys. They require a boat or vessel, and a specialised floating trawl net. Methods for carrying out surface trawl surveys are provided separately on page 22.

Conducting clean-ups to be included in data collection for this global project

We encourage participants to combine the data collection with a clean-up. If your group would like to conduct a clean-up and record/report your findings, please refer to the methods in Appendix B on page 40.

2 Important tips and instructions

Please read this section carefully before you begin collecting data. You will find advice on the following topics:

1. Site selection and choosing survey locations within the site;
2. Collecting size class data;
3. How to sub-sample if your survey area has too much debris to accurately count it all;
4. Notes to remember prior to collecting your data.

2.1 Site selection

CSIRO staff will work closely with you and your team to identify exact survey sites. Please do not undertake this activity without our input. YOU (and your team) identify the city and/or river of interest and we will work with you to select the actual survey sites for all 4 survey types.

If you would like to add a new area or change any of your sites, please let us know well in advance of field sampling, as the sites that have been chosen for your project have been carefully selected based on random stratified sampling. This ensures that the data cover a wide range of site types, and that all possible site types are accounted for (for instance varying population densities, proximity to roads and waterways, and land use types). If you are intending on conducting surveys outside of the sites that have been selected by CSIRO, please ensure that they are selected at random, and not on the basis of already existing debris accumulation points. If you find that your sites selected by CSIRO either have such high amounts of debris that they are too difficult to sample easily, or conversely have almost no debris, we can assist with adaptive sampling to address these issues.

What if I can't access the site?

If you can't reach the GPS point for any reason (e.g. it is inaccessible by road, the vegetation is too dense, or it is in a dangerous area), sample as close as you reasonably can to the GPS coordinates. Keep in mind to select as randomly as possible (e.g. throw a rock, stick, or stake over your shoulder and sample at that location) – don't look for the area with the most amount of trash to carry out your transect – this would bias the data and is not what we want.

How many transects should I conduct?

Whether you are conducting river surveys, inland surveys, or coastal surveys, you will start with a **minimum of three transects** at your site. If you finish all three transects and have not yet found a single item of debris on **any** of the transects, add another one. Keep adding transects either until you have found at least one item, or you have completed six transects, whichever comes first.

How will I count it all?

Remember that the goal of this project is to gain an accurate representation of the debris loads in the environment. While some (most likely tiny pieces of) debris, waste or litter may be missed, the goal is to cord and report the best data possible, though we acknowledge that sometimes people may miss small bits of debris. We all treat this topic specifically under the 'subsampling' section (2.3).

Choosing transect locations at a site

Where should you conduct these transects? The answer varies depending on the type of transect you are conducting.

Coastal Transects

First, have a look at the environment around you. If it is all very similar, all of your transects can be placed anywhere within the area, taking into account minimum distances from access points (50m) and between transects (50m) (see Points to Note, p.10). If there are several different habitats or land use types at your site, divide your three transects proportionally between site types.

For example, a coastal site may contain some sandy beach areas and some rocky slab zones (Figure 2.1). Since more of the beach is sandy, run two transects in the sandy area, and one in the rocky part.

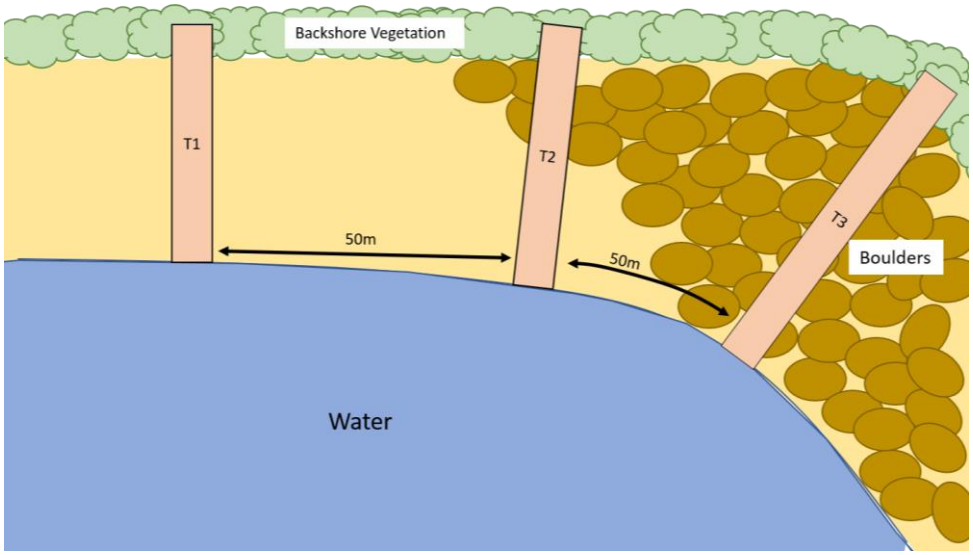


Figure 2.1 Example of how to lay out three transects in a coastal area.

River transects

The first river transect should be conducted at least 50m from the access point. Each subsequent transect should be at least 50m apart.

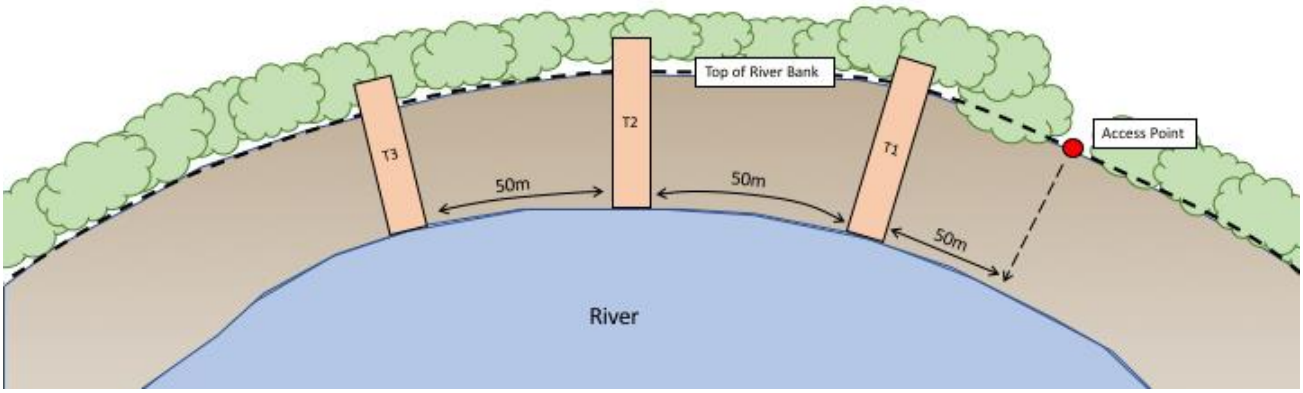


Figure 2.2 Example of how to lay out three transects in a river survey

Inland transects

The **Inland Transect Data** sheets specify a variety of land use types, including car parks, roadways, schools, etc. Immediately below you can see what this looks like on the data sheet:

Type of survey:	Walkway Car park Roadway School Public transport Drain Natural Veg. Wetland Park Disused Ag/ pasture Ag/ cultivated Other (specify):	*Circle the best option to describe the type of land use of the survey area*

In the example below, you would complete one transect in the park (2m x 12.5m), one along the walkway (2m x 12.5m), and one along the edge of the road (1m x 25m).

If you have to add transects beyond the first three because you have found no debris, please add them first in any land-use types that you have not yet surveyed, and then add any remaining transects proportional to habitat types within the area. In the example below, you would add a fourth transect of 2m x 12.5m around the bus shelter ("Public Transport" land-use), a fifth in the park, and a sixth along the walkway.

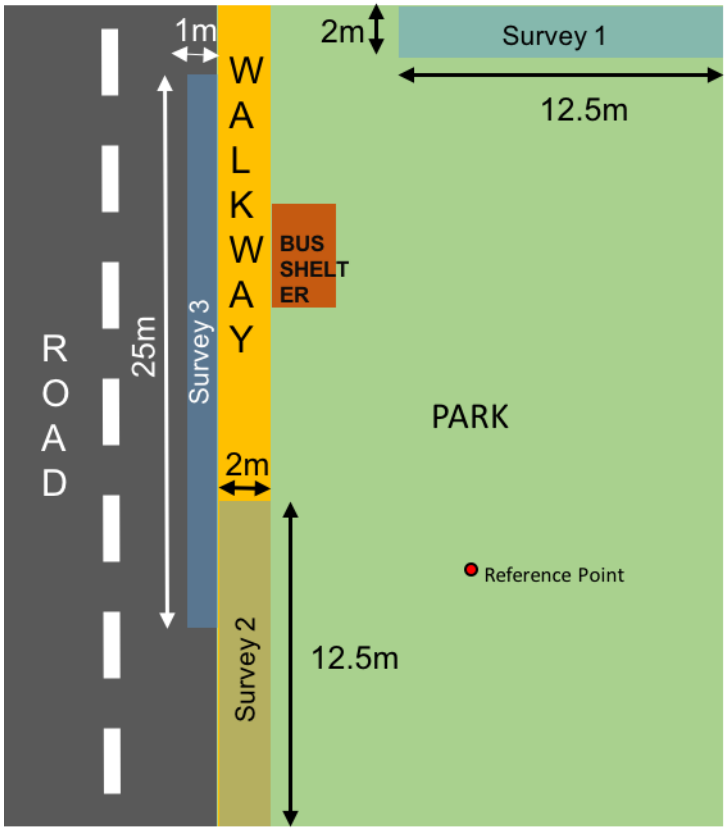


Figure 2.3 Example of an inland survey across different land use types

If in doubt of how to distribute transects,

Figure 2.4 provides a useful flow chart to help when determining where to locate transects within a site.

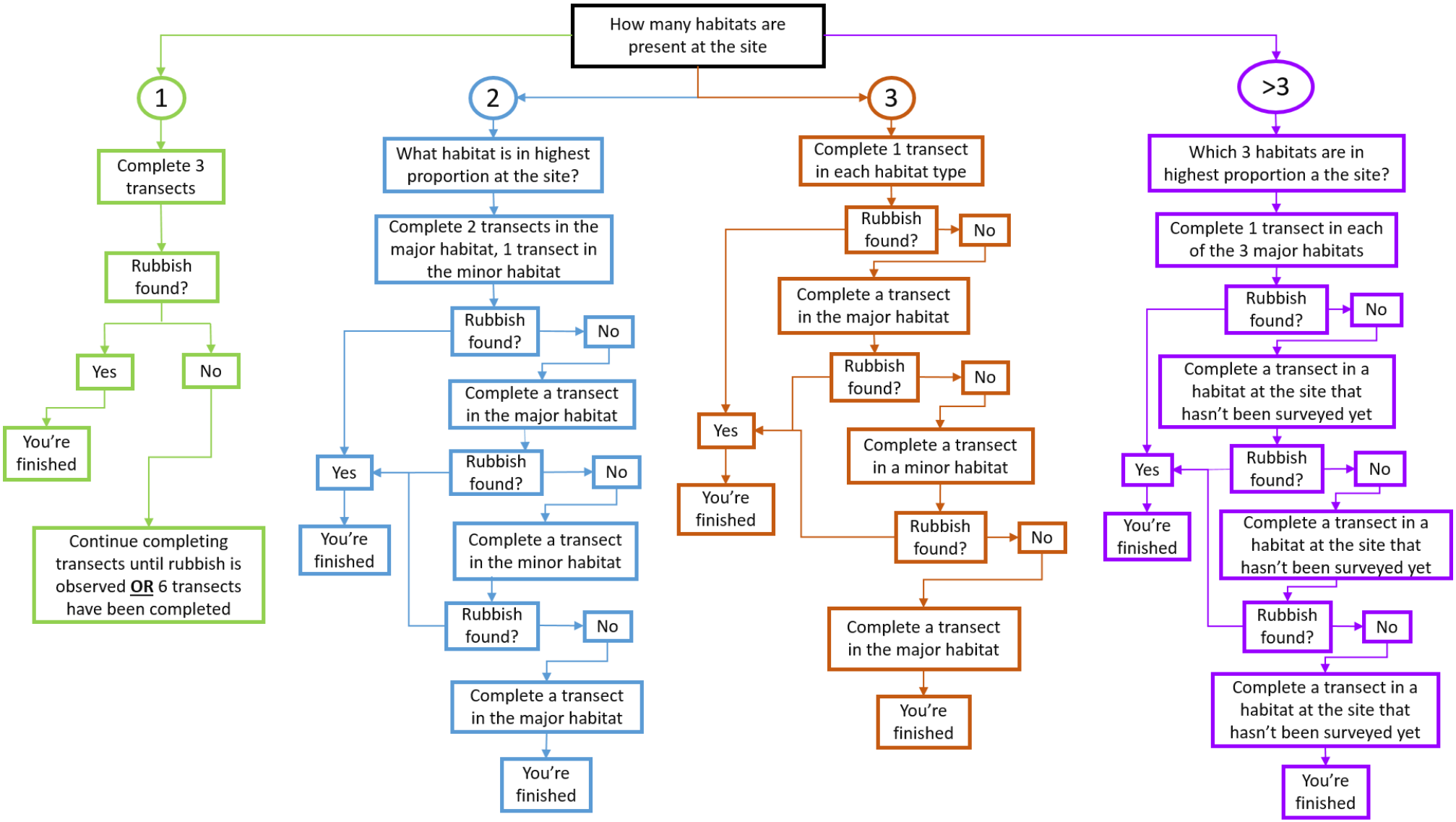


Figure 2.4. Decision tree to aid in figuring out where to place transects at your site location.

2.2 Size Class

To understand the way debris moves around different environments we collect information on the size of some of the debris we encounter. Because it would be too time consuming (and it is not necessary), we only record the size class of a maximum of 10 items on each transect, rather than recording the size of every single item we find. We record a size class for up to ten of the items found in each transect. The following technique will ensure that the data are collected as we require. In short, we want to record the size of a few items across the entire transect length. This is not relevant for surface trawl sampling.

Size class methods for transects

1. Divide the total length of the transect by 10. This will give you equal intervals to collect size class data. E.g. If the total length of your transect is 26m, interval lengths will be 2.6m each. Record the total length on the **Items** List datasheet in the box labelled "Interval start (m)" to help you to remember distance intervals.

** **Note: for coastal and river transects,** record transect lengths in whole meters (e.g. 26m, not 26.4m). **

Size class (and sub-sampling intervals)

Interval start (m) 26m	Dist. on tran	ID	Size class
1 0 – 2.6	0.5	G3W	2
2 2.6 - 5.2	2.8	R1W	5
3 5.2 - 7.8	None		
4 7.8 - 10.4	10.3	D5W	1
5 10.4 - 13.0	10.5	D5F	1
6 13.0 - 15.6			
7 15.6 - 18.2			
8 18.2 - 20.8			
9 20.8 - 23.4			
10 23.4 - end			

2. Starting from the distance of zero, record the beginning and end of each interval on the size class table on the **Items List** datasheet. See first column above.
3. For the first piece of debris you find in each interval, record the distance along the transect (to the nearest 1/10 of a meter). See column 2 above.
4. Record the ID of the item (e.g. G1), whether it is whole (W) or fragmented (F) (see column 3 above).
5. Finally, record the size class of that item as per below (column 4).

   NOTE: Record the size class **ONLY** for the **FIRST** item you see in each interval. If there is no debris in an interval, write 0 or N/A in the datasheet for that interval and keep going.
6. Size classes are determined by the longest dimension of the object that will fit within the size class box (see Appendix A, p.38). Size classes start as doubling – e.g. 1cmx1cm; 2cm x 2cm, 4cm x 4cm, 16cm x 16cm.

2.3 Sub-sampling

When you arrive at your site, look closely at the amount of debris in the area. If it is too dense to complete an accurate count, you will have to sub-sample the area. If you think it will take you more than 30 minutes to record all information for the entire transect – SUBSAMPLE – it will make your life simpler!

Figure 2.5 An example of when subsampling would be required

Sub-sampling methods for transect surveys

1. Use the intervals from the Size Class interval that you have written on the **Items List** datasheet. Begin at the start of the transect, 0m. Following the example above, with a total transect length of 26m, each interval will be 2.6m long.

Size class (and sub-sampling intervals)

Interval start (m) 26m	
1	0 – 2.6
2	2.6 - 5.2
3	5.2 - 7.8
4	7.8 - 10.4
5	10.4 - 13.0
6	13.0 - 15.6
7	15.6 - 18.2
8	18.2 - 20.8
9	20.8 - 23.4
10	23.4 - end

2. Choose an appropriate sub-sampling length. The width of the subsample will be the entire width of your transect (e.g. either 1m or 2m). **Choose a sub-sample length** which will divide evenly into the length of the interval. For example, divide the interval length by 2, 5, or 10, depending on the amount of debris present. We will call this value "**X**". Use your best guess, without spending too much time to make that decision! In this example, the transect length is 26m and the interval length is 2.6m. In areas of very concentrated debris, you may select **X** as 10, and have a subsample area of 26cm x 200cm. In areas with slightly less debris, **X** can be 5, and you will survey a larger area, 52cm x 200cm. By selecting a value that divides evenly into the length of the interval, it will make the math easier later on.

3. Record the subsample measurement on the top of the **Transect Data** sheet. Circle Y on the **Transect Data** sheet and the **Items List** datasheet to indicate that you have subsampled the data.

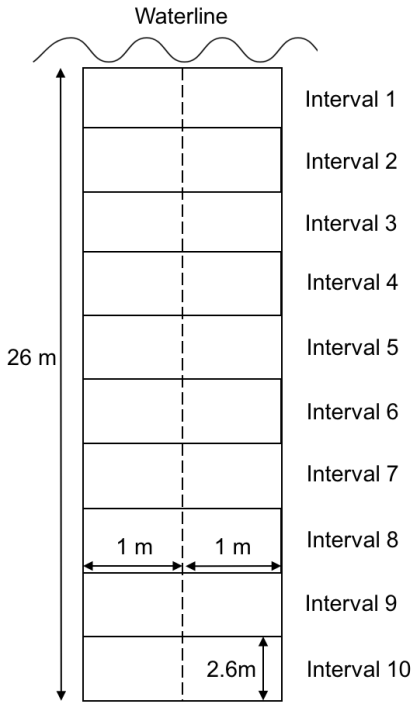
Coastal Transect Data

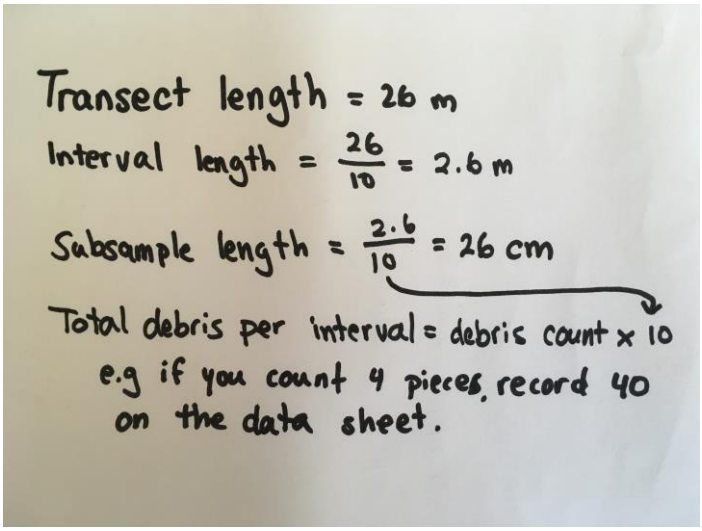
Site Name: Dodges Ferry	Date 26/09/2017	Transect Number: 3 of 3
Transect length (m): 26m	Transect width (m): 2m	Total No. of surveyors: 3
Subsampled? (Y) N	Subsample measurement: 26cm x 200cm	*Dimension of **each** subsample area (e.g. 50cm x 200cm)*

4. At the start of each interval, mark out on the ground the areas you have chosen for subsampling. Within each subsample area, count and the number of each different item of debris found as you would on a standard transect.

   NOTE: Before you record the counts of each item on the data sheet, you will need to multiply the number of items times "X" to yield a total count of what the grand total would have been if you had counted every item along the transect (rather than the total items in the subsample).

   Therefore, you will multiply the number of items of debris by the proportion of the subsample area. For example, if you divided your interval length by 10 to determine your subsample length, you will multiply the number of items by 10. If you divided by 2, you will multiply by 2. In the example above, with an interval length of 2.6m and a subsample length of 26cm, all counts will be multiplied by 10 BEFORE you record them on the **Items List** datasheet.





5. Circle the numbers for each individual subsample (so that it is clear that the numbers are distinct from one another), and repeat for every subsequent subsample. If you run out of room on one datasheet, use another, but make sure to fill in how many pages you have used for that transect on the top of the **Items List** datasheet.

Site ID Code: AH110 **ITEMS LIST** **Page** 1 **of** 2

Date: 16/1/19 ☐ **No debris found** **Transect No.** 2 **of** 3 **Subsampled?** (Y) N

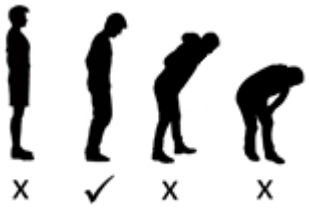
	ITEMS	ID	Fragment	Whole		ITEMS Cont.	ID	Fragment	Whole
Plastic	Pipe/PVC	H1	20		Foam	Food container	D1		
	Beverage bottle <1 L	H2	10 40 60	20 10 50		Cup/plates/bowls	D2		20 30
	Other bottle	H3				Polystyrene	D4		30
	Bottle cap/lid	H4		90 80 40		Unknown/other	D5		
	Food container	H5				Cigarette/butt	P1		

2.4 Before starting transects at any of the sites

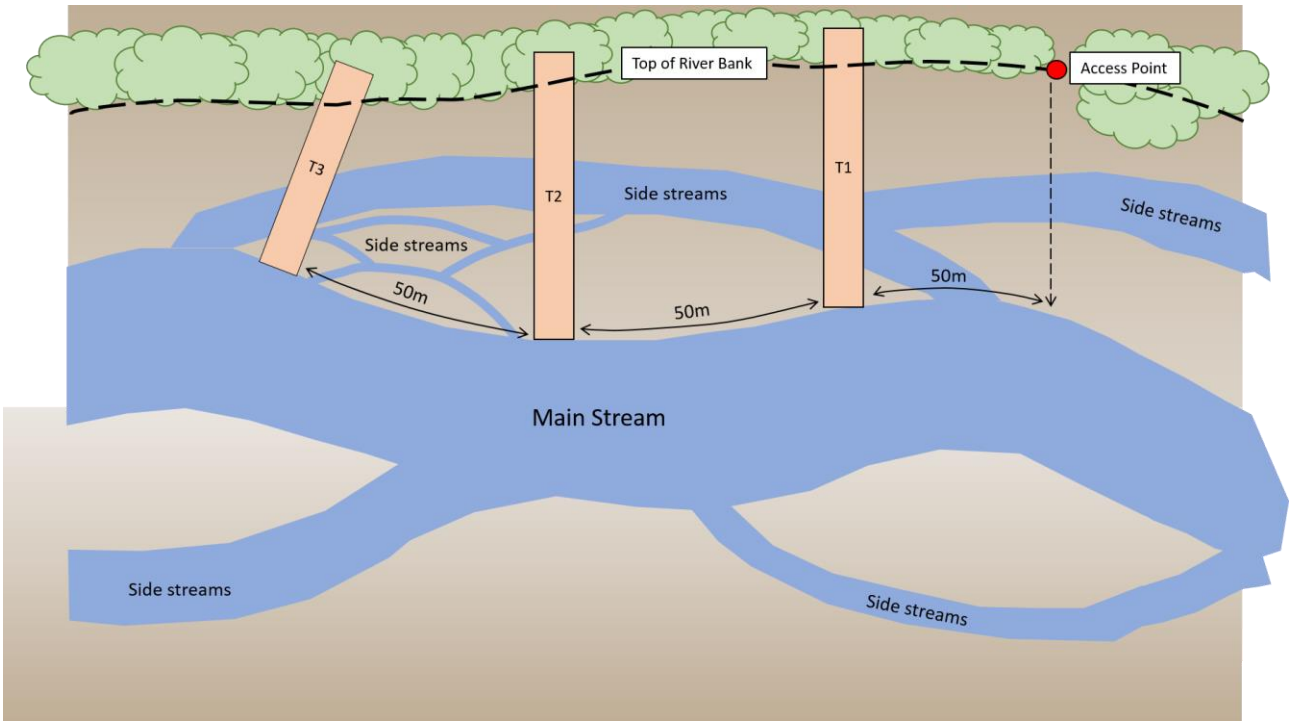
Points to note:

- Before you begin your first transect, have a close look at the area, and determine whether you will need to sub-sample. Sub-sampling methods are used when there is too much debris within the survey area to complete an accurate count (see Sub-Sampling, p. 8). If you are sub-sampling, make sure that you tally the same sized sub-sampling area in each interval. Use additional **Items List** datasheets as necessary.
- Ensure that you complete one **Site Information** sheet per site and at least one **Transect Data/Items List** datasheet for each transect at the site.
- Survey a minimum of three and a maximum of six transects per site.
- Split your transects between the major habitat or land use types (eg: sand, rock slab, boulders, mangroves, park, roadway, vacant lot etc.).
- For coastal and river sites, transects should be located at least 50m from site access point (ideally all should be located on the same side of access point, unless they are in different habitat types). Transects should be 50m away from each other.
- All **Coastal** transects begin at the water's edge and end two metres into the continual terrestrial vegetation (see p. 17).
- All **River** transects begin at the water's edge and end two metres past the influence of the river (see p. 17).
- To ensure standardised data collection, searching should be done from a standing position. When looking for debris, DO NOT bend over. Walk upright and look down with your eyes. Pick up anything you are unsure of for closer inspection, as lots of shells look like plastic and vice versa.

  Note: if you see something you are unsure about, bend down to pick it up, and then decide if it is or is not an item to be reported. But when you are bending down, please do not look for other items to include – wait until you stand upright again!



- All pieces of observable debris within the transect area should be counted. For trawl sample surveys, collect all pieces of debris that are identifiable as non-natural.
- Note that if you find lots of items of one particular category, you can record them in whole numbers instead of ticks, if that saves room or time! E.g. 24 + 2 + 3 instead of ~~IIII~~. Please circle the individual numbers or put plus signs between them, so that it is clear that they are distinct numbers.
- If you find lots of one particular item that is not listed specifically on the data sheet, please add it to the "other" category.
- If you encounter a "braided river" on your **River** transects, run the transect from the edge of the main river to 2m beyond the influence of the outermost side stream. As with other river transects, If you can't tell where the influence of the river ends, go to 2 m beyond the top of the river bank.



3 Standard Transect Methods

3.1 Equipment list

The following is a list of equipment you will need for terrestrial debris surveys. If you are conducting a Surface Trawl Survey, please refer to the equipment list on page 22.

1. GPS (or GPS app on phone)
2. Compass (on phone)
3. Camera (on phone)
4. Wind speed app on phone
5. 1 x 50m Tape measure (can use 25m tape measure for **Inland** transects if desired)
6. 2 markers that you can use to mark points on the ground (such as stakes, sticks, or rocks)
7. One metre long piece of string or rope for each surveyor that can be used to measure width of transect.
8. Pencil to record data
9. Data sheets - one **Site Information** sheet and at least 6 **Transect Data**/**Items List** datasheets for each site visited.

   ** Note it is always a good idea to bring extra **Items List** datasheets in case of subsampling. **
10. Clipboard and rubber bands to keep datasheets in order
11. Gloves (optional), noting you will probably pick up many pieces of litter/rubbish to inspect them.
12. Printout of “Cheat Sheets” and size classes for easy referral.

Setting up your GPS

If you do not have a hand-held GPS, there are a number of useful GPS apps that can be used for your Android or iPhone. Commander Compass Lite is useful in many parts of Asia, and the GPS Status Toolbox has also worked well for people. Please let us know your favourite easy-to-use app so we can share with our networks.

1. Go to the setup page
2. Go to the interface or units page
3. Make sure it is on decimal degrees (dd.dddd) eg 34.96898, 128.567777
4. Datum is WGS84

3.2 Standard Transect Methodology

1. Walk to the GPS location (**inland**) or to where you access the site (**River** and **Coastal**). This may be where you parked the car and can first see the beach/shore/river, it may be the boardwalk where you enter the site. It is often useful to take the first photo here, especially if there is a sign that names the site/beach.

Figure 3.1 Example access points for a river survey (left) and coastal survey (right)

2. Take a GPS reading and record the latitude and longitude under the "Access point location" box and the GPS accuracy on the **Site Information** sheet.
3. Before you move on, fill out the rest of the details on the **Site Information** sheet in the sections SURVEYOR DETAILS and SITE DETAILS.

INLAND SITE INFORMATION

SURVEYOR DETAILS		
Organisation:	CSIRO	*Organisation responsible for survey*
Surveyor name:	John Smith	*Name of data recorder*
Contact number:	+61 234 567 890	*Contact number for data recorder*
Contact email:	John.Smith@csiro.au	*Contact email for data recorder*
Site location:	Latitude: ..... -42.5678° S..... Longitude: .....142..5678° E	*Latitude and longitude of site location (dd.dddd). Ensure GPS is in WGS 84.*
GPS Accuracy	+/- 3m	*Accuracy (metres) of GPS at time of reading*

SITE DETAILS		
Location/Municipality:	Hobart	*Town location of site*
Country:	Australia	*Country in which site was sampled*
Survey date:	16/1/2019	*Date survey undertaken (dd/mm/yyyy)*
Site ID code:	*AHI10*	*Site ID code (provided by CSIRO)*
Site name:	Mawson Place	*Unique name of site*

Photo number/s and name of photographer	P1005, John Smith	*The name of photographer and numbers of photos taken at the site*
Dominant land use:	(Industrial) Residential Commercial/Municipal Natural/Parkland Agricultural Roadway	*Circle best option to describe the dominant land use at the site*
Number of humans:	Time of day (00:00): …… 09:30……. No. of people: …… 4……	*Number of people counted in a 100 x 100m area*
Current weather:	(Clear) Rain/Storm Overcast Drizzle	*Circle best option to describe the weather.*
Wind speed:	0 (1) 2 3 4 5	*0: calm* *1: light breeze (<10km/h , <6 knots)* *2: mod. breeze (10-25km/h, 6-20 kn)* *3: strong breeze (25-49km/h, 21- 26 kn)* *4: high wind (50-65 km/h , 27-35 kn)* *5: gale (65-85 km/h, 35-45 kn)*
Wind direction: *(compass)*	(N) NE E SE S SW W NW N/A	*Direction from which wind is coming measured by the compass. N/A if no wind.*
Date of last clean up:	Street sweeper yesterday (15/1/19)	If known
Access to site:	Paved Unpaved Trail Other (specify):	
Trash cans or rubbish bins present?	(Yes) No	
Cleanliness **at first glance**:	(No debris visible) Scattered debris visible Lots of debris visible Large amounts of dumped debris	
Evidence of dumping? (circle one or more)	None (Construction) Household Other(specify):	
Evidence of recent activities at site: (circle one or more)	None Clean-up or removal of rubbish (Apparent spilled trash or rubbish) (Storm or flood) High winds Public event Mowing	
Comments: Did a clean-up as well at this site.		

4. Look around the area, and decide where you will place your transects.
    a. **Inland** sites: determine how many different land use types you see within 100 metres. If there are several different land use types, divide your three transects between them. If you have more than three land use types, choose the three that are largest in area in your site.
    b. **River** and **Coastal** sites: Determine how many different habitat types you see at your site. If there are several different habitat types, divide your three transects between them.
5. Walk to your first transect location.
    a. **Inland** sites: It doesn't matter which land use type you start in. Pick one and walk to it. Take a GPS reading when you first enter the land use type, and this will be the "Transect start" on the **Inland Transect Data** sheet. If your site reference point is in the middle of a single large land use type, use a random method to select the location of your first transect (for example pick up a stone and throw it over your shoulder or choose a random number and walk that number of steps). Put in one of your transect markers here. This is the 'Transect Start' for Transect 1 on the **Inland Survey Data** sheet.

b. **River** and **Coastal** sites: Choose a direction and walk 50m away from the access point. it doesn't matter if you go to the left or right of the access point for transects, but ideally choose one side. In small areas you may have to run transects on both sides of the access point. Once you are 50m from the access point, use a random method to select the location of the first transect (for example pick up a stone and throw it over your shoulder or choose a random number and walk that number of steps along the river). Put in one of your transect markers here at the river's edge. If you cannot access the river at 50m due to vegetation or for safety reasons, please walk **further** (i.e. walk 70 or 100m if necessary) to start your first survey. This is the 'Transect Start' for transect 1 on your **Transect Data** sheet.

6. Fill in as much of the Transect Data sheet as you can BEFORE you begin to collect data on your first transect. Be sure to record the name of the data recorder at the bottom of the page.

Inland Transect Data

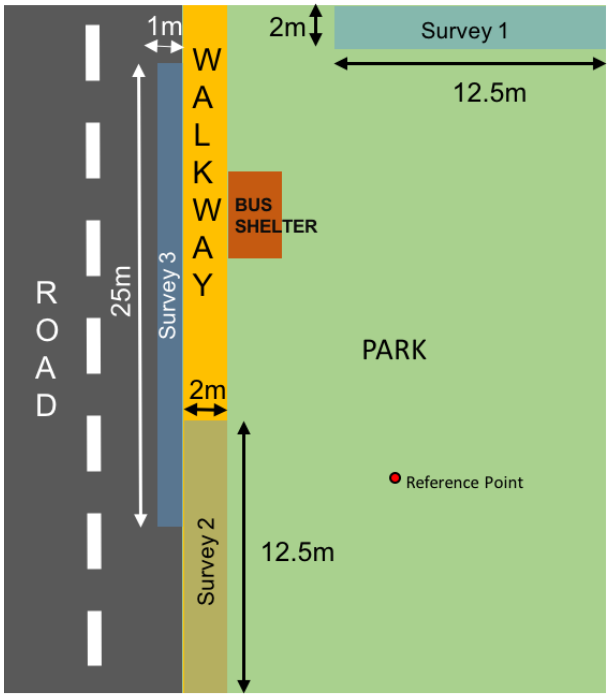
Site ID Code: AHIIO	Date: 16/01/2019	Transect Number: 2 of 3
Transect length (m): 25 m	Transect width (m): 1 m	Total No. of surveyors: 3
Subsampled? Y N	Subsample measurement: N/A	*Dimension of **each** subsample (e.g. 50cm x 200cm)*

Transect Start:	Latitude: ..... -42.5678° S..... Longitude: .....142.5678° E ..... Start Time (00:00): .....09:30..... Photo numbers: .....01278.....	*Latitude and longitude recorded in decimal degrees (dd.dddd)* *Ensure GPS is in WGS 84* *Record Start Time of transect* *Photographer name and number of photo, taken from transect start point*
Transect End:	Latitude: ..... Longitude: ..... End Time (00:00): ..... Photo #/photog. name:	*Latitude and longitude recorded in decimal degrees (dd.dddd)* *Record End Time of transect* *Photographer name and number of photo, taken from transect end point*
Type of transect:	Walkway Car park **Roadway** School Public transport Drain Natural Veg. Wetland Park Disused Ag/ pasture Ag/ cultivated Other (specify):	*Circle the best option to describe the type of land use of the transect area*
Slope/gradient:	A B C D E **F**	*Difference in elevation from start to end of transect.* *A = Flat (no difference) B = 5-50cm (ankle to knee height)* *C = 50-100cm (knee to hip) D = 100-150cm (hip to chest)* *E = 150-180cm (chest to head) F = > 180cm (above head height)*
Vegetation height:	No vegetation **0 – 5cm** 5 – 50cm 50 – 100cm 100 – 200cm >200cm	*Height of the vegetation in the transect area*
Substrate colour (if visible):	White / cream Yellow Orange Brown **Black** Grey Red	*Predominant colour of substrate (not vegetation)*
Percent (%) Bare ground	100	*How much of the transect area is bare ground (i.e. un-vegetated) (in 10% intervals)*
Percent (%) of area surveyed:	100	*If unable to survey the whole area what was sampled (in 10% intervals)*
Cleanliness **at first glance**:	No debris visible **Scattered debris visible** Lots of debris visible Large amounts of dumped debris	
Evidence of dumping? (circle one or more)	**None** Construction Household Other(specify):	
Evidence of recent activities within transect area: (circle one or more)	None Clean-up or removal of rubbish Apparent spilled trash or rubbish **Storm or flood** High winds Public event Mowing	
Comments:		

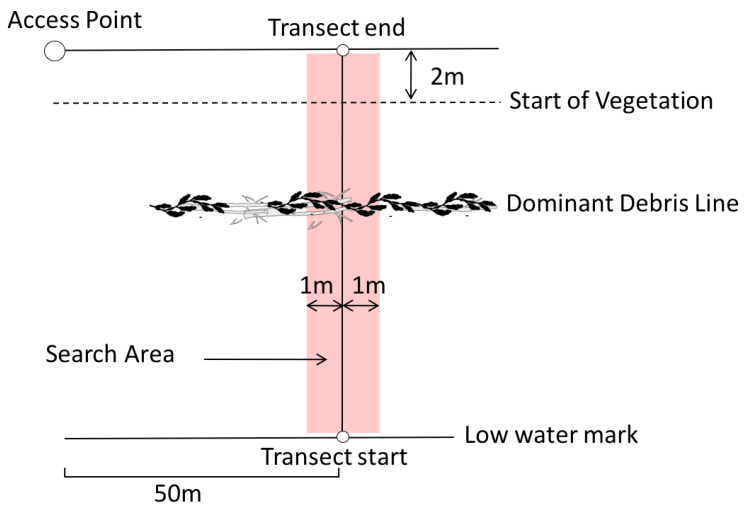
Name of data recorder: John Jackson

Name of person who entered data:

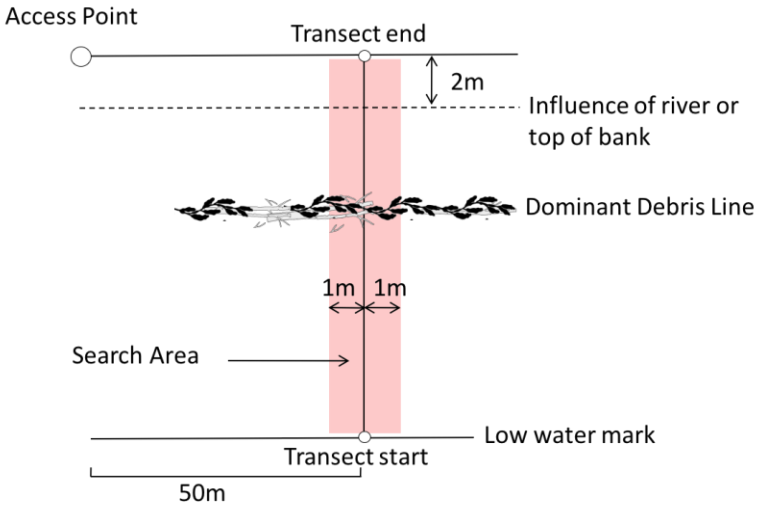
How to lay out transects for Inland, River, and Coastal Sites



Inland transects: Transects should be either 1m x 25m, or 2m x 12.5m. Transects should be situated in different land use types found within 100m of the reference GPS point. In this example, there are four habitats: Walkway, road edge, park, and public transport. You should conduct transects at three of these habitat types. If you do not find debris in any of them, run a fourth transect in the fourth habitat type.



River transects: Transects run from the waterline of the river, to 2 metres beyond the influence of the river. This can be determined by a change in vegetation, an erosion line, a forested area, or a high water mark debris line. If the influence of the river cannot be determined, the transect should run to 2 m beyond the top of the river bank. Be sure to mark the distance of the dominant debris line and the Influence of the river or the top of the river bank. Ensure that transect length is in whole meters (e.g. 26m, not 26.4m).



Coastal Transects: Transect should run from the water's edge to 2m beyond the start of continuous vegetation. Be sure to mark the distance of the dominant debris line on the **Coastal Transect Data** sheet. Ensure that transect length is in whole meters (e.g. 26m, not 26.4m).

7. Laying the transects (see page 17):
    a. **Inland** Transects: Decide whether you will use a 1 x 25 m transect or 2 x 12.5m transect. This will depend on the land-use type. For example, a road edge will be long and narrow, while it may be more convenient to run a wider transect in a park. Be sure to record the length and width of the transect on the **Inland Survey Data** sheet.
    b. **River sites:** Start the tape at the river's edge and lay the tape down from the marker to 2m beyond the edge of the influence of the river. This could be where you see a change in vegetation, an erosion line, a forested area, or a high water mark debris line. Think about how high the river would go in a minor flood, and go 2m beyond that. If it is too difficult to tell where the river's influence is, continue the transect to 2m beyond the top of the bank. Ensure that transect length is in whole meters (e.g. 26m, not 26.4m).
    c. **Coastal sites**: Start the tape at the water's edge and lay the tape down from the marker to 2m beyond the line of continuous vegetation. Ensure that transect length is in whole meters (e.g. 26m, not 26.4m).
8. Place your second marker at the end of the transect. When laying out the tape try not to walk along the transect line, because debris along the transect could be buried or uncovered as a result of walking along the line, Instead, walk the tape out in an arc and straighten the tape once at the end of the transect. Note the total length of the transect and record it on the **Transect Data** sheet.
9. As you are laying out the survey tape, take careful note of the amount of debris in the survey area. If it is too much to count accurately, choose a sub-sampling unit and follow the sub-sampling methodology (page 8).
10. Once you know the entire length of the transect, fill out the intervals for the size class on the **Items List** datasheet.
    a. Divide the total length of the transect by 10. This will give you equal intervals to collect size class data. E.g. If the total length of your transect is 26m, interval lengths will be 2.6m each.
    b. Starting from zero, record the beginning and end of each interval on the size class table on the **Items List** datasheet.

Size class (and sub-sampling intervals)

	Interval start (m) 26m
1	0 – 2.6
2	2.6 - 5.2
3	5.2 - 7.8
4	7.8 - 10.4
5	10.4 - 13.0
6	13.0 - 15.6
7	15.6 - 18.2
8	18.2 - 20.8
9	20.8 - 23.4
10	23.4 - end

11. Starting at your transect start point (at the water's edge for **River** or **Coastal** sites), record the start time. Take a photo of the transect looking up along it, and ensure you write down the number of the photo(s) and the name of the person who took the photos. Try to include the whole transect area in the photo. Record the photo number(s) on the datasheet.
12. In a two-person team, each person walks along either side of the tape looking for any items of debris within 1 metre (for 1m x 25m **Inland** transects, have one surveyor walk down one side of the tape). When looking for debris, DO NOT bend over. Walk upright and look down with your eyes. Pick up anything you are unsure of for closer inspection as lots of shells/rocks look like plastic and vice versa. Walk towards the end of the transect and record all debris items you observe from a standing position.

Figure 3.2 Surveyors walking either side of river transect line (left) and coastal transect line (right) searching for litter up to 1m from transect.

13. If you find debris, record it in the appropriate column of the **Items List** datasheet, either "Whole" for items that are identifiable as whole, or "Fragment" for items that are not whole. If you do not find debris, check the box labelled "No debris found"

Site ID Code: AHIIO **ITEMS LIST** **Page** 1 **of** 1

Date: 16/1/19 ☐ **No debris found** **Transect No.** 3 **of** 3 **Subsampled? Y** (N)

	ITEMS	ID	Fragment	Whole		ITEMS Cont.	ID	Fragment	Whole
ard Plastic	Pipe/PVC	H1	~~IIII~~		Foam	Food container	D1		1
	Beverage bottle <1 L	H2	III+16+2	~~IIII~~		Cup/plates/bowls	D2		
	Other bottle	H3	~~IIII~~ IIII			Polystyrene	D4	III	
	Bottle cap/lid	H4				Unknown/other	D5	2	
	Food container	H5		III		Cigarette/butt	P1		
	Utensil/plate/bowl	H6	5			Paper/cardboard	P2		

14. Remember to collect a size class for the first item found in each interval. The size class is based on the longest dimension of the item that fits within the size class box (See Appendix A. Marine Debris Size Chart). For the first piece of debris you find in each interval, record the distance along the transect, the ID of the item and whether it is a fragment or whole (e.g. G1W, D5F), and the size class of the item.

Size class (and sub-sampling intervals)

	Interval start (m) 26m	Dist. on tran	ID	Size class
1	0 – 2.6	0.5	G3W	2
2	2.6 – 5.2	2.8	R1W	5
3	5.2 – 7.8	None		
4	7.8 – 10.4	10.3	D5W	1
5	10.4 – 13.0	10.5	D5F	1
6	13.0 – 15.6			
7	15.6 – 18.2			
8	18.2 – 20.8			
9	20.8 – 23.4			
10	23.4 - end			

NOTE: Record the size class **ONLY** for the **FIRST** item you see in each interval. If there is no debris in an interval, skip it and keep going.

15. **River and Coastal transects:** When you reach the dominant or high tide debris line record the distance along the transect. Often the dominant debris line may be several meters wide along the site. Choose what you think is the 'central' point to record in the datasheet. Note that in some cases there may be no debris line (mark N/A on the sheet), or there may be more than one debris line (choose the most dominant one). For **River transects**, also record the distance from the water's edge to the highest point that water comes up the bank. You may see an erosion line here. Also record the distance to the top of the bank, if it is within your transect.
16. Continue your survey, recording everything you find until you have reached the end of your transect (**River Transects -** 2m past the influence of the river. **Coastal Transects** – 2m into the surrounding vegetation).
17. When you have finished tallying the debris in the transect, take another GPS reading at the end marker. This is the 'Transect End.' Also record the time for ending the transect and take a photo(s) looking back towards the first transect marker. Please remember to record photo number(s) and the name of the photographer on the datasheet.

Inland Transect Data

Site ID Code: AHI10	Date: 16/01/2019	Transect Number: 2 of 3
Transect length (m): 25 m	Transect width (m): 1 m	Total No. of surveyors: 3
Subsampled? Y (N)	Subsample measurement: N/A	*Dimension of **each** subsample (e.g. 50cm x 200cm)*

Transect Start:	Latitude: ..... -42.5678° S..... Longitude: .....142.5678° E ..... Start Time (00:00): .....09:30..... Photo numbers: .....P1278.....	*Latitude and longitude recorded in decimal degrees (dd.dddd) Ensure GPS is in WGS 84* *Record Start Time of transect* *Photographer name and number of photo, taken from transect start point*
Transect End:	Latitude: ..... -42.5878° S..... Longitude: .....142.7678° E ..... Start Time (00:00): .....09:30..... Photo numbers: .....P1279, P1280, Jack.....	*Latitude and longitude recorded in decimal degrees (dd.dddd)* *Record End Time of transect* *Photographer name and number of photo, taken from transect end point*

Figure 3.3 Left: Example of a survey transect on a riverbank, showing the tape extending 2m beyond the influence of the river. Right: Example of a survey transect at a coastal site, showing the tape extending 2m beyond the vegetation.

18. Now you have completed one transect. Move to another land-use or habitat type and repeat steps 5-17 to conduct another survey. If there is only one land-use or habitat type at a site, walk 50m away from your first transect, and choose the next location by a random method.
19. Remember to complete a minimum of three transects per site. If you do not find any debris on the three transects, complete additional transects until you have either found a piece of debris or have completed 6 transects. Try to place transects in different land-use types, or locate them proportional to the area of the different land-use types. For tips on where to place your transects, see page 3.
20. Upon returning from the field, please enter the data into the Global Plastics Database.

4 Surface Trawl Methodology

4.1 Equipment list

ON THE BOAT (see below for more details)	
Equipment provided by us	**Equipment to source locally**
Trawl net	2-3 buckets for seawater
Tow rope	Watertight storage jars or ziplock bags x 18
Cod ends x 3	Marking pen to mark the containers, plus labels if necessary
Flow meter	Ladle, cup or lab bottle
Rod and 8 nuts to connect flow meter	GPS
Datasheets – 1 per station	Camera
	Compass

FOR THE LAB / SORTING STATION ON LAND	
Equipment provided by us	**Equipment for you to source**
	Three plastic tubs per station (clear or white)
	Tweezers
	Petri dishes
	Permanent marker
	Aluminium foil
	Good light source

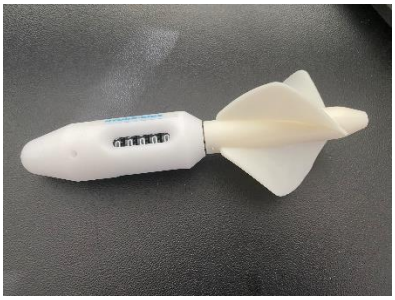
Equipment needed on the boat

Net

Tow Rope

3 x cod ends

Flow Meter (spinning tail on right)



Rod and 8 nuts (to connect flow meter)

2-3 buckets for seawater

1. Watertight storage containers such as jars, buckets, or zip lock bags to put debris (and water) from tows in. You will need one per tow, and there are three tows for each station, so bring at least 3 containers per station that you plan to sample). With a total of 9 stations across the three trawl lines, there will be a total of 27 separate samples.

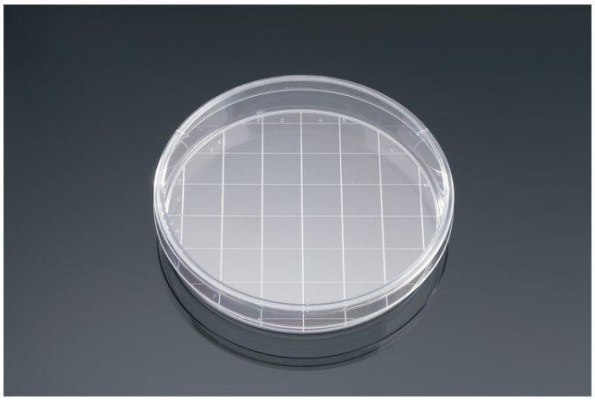
2. Marking pen that can mark sample numbers on the containers, plus labels if necessary.
3. Ladle, cup or lab bottle for rinsing trawl material (leaves, twigs, plastic, etc.) down to cod end of net with seawater.
4. Datasheets – 1 per station (best to take some spares, found here: https://research.csiro.au/marinedebris/resources/)
5. GPS (preferably hand-held or on boat console, as reception at sea may not permit accurate GPS locations from a mobile phone)
6. Camera (can be on mobile phone)
7. Compass (boat console or on hand-held GPS)
8. Windspeed app (blah blah for android or Blah blah for apple) should we just get it in sea state as with other data sheets?

Equipment for in the lab/sorting on shore

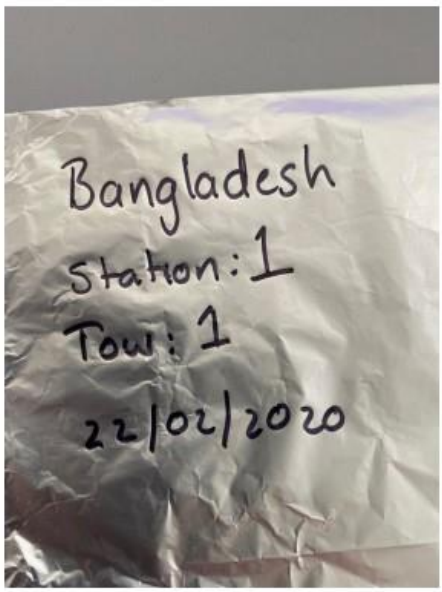
9. 3 x clear, white or light coloured plastic tubs, trays, or buckets.

10. Tweezers – one pair for each person processing samples, plus one spare. Very fine needle tweezers are ideal, and often two pairs of tweezers makes transfer of sample from tub to petri dish or foil easier.

11. Petri dishes (with 1cm x 1cm grid – can draw using fine permanent marker)



12. Permanent marking pen
13. Aluminium foil for storing samples



14. Light source – a battery-powered torch or flashlight or phone can assist with detection of plastics in samples

4.2 Methodology

This section outlines the methodology for deployment and use of surface trawl net sampling for marine debris. Note that these instructions cover five stages of trawl sampling:

- Requirements for survey vessel
- Identifying trawl line positions
- Before leaving land
- What to do on the boat
- How to sort samples back on land

4.2.1 Requirements for survey vessel

The boat used for the trawl sampling must be capable of motoring at 2-3 knots and travelling at least 12-15 nautical miles offshore. It should be big enough to hold a minimum of three surveyors, plus driver. Ideally there should be the capability to fit a boom to hold the net off to the side of the boat. The boom must be strong enough to withstand significant pressure of the net dragging through the water.

4.2.2 Identify position of the trawl lines

Trawls should be conducted nominally along three lines fanning out from the mouth of a major river running through an urban area in the study site. There are three stations on each line, with three tows at each station, for a total of 27 tows (Figure 4.1).

The lines should start as close to the shore as possible, leaving one nautical mile between the start points of each line. They should be centred around the mouth of the river and fan out from there. The position of the lines may need to be adjusted to avoid nearby islands or other land masses. Currents and wind will cause the actual trawl locations to vary from the ideal line. Therefore, we will not provide exact GPS locations for each tow, as we understand the need to adapt in the field. However, we recommend that you identify the compass heading for the direction of travel, and keep the boat moving that direction during each tow.

Each tow will be approximately 1 nautical mile (10-15 mins travelling at 2-3 knots). Leave at least 1 nautical mile (approx. 2km) between the end of one station and the beginning of the next (see Figure 4.1). This 4means that the total length of each trawl line will be approximately 12 nautical miles, but will vary depending on current, length of time setting up for next tow, etc.

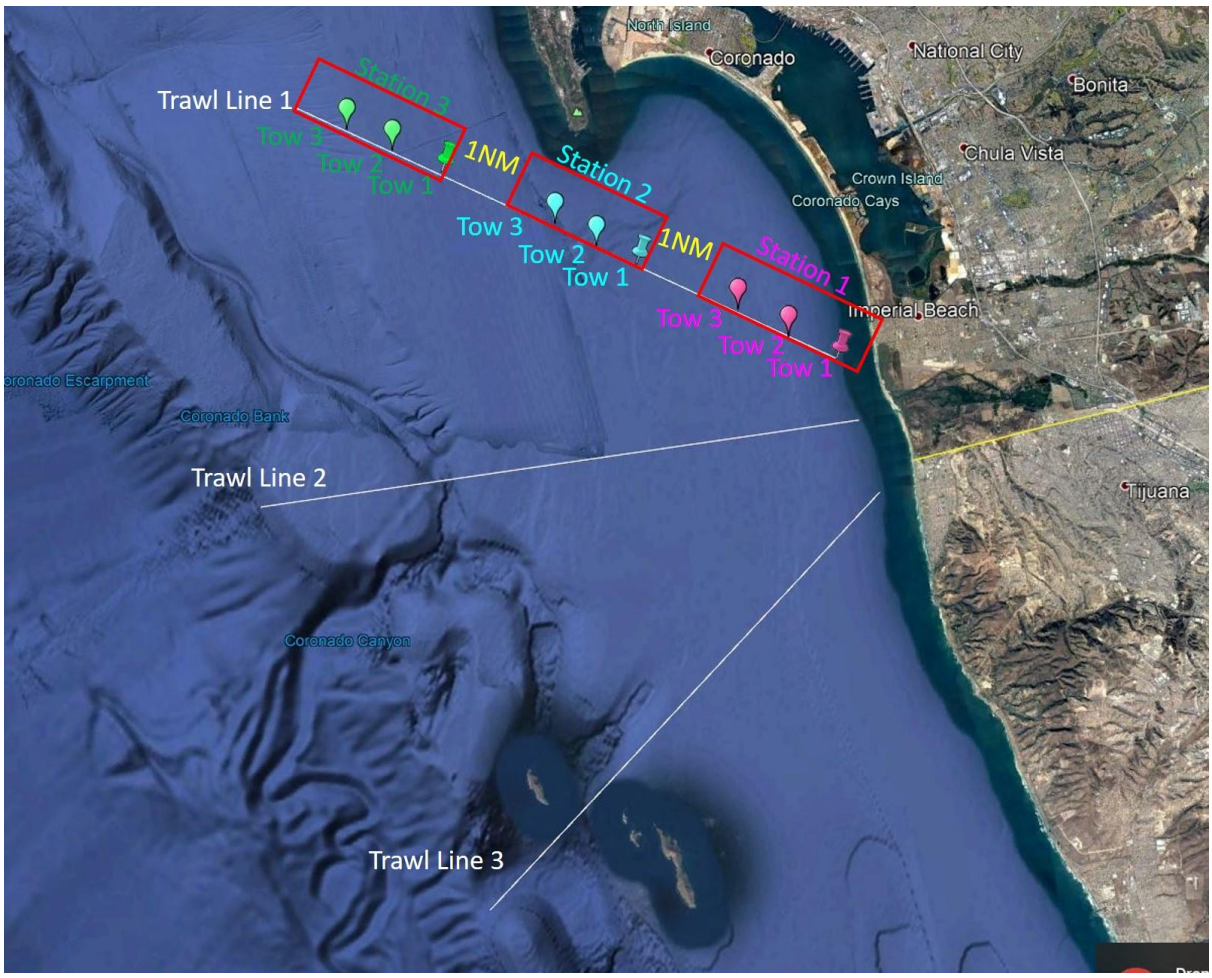


Figure 4.1 Nominal locations for each tow

We understand that it is not always possible to run straight lines due to islands, current, boat drift etc. This image shows optimal setup, but often you will have to adapt to local circumstances. this is not possible so do the best you can.

4.2.3 Before leaving land

Remove the net from the bag and check you have all the pieces, including four screws and wingnuts. Use the screws to attach the sides to the metal frame, as shown in Figure 2 to Figure 4.

Check the net for holes and repair if necessary. The standard net used by CSIRO has a mouth size of 60cm by 22cm, and a mesh size of 330 microns. If you are using a net other than the type provided by CSIRO, please ensure that the mesh size is 330 microns, and that you record the mouth dimensions on the **Surface Trawl Site Information** datasheet. Also ensure that it can be towed at the surface and does not sit below the water.

Figure 4.2 Trawl net unfolded from bag

Figure 4.3 Screws and wingnuts to hold the sides of the frame

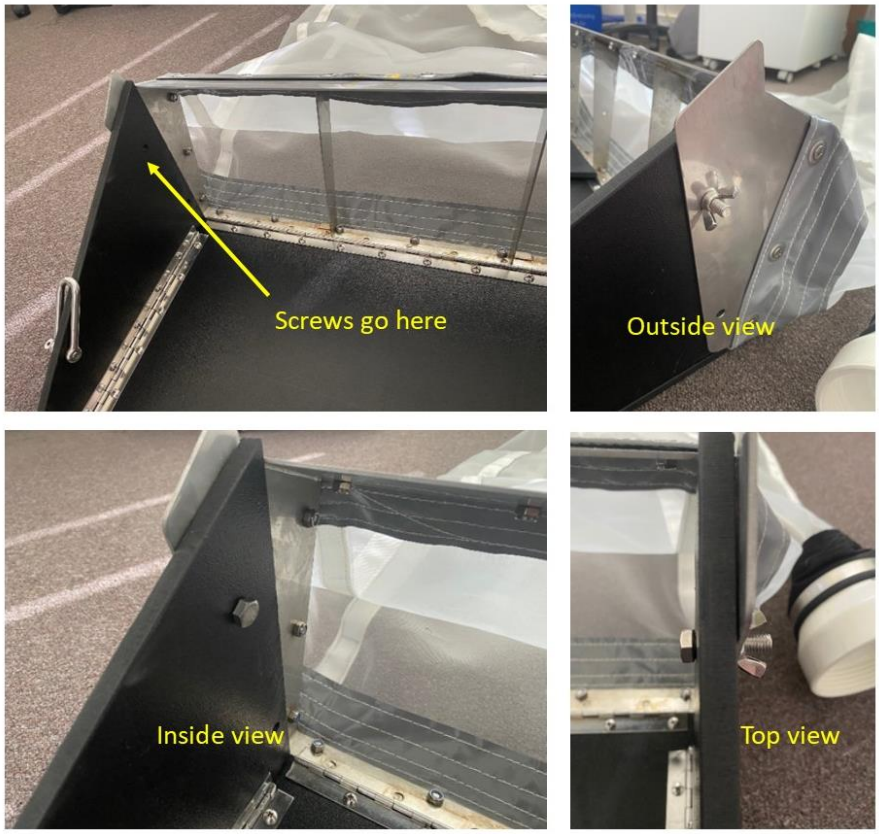


Figure 4.4 Fold the sides up and secure

4.2.4 On the vessel

1. Attach a cod end, making sure that it is clean of all debris. This cod end screws on to the net (see Figure *4.5*). While it is important to attach the cod end very firmly, ensure you only hand tighten so you can change the cod end between tows. You might want to add duct tape over the clamps holding the cod end mesh onto the pipe as seen below in Figure *4.6* this just adds extra security holding the mesh to the pipe.

Figure 4.5 Screw the cod end onto the net

Figure 4.6 Cod end on net as it is being towed. Note the duct tape around the clip holding mesh on to pipe, not necessary but is a good precaution

2. Attach the flow meter to the middle of the mouth of the net using the nuts and threaded rod provided (see Figure *7* – Figure *4.9*). Each flow meter has 8 nuts. One should be placed on either side of the flow meter to keep it in the middle of the rod. Place one nut flush against the inside frame of the net, and two outside of the frame, on each side. (see Figure *8*).

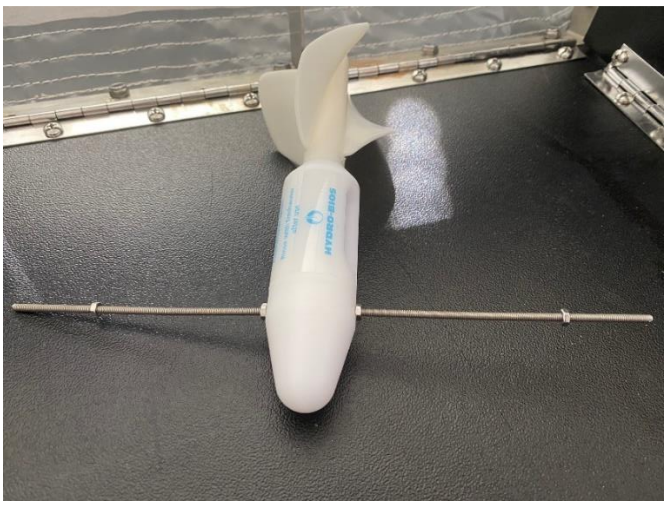


Figure 4.7 Thread the rod through the head of the flow meter and secure a nut on either side

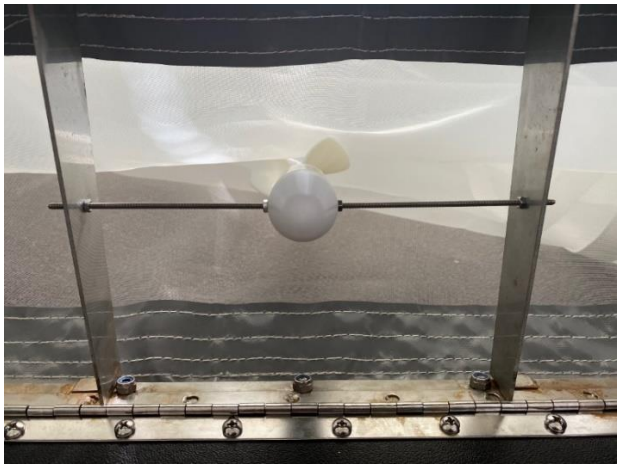


Figure 4.8 The flow meter in its correct position in the net

Figure 4.9 Position of nuts on net frame

3. Check that the flow meter is turning freely by ensuring the 'tail' spins without restriction. The flow meter shows how much water has passed through the mouth of the net. You will record the number shown on the flow meter at the beginning and end of each tow. This number can be recorded 'continuously,' meaning that it does not need to be reset to 0 at the beginning of each tow. During the tow, the flow meter may pass through 99999 and begin counting over again. This is not a problem and can be later taken into account when calculating the total flow.
4. Attach the tow rope to the net using the D shackles that are already fixed to the net frame.

Figure 4.10 D Shackle on side of net

Figure 4.11 Attach the two ends of the rope to the two D shackles

5. Attach the other end of the tow rope to a point on the vessel (or a boom off the boat if available) so that when you put the net in the water it will not be towed in the wake of the boat. It is best to tow alongside the vessel, not behind the boat. Ideally this will be accomplished by towing the net from a boom extending off the side of the vessel (eg, Figure *4.2*).

Figure 4.2 A surface trawl net towed by a boom on the side of a boat, note the net should run parallel with the boat and the ropes should not be twisted. The black top wood structure of the net should skim along the surface of the water.

6. Before you deploy the net, fill in as much of the **Surface Trawl Site Information** datasheet as possible.

SURFACE TRAWL SITE INFORMATION

STATION DETAILS		
Country	Australia	
Location	Derwent River	*(e.g. river name, nearest city, etc)*

Station Number	3		
Surveyor name and organisation	Jack Doe, CSIRO		
Date *(local; dd/mm/yyyy)*	16/10/2017		
Net type	CSIRO net		
Net mesh size	330 micron		
Net mouth dimensions	60cm x 22cm		
Salinity *(if known, ppt)*	35	**Sea surface temperature** *(°C)*	14.2

TOW DETAILS			
Tow Number	**1**	**2**	**3**
Sea State *(see notes: 0-5)*	2		
Wind direction *(degrees)*	325		

7. Make sure the boat is going at a speed of 2-3 knots (3.7 – 5.5km/h), and double check all net rigging and the cod end before you begin.
8. Make sure to write in the 5-digit number from the flow meter before you start.
9. Deploy the net over the side of the vessel and record start latitude and longitude in decimal degrees (dd.dddd) and start time.

Wind direction *(degrees)*	325		
Start latitude *(decimal deg)*	-42.9519		
Start longitude *(decimal deg)*	-147.9239		
Start time *(local / UTC)*	13:20 local		
Start flow meter count	13080		

10. Tow the net for approximately 15 minutes, while vessel is moving at a speed of 2-3 knots. This will give you a travel distance of approximately one nautical mile (just under 2 kms).
11. Pull the net out of the water after 15 minutes. Record end latitude and longitude, end time, duration of tow, and flow meter end count on the data sheet.
12. Keep the boat heading in the same direction at the same speed as you prepare for the next tow along this transect line.
13. Take the cod end off and wash contents into a bucket using sea water. Make sure to wash cod end thoroughly to get all debris out. **Label bucket with station and tow number (EG – S1T1, S1T2, S1T3 etc)**, and attach a new, clean cod end.

Figure 4.13 Cod end washed out in bucket, bucket labelled with S1T1 meaning Station 1, Tow 1.

14. Repeat steps 5 to 10 for tow 2 and tow 3.
15. Once you have finished the station, wash the net and cod ends thoroughly making sure that there is NO debris in the cod end or net as this will contaminate the next sample.
16. Travel at least 1 nautical mile between the end of one station and the beginning of the next station on the same line.
17. Repeat steps 5-14 for all stations

4.2.5 Trawl sample sorting – WHEN YOU'RE BACK ON LAND

Once you are back on land, wash all trawl gear thoroughly in fresh water and leave to dry before packing back up in bag.

Sorting of the trawl samples occurs back on land, not in the boat. We ask that team members have three separate 'looks' at each tow sample, each separated by a short break, because our eyes get tired when looking at the same thing for too long.

1. Using a permanent marker, draw a 1cm x 1cm grid on the bottom of a clear plastic petri dish. Plastic samples will be placed in this dish, and the grid will allow us to estimate the size of the debris from the photograph.

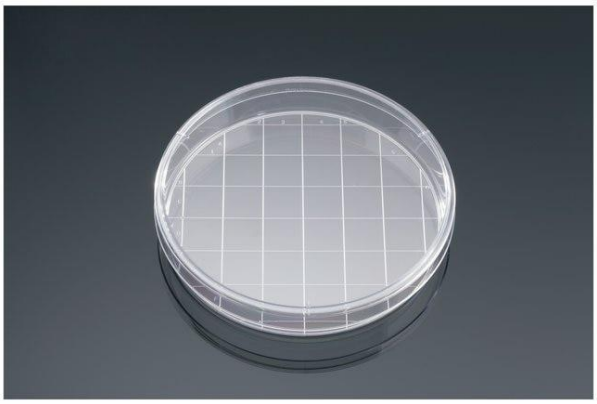


Figure 4.34 Petri dish with 1cm x 1cm grid

2. Tip the contents of station 1 tow 1 into a clear plastic tub, making sure that the rinse water also goes into the tub.

Figure 4.15 Empty the contents of the bucket/jar/sealable bag (whatever you have used to collect debris) into the sorting container

3. Set a timer and look for plastic in the sample for a minimum of 15 minutes. Remove any natural or organic material such as seaweed etc. from the bucket, making sure there are no pieces of debris stuck to the organic material. If there is a lot of organic material in the sample, the first look may take more than 15 minutes.
4. Using metal tweezers, remove all pieces of debris you see (using natural light) and put them in the gridded petri dish.

Figure 4.16 Removing samples using tweezers

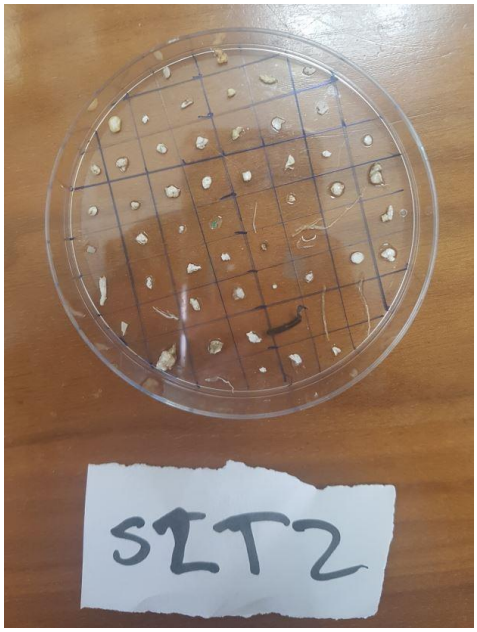


Figure 4.17 Samples placed in gridded petri dish

5. Tally the debris on the **Surface Trawl Collections** datasheet. Record the observer's name for each sort, and take turns observing and recording.

   ***** After allowing at least 15 minutes for the first sort, take a break *****

Surface Trawl Collection Data

Country	Australia
Location *(e.g. river name, nearest city*	Derwent River
Station Number	3

Collection Data	Separate the three sorts for each sample in the boxes provided								
Tow Number	**1**			**2**			**3**		
Sorted By (name)	Jack Doe								
Sort number	1	2	3	1	2	3	1	2	3
Hard plastic	3	1	0						
Soft plastic	6	2	1						
Plastic line / fibres	1	0	0						
Foam / Styrofoam	3	0	0						
TOTAL PLASTIC	13	4	1						
Photo details									
Notes									

6. Do a second 15-minute sort on the same sample by repeating steps 3 to 5. Add any new pieces of debris found into the same petri dish.

   ***** Take a short break *****

7. Do a third ten-minute sort on the same sample, but this time use torch light (if available) to search for debris.

8. If you find anything that you are unsure of, have a look under a dissecting microscope (if available). If in doubt, include in the sample.
9. Once you have completed your 3 sorts for the tow or the petri dish is full, set the dish on a piece of paper with the station, tow number, and date written on it. Take a photo of the dish and station information, then place the contents of the petri dish into a piece of foil that is folded to make an envelope (Figure *4.18*).

10. Label the foil with the following information (see Figure *8*):
    a. Country
    b. Station number
    c. Tow number
    d. Date

Figure 4.18 Best practice for labelling samples

11. Repeat for all tow samples

Appendix A. Marine Debris Size Chart

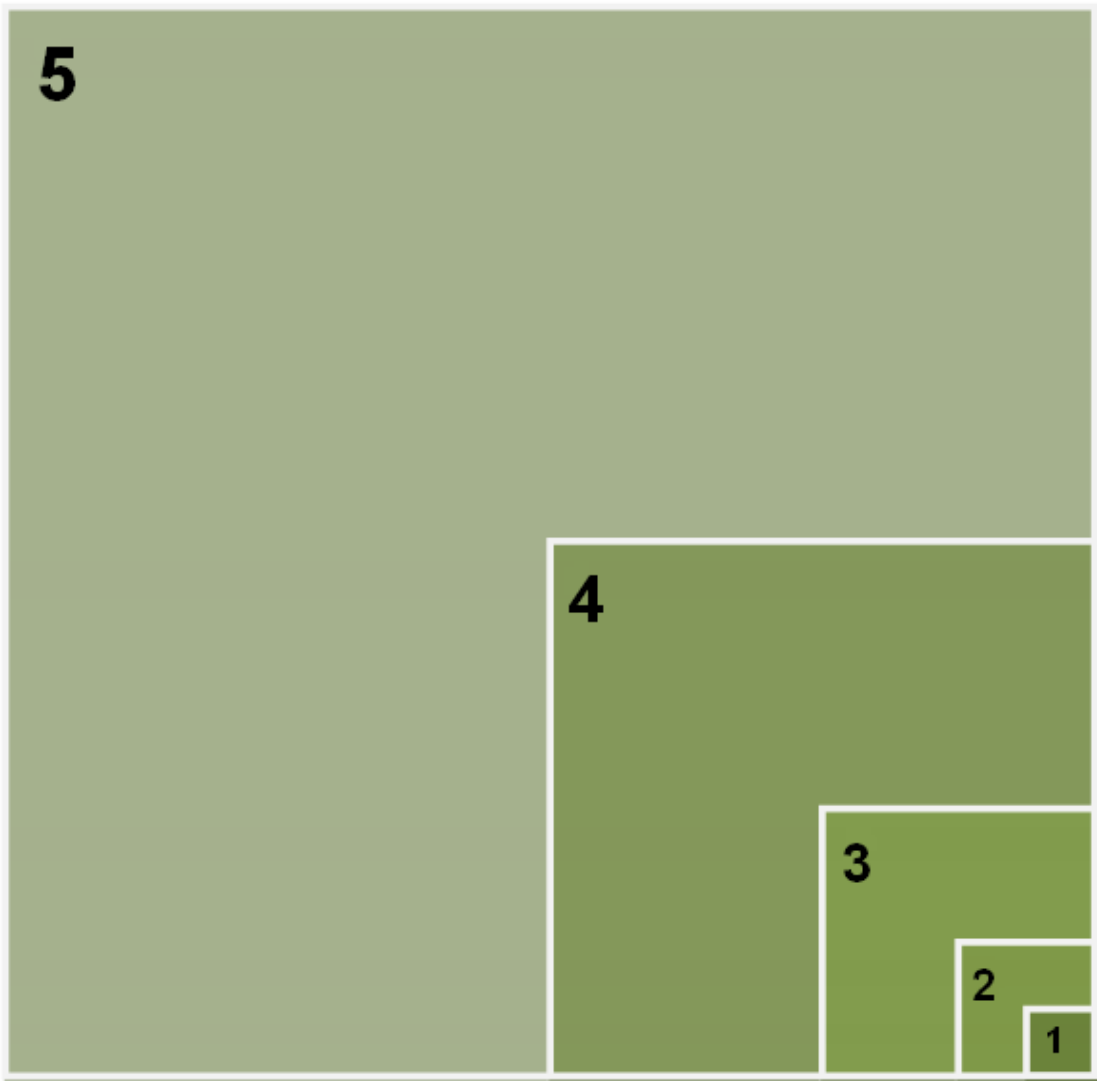
This chart should be used as a guide to help estimate the size of marine debris during surveys (see **Items List** datasheet)

The squares below represent different size classes. To estimate size class, determine which square the object's longest dimension will fit into. Objects should be measured on the diagonal.

1 = 0–1 cm^2 **2** = 1–2 cm^2 **3** = 2–4 cm^2 **4** = 4–8 cm^2
5 = 8–16 cm^2 **6** = 16-21 cm^2 **7** = >22 cm^2

7 *(larger than page)*

6 *(whole of page)*



Appendix B. Methods for gathering data during a clean-up

If you are conducting a clean-up, our suggestion is that you complete transect surveys in advance of your clean up. Please follow the **Transect Methodology** (see page 12), and gather data along 3-6 transects before you conduct the clean-up. Debris from these transects can of course be cleaned up as you go, as long as you record the data while you are conducting the survey. However, if you are conducting a larger sized clean-up, and would like to record data on the debris you have collected during your clean-up, then please follow the methods in this Appendix.

A few things to note before you start:

1. It is very important to have accurate measurements of the area cleaned, and an accurate count of ALL of the debris found within the survey area. If you are cleaning a very large area, choose a smaller section of it to collect data on. Take the time to thoroughly clean this area, picking up even the tiniest pieces of debris visible.
2. Choose the survey area randomly, without taking into account the amount of debris inside. A good way to do this is to walk 50m from the access point of the beach, then choose a random number and walk that many steps further. Then start the survey at that point.
3. Make sure that any debris collected for data purposes is placed in clearly marked bags with the beach name and survey number. Note that we can accept International Coastal Cleanup (ICC) or other similar clean-up data, if a few simple guidelines are followed.
    a. Report the area cleaned (length x width.
    b. Report the number of people participating in the clean-up.
    c. Report the total amount of time spend conducting the clean-up.
1. For the purposes of data collection, please ensure that you only report on debris that has been collected within the fixed area survey boundaries. If additional items are cleaned from outside the survey area, please ensure they are kept in separate, labelled bags to ensure high data quality.
2. Write in the comments area on the **Coastal Site Information** sheet that you have conducted a clean-up of transects or clean-up of a fixed area.

Equipment List

1. GPS (or GPS app on phone)
2. Compass (on your phone)
3. Camera (on phone)
4. 2 x 50m tape measures
5. Three markers that you can use to mark points on the ground (such as stakes, sticks, or rocks)
6. Pen/pencil
7. Data sheets - one **Site Information** sheet and at least 7 **Survey Data**/**Items List** datasheets
8. Gloves (optional), noting you will probably pick up many pieces of litter/rubbish to inspect them

Methodology

1. Walk to the spot where you access the site. This may be where you parked the car and can first see the beach/shore/river, it may be the boardwalk where you enter the site. It is often useful to take the first photo here, especially if there is a sign that names the site/beach.

Figure 4.4 Example access point for a coastal fixed area survey, where your first GPS waypoint is recorded

2. Take a GPS reading and record the latitude and longitude under the "Access point location" box and the GPS accuracy on the **Site Information** sheet.
3. Before you move on, fill out the rest of the details on the **Site Information** sheet in the sections SURVEYOR DETAILS and SITE DETAILS.

COASTAL SITE INFORMATION

SURVEYOR DETAILS		
Organisation:	CSIRO	*Organisation responsible for survey*
Surveyor name:	John Jackson	*Name of data recorder*
Contact number:	+61 234 567 890	*Contact number for data recorder*
Contact email:	John.Smith@csiro.au	*Contact email for data recorder*
Access point location:	Latitude: ..... -42.5678° S..... Longitude: .....142.5678° E	*Latitude and longitude of access point where you enter the beach (dd.dddd). Ensure GPS is in WGS 84.*
GPS accuracy:	+/- 3m	*Accuracy (metres) of GPS at time of reading.*

SITE DETAILS		
Location/Municipality	Hobart	*Town location of site*
Country:	Australia	*Country in which site was sampled*
Survey date:	16/10/2017	*Date survey undertaken (dd/mm/yyyy).*
Site name:	Dodges Ferry	*Unique name of site*
Photo number/s:	P1005	*The name of photographer and photo #s from the site*
Number of humans:	Time of day (00:00): .....09:30..... Visible distance (m): ...400..... No. of people: .....20.....	*Number of people counted in the visible area measured by instantaneous count. Visible distance is length of shore with a clear and unobstructed view.*

Current weather:	Clear Rain/Storm Overcast Drizzle	*Circle best option to describe the weather.*
Wind speed:	0 1 2 **3** 4 5	*0: calm (flat ocean)* *1: light breeze (wavelets, <10km/h, <6 knots)* *2: moderate breeze (small waves braking crests, 10-25km/h, 6-20 knots)* *3: strong breeze (waves and many white caps, 25-49km/h, 21- 26 knots)* *4: high wind (white caps and airborne spray, 50-65 km/h, 27-35 knots)* *5: gale (high waves, foam and spray present, 65-85 km/h, 35-45 knots)*
Wind direction: *(compass)*	N NE E **SE** S SW W NW N/A	*Direction from which wind is coming measured by the compass. N/A if no wind.*
Wind direction: *(relative to shore)*	onshore offshore sideshore **side-on** side-off	*Onshore: wind blowing towards shore* *Offshore: wind blowing towards sea* *Sideshore: wind blowing parallel to shore* *Side-onshore: wind blowing sideways and towards shore* *Side-offshore: wind blowing sideways and towards sea*
Date of last clean up:	Unknown	*If known.*
Access to site	Paved Unpaved **Trail** Other (specify):	
Trash cans or rubbish bins present?	**Yes** No	
Cleanliness **at first glance**:	No debris visible **Scattered debris visible** Lots of debris visible Large amounts of dumped debris	
Evidence of dumping? (circle one or more)	**None** Construction Household Other(specify):	
Evidence of recent activities at site: (circle one or more)	Clean-up or removal of rubbish Apparent spilled trash or rubbish Storm or flood **High winds** Public event Mowing	
Comments: Conducting clean up at site		

4. Have a look at the environment around you. If you plan to do only one survey, site it in the most abundant habitat type. If you plan to do additional surveys, and there are several different habitats or land use types at your site, site your surveys in different habitat types. (see Site Selection, page 6).
5. Walk 50m away from the access point. Once you are 50m from the access point, use a random method to select the location of the first survey at the water's edge (for example pick up a stone and throw it over your shoulder or pick a random number and walk that number of steps down the beach). Put in one of your survey markers here at the water's edge. This is the 'Transect Start' for transect 1 on your **Coastal Transect Data** sheet.
6. Fill in as much of the first page of the **Coastal Transect Data** sheet as you can BEFORE you begin to collect data on your survey. Make a note in the comments section that this is a fixed area clean-up survey.

Coastal Transect Data

Site Name: Dodges Ferry	Date 26/09/2017	Transect Number: 1 of 1
Transect length (m):	Transect width (m): 30 m	Total No. of surveyors: 10
Subsampled? Y (N)	Subsample measurement: N/A	*Dimension of **each** subsample area (e.g. 50cm x 200cm)*

Transect start:	Latitude: ..... -42.5678° S..... Longitude: .....142.5678° E ..... Start Time (00:00): .....09:30..... Photo #/photog. name: ..... John Jackson P1298.....	*Latitude and longitude recorded in decimal degrees (dd.dddd)* *Record Start Time of Transect* *Photographer name and number of photo, taken from transect start point*
Transect end:	Latitude: ..... Longitude: ..... End Time (00:00): ..... Photo #/photog. name:	*Latitude and longitude recorded in decimal degrees (dd.dddd)* *Record End Time of Transect* *Photographer name and number of photo,, taken from transect end point*
Distance to dominant debris line (m):		*Distance from water edge to major debris line (in meters) at time of survey. If no obvious debris line use NA.*
Beach gradient:	A (B) C D E	*Difference in elevation from start to end of transect.* *A = < 1 m (less than hip height)* *B = 1-2 m (hip to head height)* *C = 2-4 m (1-2 body length)* *D = 4-8 m (2-4 body lengths)* *E = > 8 m (more than 4 body lengths)*
Substrate type:	Mud (Sand) Pebble / Gravel Boulders Rock slab Mangrove	*Major substrate type*
Substrate colour (if visible):	White / cream (Yellow) Orange Brown Black Grey Red	*Predominant colour of substrate*
Backshore type:	(Cliff) Seawall Urban building Forest / Tree (> 3m) Shrub (< 3m) Dune Grass - tussock Grass - pasture Mangrove	*Physical structure of backshore, where beach meets terrestrial vegetation*
Shore exposure or shape:	Cove/bay (Straight) Headland	*Shape of beach where survey is conducted. Based on 50m each side of transect.*
Aspect:	N NE E SE (S) SW W NW	*Direction when you are facing the water*
Evidence of dumping? (circle one or more)	(None) Construction Household Other(specify):	
Evidence of recent activities within transect area: (circle one or more)	Clean-up or removal of rubbish Apparent spilled trash or rubbish Storm or flood High winds Public event Mowing	

Comments:

Debris collected as part of fixed area clean up

Name of data recorder: John Jackson

Name of person who entered data:

7. Start the tape at the water's edge and lay the tape down from the marker to 2m beyond the line of continuous vegetation (see Figure 4.2) and put second marker here (this will be the 'Transect end'). When laying out the tape try not to walk along the path of the transect line, because debris along the transect could be buried or uncovered as a result of walking along the line. Instead, walk the tape out in an arc and straighten the tape once at the end of the transect. Note the total length of the survey (to the nearest whole meter) and record it on the datasheet.

Coastal Transect Data

Site Name: Dodges Ferry	Date 26/09/2017	Transect Number: 1 of 1
Transect length (m): 48 m	Transect width (m): 30 m	Total No. of surveyors: 10
Subsampled? Y (N)	Subsample measurement: N/A	*Dimension of **each** subsample area (e.g. 50cm x 200cm)*

Figure 4.5 The survey transect should run 2m into backshore vegetation

8. Run a second tape along the water's edge, for as wide as you would like your survey to be. We recommend 30m, but you can select a larger area for larger groups, as long as you can confidently collect all of the debris within that area in your available time period.
9. Put in a third marker at the end of the survey. Record the width of your survey (to the nearest whole meter) on the **Coastal Survey Data** form in the "Transect width" field. The fixed area survey should look like Figure 4.6 below

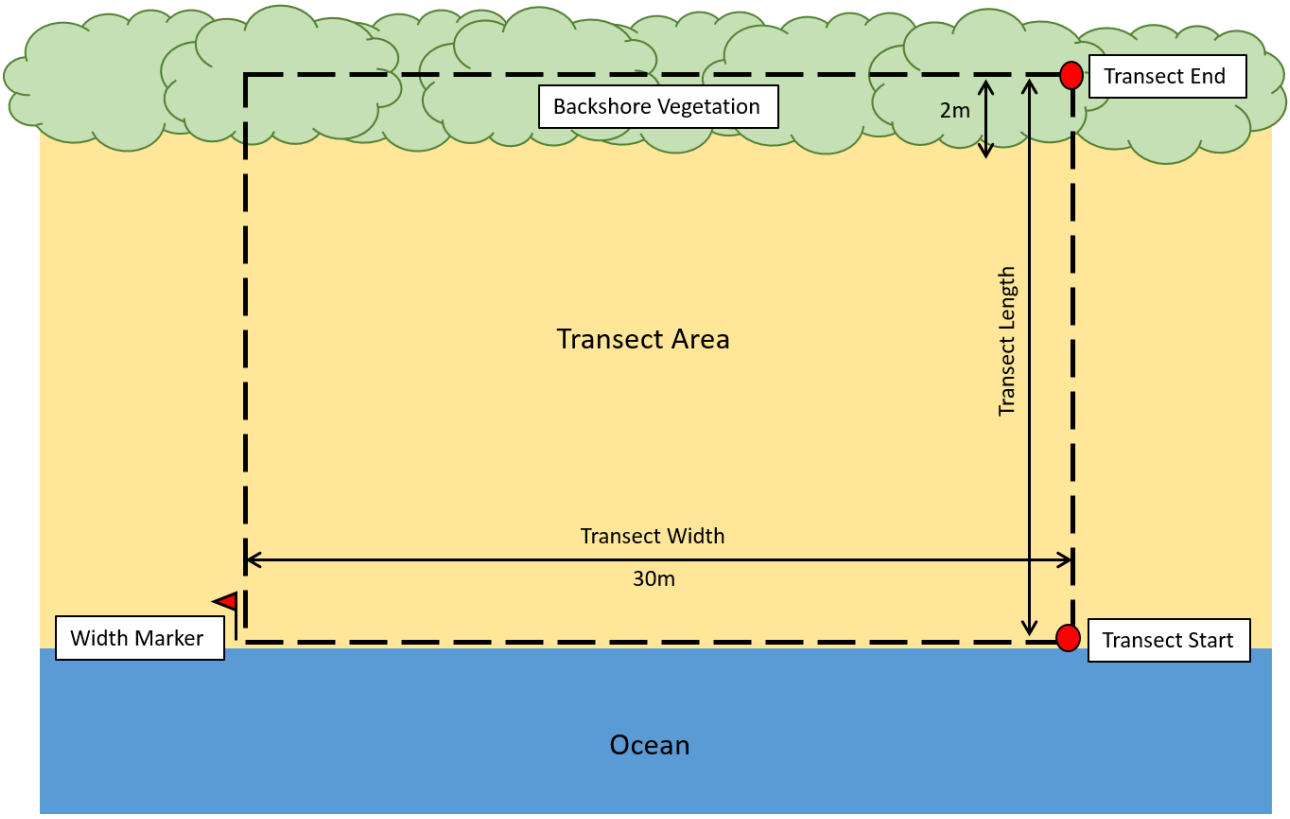


Figure 4.6 Diagram showing how to lay out a fixed area transect

10. Take a GPS reading at the marker at the water's edge, and record the Latitude, Longitude, and start time on the **Coastal Survey** Data sheet. Take a photo(s) of the survey area, and ensure you write down the number of the photo(s).
11. Participants should line up shoulder to shoulder starting at the water's edge and walk in a line along the width of the survey, picking up every piece of debris they see. When looking for debris, DO NOT bend over. Walk upright and look down with your eyes. Pick up anything you are unsure of for closer inspection, as lots of shells look like plastic and vice versa.
12. Once one line is done down the beach all observers then move up the transect length and come back down the width of the transect so the whole area (including 2m into the backshore vegetation) is cleaned. Please ensure that when the group returns back down the beach, that no areas are skipped or double counted. The best way to do this is for the line of observers to pivot around the last person in line. They will mark the area that has already been counted, and then the next sweep can start just beyond.

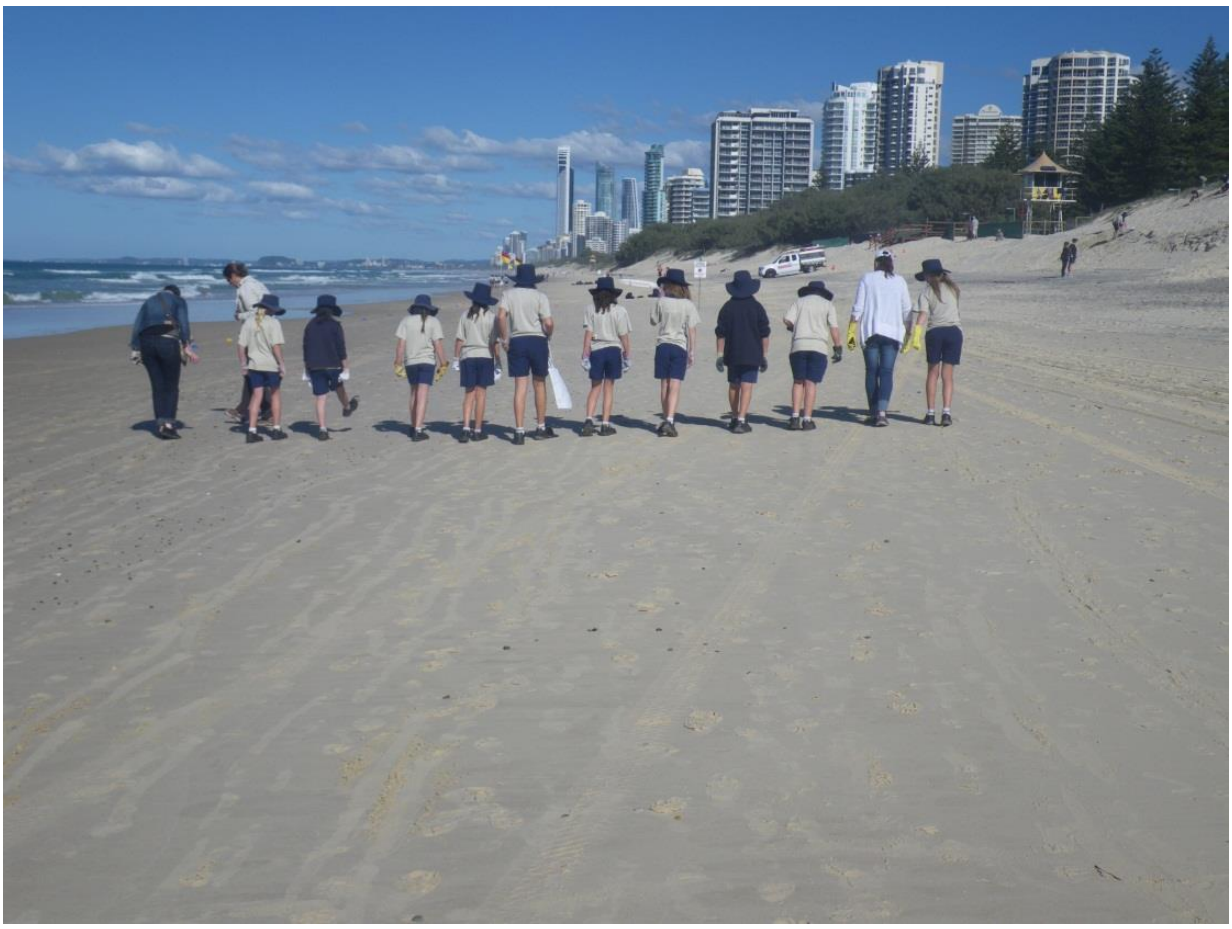


Figure 4.7 Surveying a fixed area, walking shoulder-to-shoulder

13. When you reach the dominant or high tide debris line record the distance along the transect. Often the dominant debris line may be several meters wide along the site. Choose what you think is the 'central' point to record in the datasheet. Note that in some cases there may be no debris line, or there may be more than one dominant debris line.

Transect start:	Latitude: ..... -42.5678° S..... Longitude: .....142..5678° E ..... Start Time (00:00): .....09:30..... Photo #/photog. name: ..... John Jackson P1298.....	*Latitude and longitude recorded in decimal degrees (dd.dddd)* *Record Start Time of Transect* *Photographer name and number of photo, taken from transect start point*
Transect end:	Latitude: ..... Longitude: ..... End Time (00:00):..... Photo #/photog. name:	*Latitude and longitude recorded in decimal degrees (dd.dddd)* *Record End Time of Transect* *Photographer name and number of photo,, taken from transect end point*
Distance to dominant debris line (m):	13 m	*Distance from water edge to major debris line (in meters) at time of survey. If no obvious debris line use NA.*

14. When you reach the transect end marker in the backshore vegetation, take another GPS reading and this will be your 'Transect End'. Also record the End time and take a photo(s).
15. Now you have completed one fixed area survey. REMEMBER: to mark the bags of collected debris with beach name and fixed area survey number.
16. If time allows and you want to do another survey, move 50m or more down the beach and repeat for another transect. Remember to mark bags collected with beach name and fixed area survey #2 and keep debris in a separate bag(s) to survey #1
17. When you have completed as many surveys as you wish, it's time to itemise and count the collected debris. Get the bags of debris from fixed area survey #1 and place them on the ground (somewhere where they will not be blown away, in a room/shelter is best).
    a. You will need to have 7 of the **Items List** datasheets – one for each size class
    b. Write the size category (Size class 1, Size class 2, etc). on the top of the **Items List** datasheet
    c. Sort the rubbish into respective size classes (page 38).
    d. For each size class record each item in the 'whole' or 'fragment' column next to the corresponding item, on the **Items List** datasheet which corresponds to that size class.
    e. If there is no debris found on the survey, please tick the box "no debris found" on the items list.
18. Enter the data into the Global Plastics Database

Appendix C. Datasheets

- Coastal Site Information sheet
- Coastal Transect Datasheet
- River Site Information sheet
- River Transect Datasheet
- Inland Site Information sheet
- Inland Transect Datasheet
- Items List
- Surface Trawl Site Information Datasheet
- Surface Trawl Collection Datasheet

COASTAL SITE INFORMATION

SURVEYOR DETAILS		
Organisation:		*Organisation responsible for survey*
Surveyor name:		*Name of data recorder*
Contact number:		*Contact number for data recorder*
Contact email:		*Contact email for data recorder*
Access point location:	Latitude: …… Longitude: ……	*Latitude and longitude of access point where you enter the beach (dd.dddd). Ensure GPS is in WGS 84.*
GPS accuracy:		*Accuracy (metres) of GPS at time of reading.*

SITE DETAILS		
Location/Municipality		*Town location of site*
Country:		*Country in which site was sampled*
Survey date:		*Date survey undertaken (dd/mm/yyyy).*
Site ID code:		*Site ID code (provided by CSIRO)*
Site name:		*Unique name of site*
Photo info:		*The name of photographer and photo #s from the site*
Number of humans:	Time of day (00:00): …… Visible distance (m): …… No. of people: ……	*Number of people counted in the visible area measured by instantaneous count. Visible distance is length of shore with a clear and unobstructed view.*
Current weather:	Clear Rain/Storm Overcast Drizzle	*Circle best option to describe the weather.*
Wind speed:	0 1 2 3 4 5	*0: calm (flat ocean)* *1: light breeze (wavelets, <10km/h , <6 knots)* *2: moderate breeze (small waves braking crests, 10-25km/h, 6-20 knots)* *3: strong breeze (waves and many white caps, 25-49km/h, 21- 26 knots)* *4: high wind (white caps and airborne spray, 50-65 km/h , 27-35 knots)* *5: gale (high waves, foam and spray present, 65-85 km/h, 35-45 knots)*
Wind direction: *(compass)*	N NE E SE S SW W NW N/A	*Direction from which wind is coming measured by the compass. N/A if no wind.*
Wind direction: *(relative to shore)*	onshore offshore sideshore side-on side-off	*Onshore: wind blowing towards shore* *Offshore: wind blowing towards sea* *Sideshore: wind blowing parallel to shore* *Side-onshore: wind blowing sideways and towards shore* *Side-offshore: wind blowing sideways and towards sea*
Date of last clean up:		*If known.*
Access to site	Paved Unpaved Trail Other (specify):	
Trash cans or rubbish bins present?	Yes No	
Cleanliness **at first glance**:	No debris visible Scattered debris visible Lots of debris visible Large amounts of dumped debris	
Evidence of dumping? (circle one or more)	None Construction Household Other(specify):	
Evidence of recent activities at site: (circle one or more)	None Clean-up or removal of rubbish Apparent spilled trash or rubbish Storm or flood High winds Public event Mowing	
Comments:		

Coastal Transect Data

Site ID Code:	Date	Transect Number: _____ of _____
Transect length (m):	Transect width (m):	Total No. of surveyors:
Subsampled? Y N	Subsample measurement:	*Dimension of **each** subsample area (e.g. 50cm x 200cm)*

Transect start:	Latitude: …… Longitude: …… Start Time (00:00): …… Photo #/photog. name: ……	*Latitude and longitude recorded in decimal degrees (dd.dddd)* *Record Start Time of Transect* *Photographer name and number of photo, taken from transect start point*
Transect end:	Latitude: …… Longitude: …… End Time (00:00): …… Photo #/photog. name: ……	*Latitude and longitude recorded in decimal degrees (dd.dddd)* *Record End Time of Transect* *Photographer name and number of photo,, taken from transect end point*
Distance to dominant debris line (m):		*Distance from water edge to major debris line (in meters) at time of survey. If no obvious debris line use NA.*
Beach gradient:	A B C D E	*Difference in elevation from start to end of transect.* *A = < 1 m (less than hip height)* *B = 1-2 m (hip to head height)* *C = 2-4 m (1-2 body length)* *D = 4-8 m (2-4 body lengths)* *E = > 8 m (more than 4 body lengths)*

Substrate type:	Mud Sand Pebble / Gravel Boulders Rock slab Mangrove	*Major substrate type*
Substrate colour (if visible):	White / cream Yellow Orange Brown Black Grey Red Green	*Predominant colour of substrate (not vegetation)*
Backshore type:	Cliff Seawall Urban building Forest / Tree (> 3m) Shrub (< 3m) Dune Grass - tussock Grass - pasture Mangrove	*Physical structure of backshore, where beach meets terrestrial vegetation*
Shore exposure or shape:	Cove/bay Straight Headland	*Shape of beach where survey is conducted. Based on 50m each side of transect.*
Aspect:	N NE E SE S SW W NW	*Direction when you are facing the water*

Evidence of dumping? (circle one or more)	None Construction Household Other(specify):
Evidence of recent activities within transect area: (circle one or more)	None Clean-up or removal of rubbish Apparent spilled trash or rubbish Storm or flood High winds Public event Mowing

Comments:

Name of data recorder: Name of person who entered data:

Name of observer: V1.3 Oct19

RIVER SITE INFORMATION

SURVEYOR DETAILS		
Organisation:		*Organisation responsible for survey*
Surveyor name:		*Name of data recorder*
Contact number:		*Contact number for data recorder*
Contact email:		*Contact email for data recorder*
Access point location:	Latitude: …… Longitude: ……	*Latitude and longitude of access point where you enter the beach (dd.dddd). Ensure GPS is in WGS 84.*
GPS accuracy:		*Accuracy (metres) of GPS at time of reading.*

SITE DETAILS		
Location/Municipality		*Town location of site*
Country:		*Country in which site was sampled*
Survey date:		*Date survey undertaken (dd/mm/yyyy)*
Site ID code:		*Site ID code (provided by CSIRO)*
River name:		*Unique name of site*
Photo info:		*The name of photog. and photo #s from the site*
Dominant land use	Industrial Residential Commercial/Municipal Natural/Parkland Agricultural Roadway	*Circle best option to describe the dominant land use at the site*
Number of humans:	Time of day (00:00): …….. Visible distance (m): …….. No. of people: ……	*Number of people counted in the visible area measured by instantaneous count. Visible distance is length of shore with a clear and unobstructed view.*
Current weather:	Clear Rain/Storm Overcast Drizzle	*Circle best option to describe the weather*
Wind speed:	0 1 2 3 4 5	*0: calm* *1: light breeze (<10km/h , <6 knots)* *2: mod. breeze (10-25km/h, 6-20 kn)* *3: strong breeze (25-49km/h, 21- 26 kn)* *4: high wind (50-65 km/h , 27-35 kn)* *5: gale (65-85 km/h, 35-45 kn)*
Wind direction: *(compass)*	N NE E SE S SW W NW N/A	*Direction from which wind is coming measured by the compass. N/A if no wind.*
Wind direction: *(relative to shore)*	onshore offshore sideshore side-on side-off	*Onshore: wind blowing towards shore* *Offshore: wind blowing away from shore* *Sideshore: wind blowing parallel to shore* *Side-on: wind blowing sideways and towards shore* *Side-off: wind blowing sideways and away from shore*
Date of last clean up:		*If known*
Access to river:	Paved Unpaved Trail Other (specify):	
Trash cans or rubbish bins present?	Yes No	
Cleanliness **at first glance:**	No debris visible Scattered debris visible Lots of debris visible Large amounts of dumped debris	
Evidence of dumping? (circle one or more)	None Construction Household Other(specify):	
Evidence of recent activities at site: (circle one or more)	None Clean-up or removal of rubbish Apparent spilled trash or rubbish Storm or flood High winds Public event Mowing	
Comments:		

River Transect Data

Site ID Code:	Date:	Transect No. _____ of _____
Transect length (m):	Transect width (m):	No. of surveyor(s):
Subsampled: Y N	Subsample measurement:	*Dimension of **each** subsample (e.g. 50cm x 200cm)*

Transect start:	Latitude: …… Longitude: …… Start Time (00:00): …… Photo #/photog. name: ……	*Latitude and longitude recorded in decimal degrees (dd.dddd)* *Start Time of Transect* *Photographer name and number of photo, taken from transect start point.*
Transect end:	Latitude: …… Longitude: …… End Time (00:00): …… Photo #/photog. name: ……	*Latitude and longitude recorded in decimal degrees (dd.dddd)* *Record End Time of Transect* *Photographer name and number of photo, taken from transect end point*
Distance to dominant debris line (m):		*Distance from water edge to major debris line. If not obvious, use NA.*
Distance to top of bank (m):		*Distance from water edge to top of the bank*
Distance of river influence/erosion line (m):		*Height that water comes up the bank/erosion line*
River gradient:	A B C D E	*Difference in elevation from start to end of transect.* *A = < 1 m (less than hip height, B = 1-2 m (hip to head height)* *C = 2-4 m (1-2 body length) D = 4-8 m (2-4 body lengths)* *E = > 8 m (more than 4 body lengths)*
Bank type:	Mud Sand Pebble/Gravel Cobble Boulders Rock slab Mangrove Dirt bank Vegetated Cement	*Major substrate type*
Bank substrate colour (if visible):	White/cream Yellow Orange Brown Black Grey Red Green	*Predominant colour of substrate (not vegetation)*
Bank vegetation:	Grass/Reeds Broadleaf/herb Shrub (< 3m) Tree (> 3m) Forest None	*Circle the best option to describe the type of vegetation on the transect*
Vegetation height:	No vegetation 0 – 5cm 5 – 50cm 50 – 100cm 100 – 200cm >200cm	*Height of the vegetation on the transect*
Percent (%) Bare ground %		*How much of the transect is bare ground (i.e. unvegetated) (in 10% intervals)*
Percent (%) of area surveyed:		*If unable to survey the whole area, what was sampled (in 10% intervals)*
Shore exposure or shape:	Cove / bay Straight Headland	*Shape of river where survey is conducted. Based on 50m each side of transect.*
Aspect:	N NE E SE S SW W NW	*Direction when you are facing the water*
River bank channelized? (e.g. human intervention changes course of river)	Yes No	Storm water drains present? Yes No
Evidence of dumping? (circle one or more)	None Construction Household Other(specify):	
Evidence of recent activities within survey area: (circle one or more)	None Clean-up or removal of rubbish Apparent spilled trash or rubbish Storm or flood High winds Public event Mowing	
Comments:		

Name of data recorder: Name of person who entered data:

Name of observer: V1.3 Oct19

INLAND SITE INFORMATION

SURVEYOR DETAILS		
Organisation:		*Organisation responsible for survey*
Surveyor name:		*Name of data recorder*
Contact number:		*Contact number for data recorder*
Contact email:		*Contact email for data recorder*
Site location:	Latitude: …… Longitude: ……	*Latitude and longitude of site location (dd.dddd). Ensure GPS is in WGS 84.*
GPS Accuracy		*Accuracy (metres) of GPS at time of reading*

SITE DETAILS		
Location/Municipality:		*Town location of site*
Country:		*Country in which site was sampled*
Survey date:		*Date survey undertaken (dd/mm/yyyy)*
Site ID code:		*Site ID code (provided by CSIRO)*
Site name:		*Unique name of site*
Photo number/s and name of photographer		*The name of photographer and numbers of photos taken at the site*
Dominant land use:	Industrial Residential Commercial/Municipal Natural/Parkland Agricultural Roadway	*Circle best option to describe the dominant land use at the site*
Number of humans:	Time of day (00:00): …… No. of people: ……	*Number of people counted in a 100 x 100m area*
Current weather:	Clear Rain/Storm Overcast Drizzle	*Circle best option to describe the weather.*
Wind speed:	0 1 2 3 4 5	*0: calm* *1: light breeze (<10km/h , <6 knots)* *2: mod. breeze (10-25km/h, 6-20 kn)* *3: strong breeze (25-49km/h, 21- 26 kn)* *4: high wind (50-65 km/h , 27-35 kn)* *5: gale (65-85 km/h, 35-45 kn)*
Wind direction: *(compass)*	N NE E SE S SW W NW N/A	*Direction from which wind is coming measured by the compass. N/A if no wind.*
Date of last clean up:		If known
Access to site:	Paved Unpaved Trail Other (specify):	

Trash cans or rubbish bins present?	Yes No
Cleanliness **at first glance**:	No debris visible Scattered debris visible Lots of debris visible Large amounts of dumped debris
Evidence of dumping? (circle one or more)	None Construction Household Other(specify):
Evidence of recent activities at site: (circle one or more)	None Clean-up or removal of rubbish Apparent spilled trash or rubbish Storm or flood High winds Public event Mowing
Comments:	

Name of data recorder: Name of person who entered data:

Name of observer: V1.3 Oct19

Inland Transect Data

Site ID Code:	Date:	Transect Number: _____ of _____
Transect length (m):	Transect width (m):	Total No. of surveyors:
Subsampled? Y N	Subsample measurement:	*Dimension of **each** subsample (e.g. 50cm x 200cm)*

Transect Start:	Latitude: …… Longitude: …… Start Time (00:00): …… Photo #/photog. name: ……	*Latitude and longitude recorded in decimal degrees (dd.dddd) Ensure GPS is in WGS 84* *Record Start Time of transect* *Photographer name and number of photo, taken from transect start point*
Transect End:	Latitude: …… Longitude: …… End Time (00:00): …… Photo #/photog. name: ……	*Latitude and longitude recorded in decimal degrees (dd.dddd)* *Record End Time of transect* *Photographer name and number of photo, taken from transect end point*
Type of transect:	Walkway Car park Roadway School Public transport Drain Natural Veg. Wetland Park Disused Ag/ pasture Ag/ cultivated Other (specify):	*Circle the best option to describe the type of land use of the transect area*
Slope/gradient:	A B C D E F	*Difference in elevation from start to end of transect.* *A = Flat (no difference) B = 5-50cm (ankle to knee height)* *C = 50-100cm (knee to hip) D = 100-150cm (hip to chest)* *E = 150-180cm (chest to head) F = > 180cm (above head height)*
Vegetation height:	No vegetation 0 – 5cm 5 – 50cm 50 – 100cm 100 – 200cm >200cm	*Height of the vegetation in the transect area*
Substrate colour (if visible):	White / cream Yellow Orange Brown Black Grey Red	*Predominant colour of substrate (not vegetation)*
Percent (%) Bare ground		*How much of the transect area is bare ground (i.e. un-vegetated) (in 10% intervals)*
Percent (%) of area surveyed:		*If unable to survey the whole area what was sampled (in 10% intervals)*
Cleanliness **at first glance**:	No debris visible Scattered debris visible Lots of debris visible Large amounts of dumped debris	
Evidence of dumping? (circle one or more)	None Construction Household Other(specify):	
Evidence of recent activities within transect area: (circle one or more)	None Clean-up or removal of rubbish Apparent spilled trash or rubbish Storm or flood High winds Public event Mowing	
Comments:		

Name of data recorder: Name of person who entered data:

Name of observer: V1.3 Oct19

Site ID Code: **ITEMS LIST** **Page _____ of _____**

Date: **No debris found** **Transect No. ____ of ____** **Subsampled? Y N**

	ITEMS	ID	Fragment	Whole
Hard Plastic	Pipe/PVC	H1		
	Beverage bottle <1 L	H2		
	Other bottle	H3		
	Bottle cap/lid	H4		
	Food container	H5		
	Utensil/plate/bowl	H6		
	Bucket/Crate	H7		
	Lighter	H8		
	Lollipop stick/earbud	H9		
	Unknown/other hard	H10		
Soft Plastic	Thin film carry bag	S1		
	Food wrapper/label	S2		
	Sheeting	S3		
	Cup/lid	S4		
	Straw	S5		
	Unknown/other soft	S6		
	Other plastic bag	S7		
Plastic Straps	String/rope/ribbon	BP1		
	Packing strap	BP2		
	Cable ties	BP3		
	Unknown/other strap	BP4		
Metal	Pipe	M1		
	Wire	M2		
	Aerosol	M3		
	Beverage can	M4		
	Food can/tin	M5		
	Lid/cap	M6		
	Food wrapper	M7		
	Aluminium foil	M8		
	Bucket/drum	M9		
	Unknown/other hard	M10		
	Unknown/other soft	M11		
Glass	Beverage bottle	G1		
	Jar	G2		
	Light globe/tube	G3		
	Unknown/other glass	G4		
Rubber	Thong/shoe	R1		
	Tyre	R2		
	Balloon	R3		
	Rubber band	R4		
	Unknown/other	R5		
Cloth	String/rope/strap	C1		
	Clothing/towel	C2		
	Wipes/cloths	C3		
	Insulation/stuffing	C4		
	Unknown/other	C5		
Timber	Wood/timber	T1		
	Utensil/food stick	T2		
	Bottle cork	T3		
	Pallet	T4		
	Unknown/other	T5		

	ITEMS Cont.	ID	Fragment	Whole
Foam	Food container	D1		
	Cup/plates/bowls	D2		
	Polystyrene	D4		
	Unknown/other	D5		
Paper	Cigarette/butt	P1		
	Paper/cardboard	P2		
	Magazine/newspaper	P3		
	Bag	P4		
	Box	P5		
	Food container/box	P6		
	Food wrapper/bag	P7		
	Beverage container	P8		
	Cups	P9		
	Plates/bowls	P10		
	Unknown/other	P11		
Fishing	Net	F1		
	Fishing line	F2		
	Fishing Lures	F3		
	Buoys/floats	F4		
	Glow stick	F5		
	Fishhook/sinker	F6		
	Unknown/other	F7		
Miscellaneous	Battery	Z1		
	Brick/cement	Z2		
	Carpet	Z3		
	Ceramic	Z4		
	E Waste	Z5		
	Furniture	Z6		
	Appliances	Z7		
	Large car parts	Z9		
	Large boat parts	Z10		
	Bag/box dom. waste	Z11		
	Nurdles	Z12		
Other		O1		
		O2		
		O3		
		O4		
		O5		
		O6		

Size class (and sub-sampling intervals)

Interval start (m)	Dist on tran	ID (F/W)	Size class
1 0 -			
2			
3			
4			
5			
6			
7			
8			
9			
10 - (end)			

SURFACE TRAWL SITE INFORMATION

STATION DETAILS			
Country			
Location		*(e.g. river name, nearest city, etc)*	
Station Number			
Surveyor name and organisation			
Date *(local; dd/mm/yyyy)*			
Net type			
Net mesh size			
Net mouth dimensions			
Salinity *(if known, ppt)*		**Sea surface temperature** *(℃)*	

TOW DETAILS			
Tow Number	**1**	**2**	**3**
Wind speed *(true, kn)*			
Wind direction (degrees)			
Start latitude (decimal deg)			
Start longitude (decimal deg)			
Start time *(local / UTC)*			
Start flow meter count			
End latitude *(-S)*			
End longitude *(E)*			
End time *(local / UTC)*			
End flow meter count			
Average vessel speed *(ground, kn)*			
Average vessel direction (degrees)			
Average depth *(local, m)*			
Notes			

Surface Trawl Collection Data

Country	
Location *(e.g. river name, nearest city, etc)*	
Station Number	

Collection Data				Separate the three sorts for each sample in the boxes provided					
Tow Number	1			2			3		
Sorted By (name)									
Sort number	1	2	3	1	2	3	1	2	3
Hard plastic									
Soft plastic									
Plastic line / fibres									
Foam / Styrofoam									
TOTAL PLASTIC									
Photo details									
Notes									

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FOR FURTHER INFORMATION

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