



# **Handbook of Survey Methodology**

## **Plastics Leakage**

**(developed for CSIRO Global Plastic  
Pollution Baseline Project)**

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12 March 2019

Version 1.3

### Citation

Schuyler QA, Willis K, Lawson TJ, Mann V, Wilcox C, and Hardesty BD (2018) Handbook of Survey Methodology – Plastics Leakage. CSIRO, Australia. ePublish EP178700

### Keywords

marine debris; marine plastics; marine pollution; environmental pollution; debris surveys; survey methodology; beach clean-up.

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# 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<sup>2</sup> 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 30.

## 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 record 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.

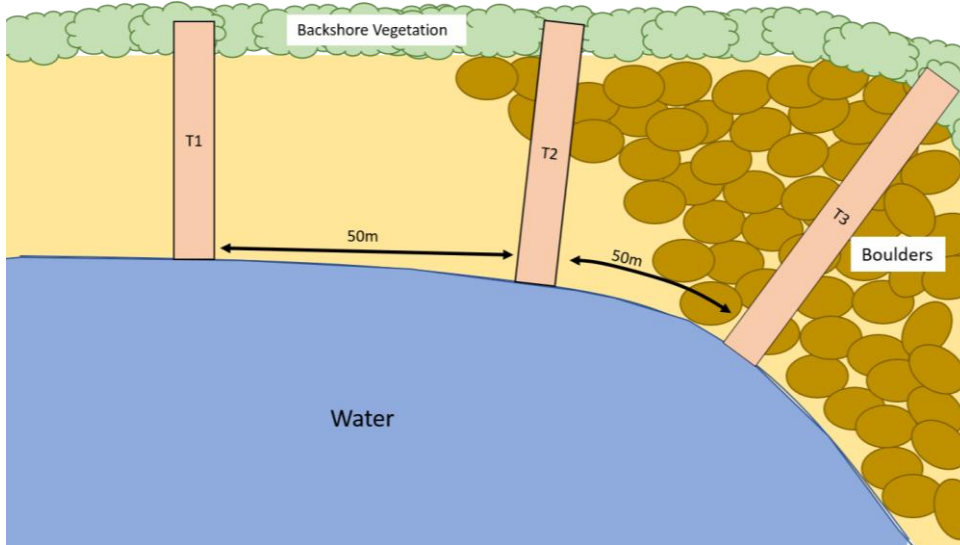


Figure 2.1 Example of how to lay out three transects in a coastal area.

### 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.

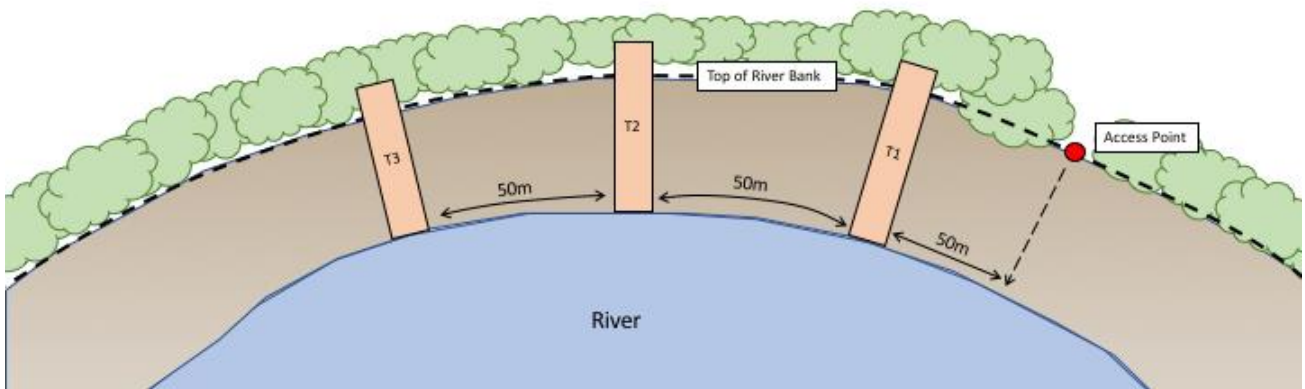


Figure 2.2 Example of how to lay out three transects in a river survey

## 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	<i>Circle the best option to describe the type of land use of the survey area</i>
	Drain	Natural Veg.	Wetland	Park	Disused	
	Ag/ pasture	Ag/ cultivated	Other (specify):			

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.

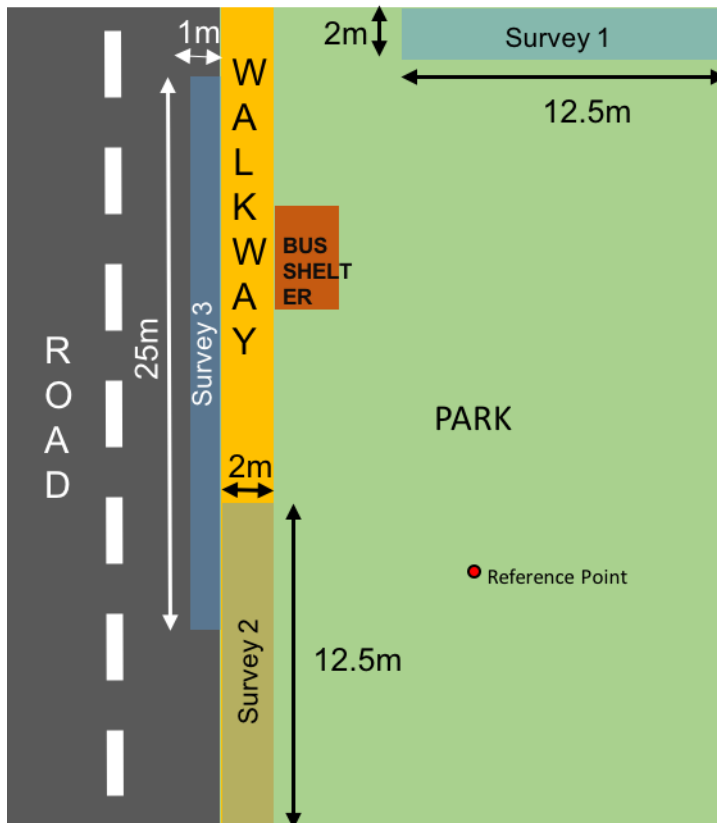


Figure 2.3 Example of an inland survey across different land use types

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.



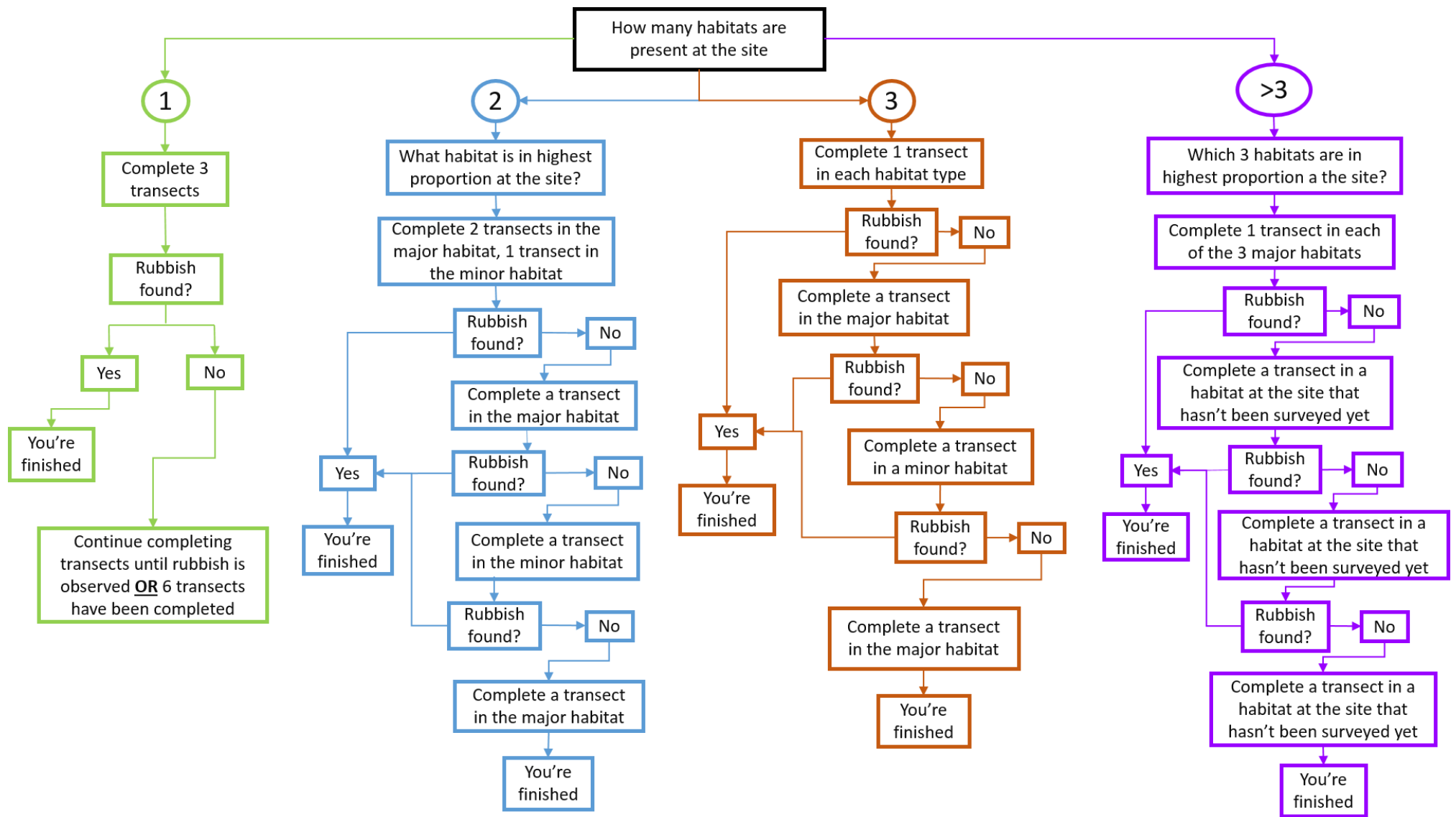


Figure 2.4. Decision tree to aid in figuring out where to place transects at your site location.

## 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) <sup>26m</sup>	Dist. on tran	ID	Size class
1 0 - 2.6	0.5	G3W	2
2 2.6 - 5.2	2.8	RIW	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.28). 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.

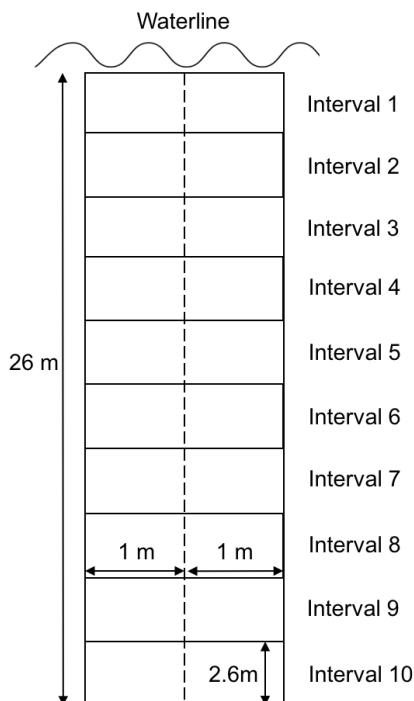
3. Record the subsample measurement on the top of the **Transect Data** sheet. Circle Y on the **Transect Data** sheet and the **Items List** datasheet to indicate that you have subsampled the data.

Coastal Transect Data		
Site Name: Dodges Ferry	Date 26/09/2017	Transect Number: <u>3</u> of <u>3</u>
Transect length (m): 26m	Transect width (m): 2m	Total No. of surveyors: 3
Subsampled? <input checked="" type="radio"/> Y <input type="radio"/> 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.



Transect length = 26 m  
Interval length =  $\frac{26}{10} = 2.6$  m  
Subsample length =  $\frac{2.6}{10} = 26$  cm  
Total debris per interval = debris count  $\times$  10  
e.g if you count 4 pieces, record 40 on the data sheet.

- 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  
 Date: 16/1/19  No debris found  
 ITEMS LIST  
 Transect No. 2 of 3  
 Page 1 of 2  
 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

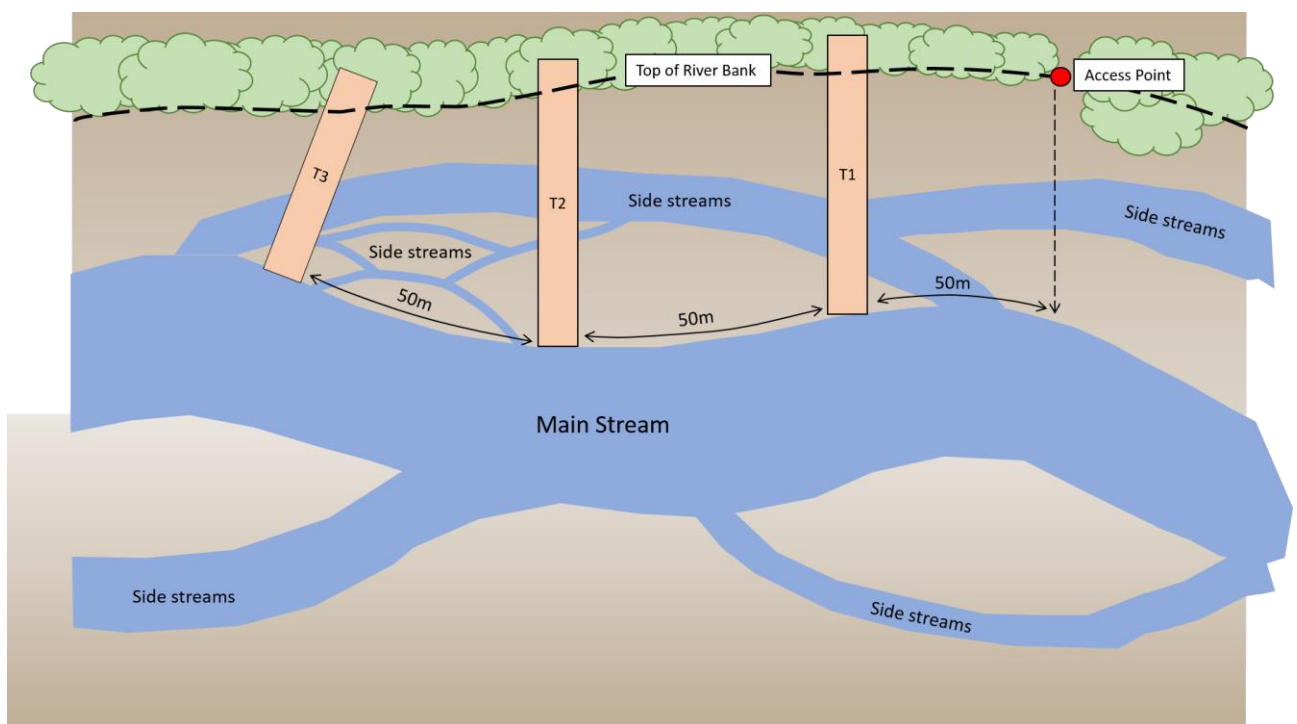
### Points to note:

- 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 ###. 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:	AH110	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

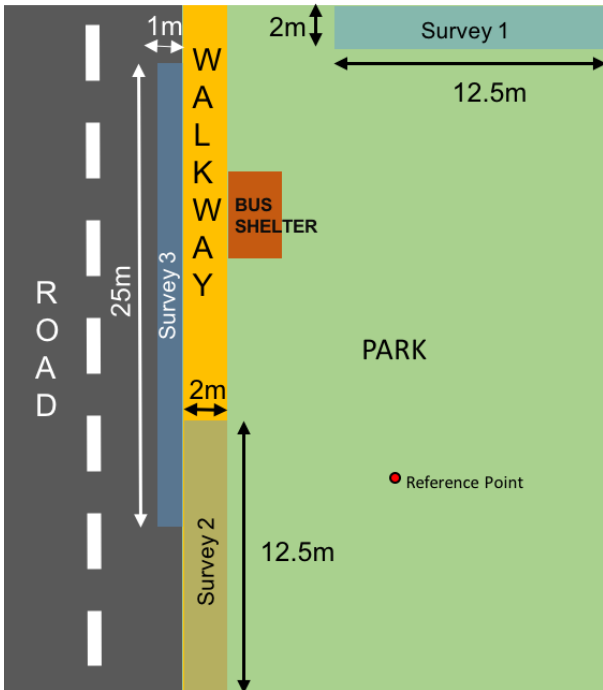
Site ID Code: <b>AH110</b>	Date: <b>16/01/2019</b>	Transect Number: <b>2</b> of <b>3</b>
Transect length (m): <b>25 m</b>	Transect width (m): <b>1 m</b>	Total No. of surveyors: <b>3</b>
Subsampled?    Y    N	Subsample measurement: <b>N/A</b>	Dimension of <b>each</b> subsample (e.g. 50cm x 200cm)

Transect Start:	Latitude: ..... <b>-42.5678° S</b> ..... Longitude: ..... <b>142.5678° E</b> ..... Start Time (00:00): ..... <b>09:30</b> ..... Photo numbers: ..... <b>P1278</b> .....	<i>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</i>
Transect End:	Latitude: ..... Longitude: ..... End Time (00:00): ..... Photo #/photog. name: .....	<i>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</i>
Type of transect:	Walkway    Car park <b>Roadway</b> School    Public transport Drain    Natural Veg.    Wetland    Park    Disused Ag/ pasture    Ag/ cultivated    Other (specify):	<i>Circle the best option to describe the type of land use of the transect area</i>
Slope/gradient:	A    B    C D    E <b>F</b>	<i>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 = &gt; 180cm (above head height)</i>
Vegetation height:	No vegetation <b>0 – 5cm</b> 5 – 50cm 50 – 100cm    100 – 200cm    >200cm	<i>Height of the vegetation in the transect area</i>
Substrate colour (if visible):	White / cream    Yellow    Orange    Brown <b>Black</b> Grey    Red	<i>Predominant colour of substrate (not vegetation)</i>
Percent (%) Bare ground	<b>100</b>	<i>How much of the transect area is bare ground (i.e. un-vegetated) (in 10% intervals)</i>
Percent (%) of area surveyed:	<b>100</b>	<i>If unable to survey the whole area what was sampled (in 10% intervals)</i>
Cleanliness <b>at first glance</b> :	No debris visible <b>Scattered debris visible</b> Lots of debris visible    Large amounts of dumped debris	
Evidence of dumping? (circle one or more)	<b>None</b> 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 <b>Storm or flood</b> High winds    Public event    Mowing	
Comments:		

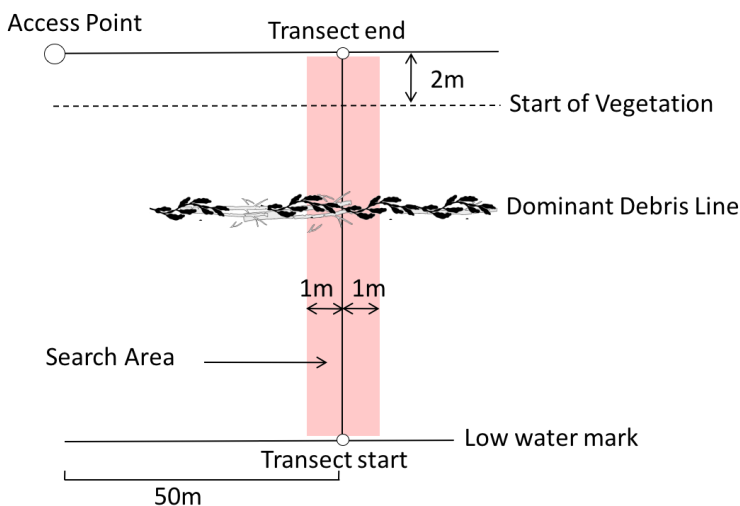
Name of data recorder: **John Jackson**

Name of person who entered data:

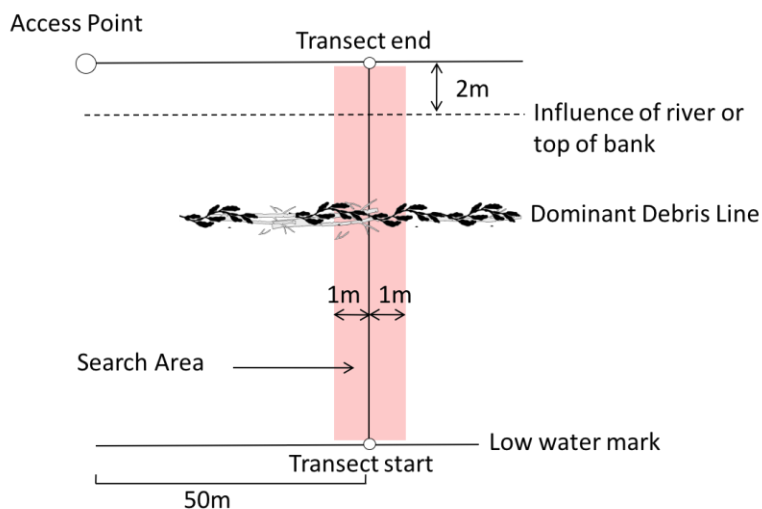
## How to lay out transects for Inland, River, and Coastal Sites



**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) <sup>26m</sup>	
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

- 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.
- 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.

- 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: AH110

Date: 16/1/19

No debris found

### ITEMS LIST

Transect No. 3 of 3

Page 1 of 1

Subsampled? Y **N**

ITEMS		ID	Fragment	Whole	ITEMS Cont.		ID	Fragment	Whole
Hard Plastic	Pipe/PVC	H1	HHH		Foam	Food container	D1		
	Beverage bottle <1 L	H2	+16+2	HHH		Cup/plates/bowls	D2		
	Other bottle	H3	HHH			Polystyrene	D4		
	Bottle cap/lid	H4				Unknown/other	D5	2	
	Food container	H5			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) <sup>26m</sup>	Dist. on tran	ID	Size class
1 0 - 2.6	0.5	Q3W	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: <i>AH110</i>	Date: 16/01/2019	Transect Number: <u>2</u> of <u>3</u>
Transect length (m): 25 m	Transect width (m): 1 m	Total No. of surveyors: 3
Subsampled? Y <input checked="" type="radio"/> N	Subsample measurement: N/A	Dimension of <i>each</i> 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.ddd) 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.ddd) 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

### Equipment for on the boat

1. Net
2. 3 x cod ends
3. Buckets (or something to put debris from tows in). You will need one bucket per tow, and there are three tows for each station, so bring at least 3 buckets per station that you plan to sample.
4. Datasheets – at least 3 per station
5. GPS (can be on mobile phone)
6. Camera (can be on mobile phone)
7. Smart phone with app to measure:
  - a. Windspeed/direction
  - b. Groundspeed
  - c. Compass

### Equipment for in the lab/sorting on shore

8. 4 x clear plastic tubs
9. Tweezers
10. Battery torch or flashlight

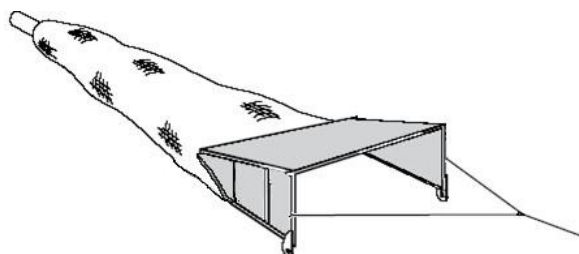
## 4.2 Methodology for deployment and use of surface trawl net sampling for marine debris

Note that these instructions cover three stages of trawl sampling:

- Before leaving land
- What to do on the boat
- How to sort samples back on land

### Before leaving land:

Remove the net from the bag and assemble. Make sure to check the net for holes and repair if necessary. The standard net used by CSIRO has a mouth size of 60 cm by 22 cm, 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.

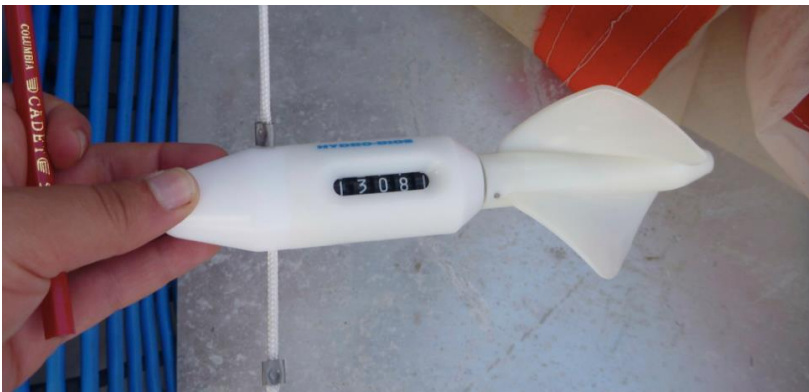


**On the vessel:**

1. Attach a cod end, making sure that it is clean of all debris.



2. Attach the flow meter. Check that the flow meter is turning freely.



3. Attach the tow rope to the net.



- Attach the other end of the tow rope to a point on the vessel so that when you put the net in the water it will be towed alongside the vessel, not behind the boat. If towing from a large boat you might need to put weights on the rope to keep the net from skipping across the top of the water.
- 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	<i>(e.g. river name, nearest city, etc)</i>	
Station Number	3		
Surveyor name and organisation	Jack Doe, CSIRO		
Date <i>(local; dd/mm/yyyy)</i>	16/10/2017		
Net type	CSIRO net		
Net mesh size	330 micron		
Net mouth dimensions	60cm x 22cm		
Salinity <i>(if known, ppt)</i>	35	Sea surface temperature (°C)	14.2

TOW DETAILS			
Tow Number	1	2	3
Wind speed <i>(true, kn)</i>	15		
Wind direction (degrees)	325		

- 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 cod end before you begin.
- Deploy the net over the side of the vessel and record start latitude and longitude and start time, in decimal degrees (dd.dddd). Make sure to write in the 5 digit number from the flow meter as well.

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

- Tow the net for approximately 15 minutes, while vessel is moving at a speed of 2-3 knots, then pull the net out of the water. The goal is to travel approximately one nautical mile (just under 2 kms).

\*\* You may just want to idle the boat once the first transect has been completed and as you prepare for the second and third transect.

- Record end latitude and longitude, end time, duration of tow, boat speed, direction, and depth, and flow meter end count on the data sheet.

<b>Start flow meter count</b>	13080		
<b>End latitude</b> (-S)	-42.9155		
<b>End longitude</b> (E)	147.4683		
<b>End time</b> (local / UTC)	13:35 local		
<b>End flow meter count</b>	13097		
<b>Average vessel speed</b> (ground, kn)	3		
<b>Average vessel direction</b> (degrees)	45		
<b>Average depth</b> (local, m)	14 m		
<b>Notes</b>	Lots of debris lines. Net picked up lots of algae.		

- 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, and attach a new, clean cod end.
- Repeat steps 5 to 10 for tow 2 and tow 3.
- 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.
- Once you have finished all stations, wash all gear thoroughly and leave to dry before packing back up in bag.

### Trawl sample sorting – WHEN YOU’RE BACK ON LAND

Sorting of the trawl samples occurs back on land, not in the boat. Note that you will be doing three separate sorts for each tow sample that you have done, so a total of 9 for each station.

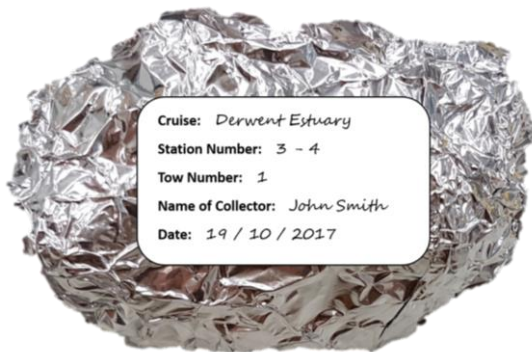
- Tip the contents of station 1 tow 1 into a clear plastic tub. Wash the cod end out into the bucket, making sure that the rinse water also goes into the bucket.
- Remove any natural/organic material such as seaweed etc. from the bucket, making sure there are no pieces of debris stuck to the organic material.
- Draw a grid on the bottom of a clear plastic petri dish.
- Using metal tweezers, remove all pieces of debris you see (using ambient light) and put them in the gridded petri dish.
- Tally the debris on the **Surface Trawl Collections** datasheet.
- Continue until you can’t find any more pieces

\*\*\*\*\* Take a 15min break \*\*\*\*\*

7. Do a second sort on the same sample by repeating steps 4 to 6.

\*\*\*\*\* Take a 15 min break \*\*\*\*\*

8. Do a third sort on the same sample by repeating steps 4 to 6, but this time use torch light (if available) to search for debris.
9. 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.
10. Once you have completed your 3 sorts for the tow or petri dish is full, take a photo, then empty contents into a piece of foil and label with station and tow number. Continue sorting debris into a petri dish if not completed.
11. Wrap all debris from station/tow in foil and label foil with:



- a. Cruise
- b. Station number
- c. Tow number
- d. Name of collector
- e. Date

12. Repeat for all tow samples

## Surface Trawl Collection Data

<b>Country</b>	Australia
<b>Location</b> (e.g. river name, nearest city, etc)	Derwent River
<b>Station Number</b>	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
<b>Hard plastic</b>	3	1	0						
<b>Soft plastic</b>	6	2	1						
<b>Plastic line / fibres</b>	1	0	0						
<b>Foam / Styrofoam</b>	3	0	0						
<b>TOTAL PLASTIC</b>	13	4	1						
<b>Photo details</b>									
<b>Notes</b>									

## 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<sup>2</sup>

**2** = 1–2 cm<sup>2</sup>

**3** = 2–4 cm<sup>2</sup>

**4** = 4–8 cm<sup>2</sup>

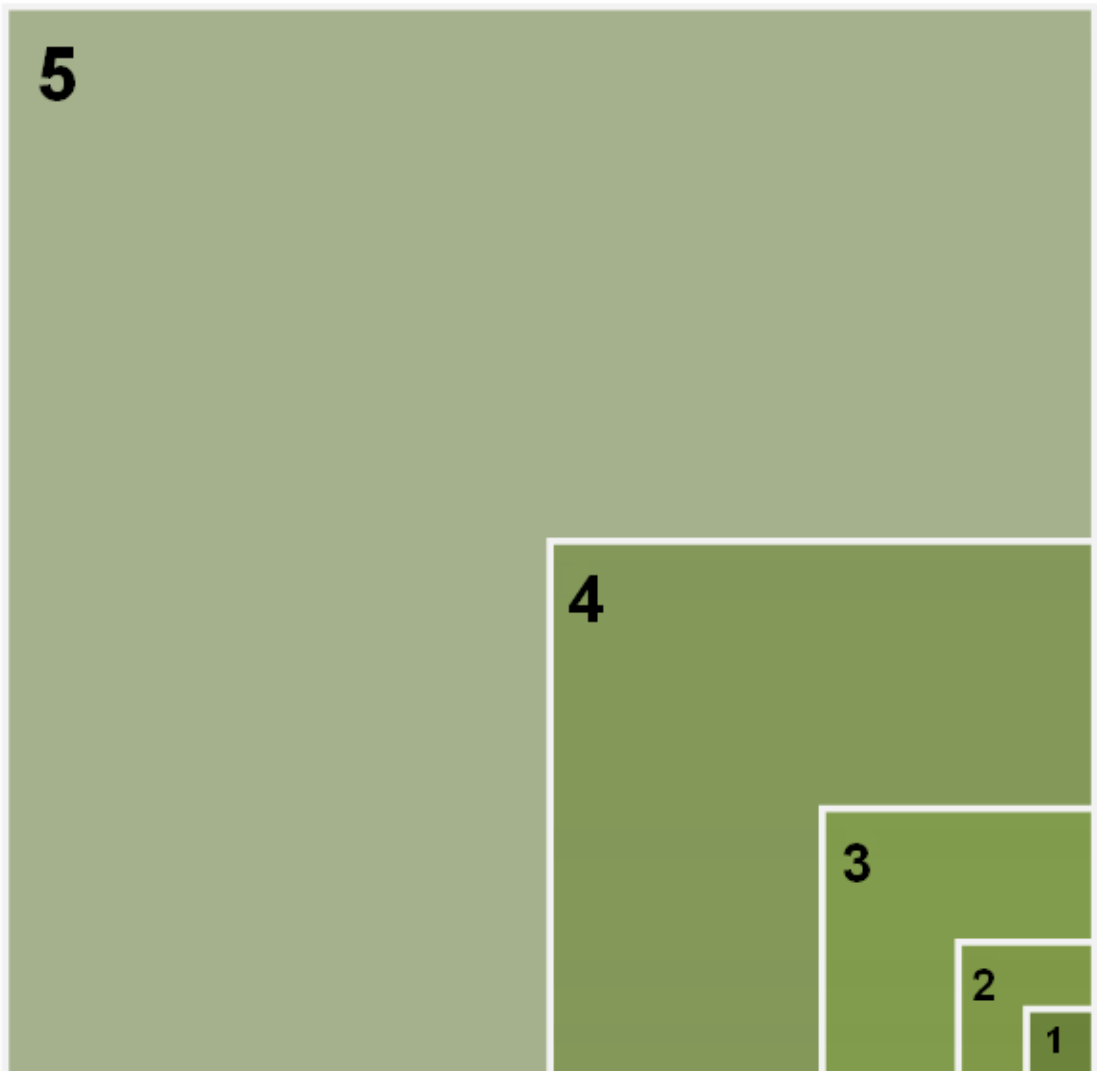
**5** = 8–16 cm<sup>2</sup>

**6** = 16–21 cm<sup>2</sup>

**7** = >22 cm<sup>2</sup>

↑  
← **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 4.1 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		
<b>SURVEYOR DETAILS</b>		
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.
<b>SITE DETAILS</b>		
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:	<input checked="" type="radio"/> Clear	<input type="radio"/> Rain/Storm	<input type="radio"/> Overcast	<input type="radio"/> 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	<input checked="" type="radio"/> 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	<input checked="" type="radio"/> side-on	side-off	sideshore	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:	<input type="text" value="Unknown"/>								If known.	
Access to site	<input type="radio"/> Paved	<input type="radio"/> Unpaved	<input checked="" type="radio"/> Trail		Other (specify):					
Trash cans or rubbish bins present?	<input checked="" type="radio"/> Yes		<input type="radio"/> No							
Cleanliness at first glance:	<input type="radio"/> No debris visible		<input checked="" type="radio"/> Scattered debris visible				<input type="radio"/> Lots of debris visible			
Evidence of dumping? (circle one or more)	<input checked="" type="radio"/> None		<input type="radio"/> Construction	<input type="radio"/> Household	Other(specify):					
Evidence of recent activities at site: (circle one or more)	<input type="radio"/> Storm or flood		<input checked="" type="radio"/> High winds		<input type="radio"/> Clean-up or removal of rubbish		<input type="radio"/> Apparent spilled trash or rubbish			
Comments:	<input type="text" value="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: <b>Dodges Ferry</b>	Date: <b>26/09/2017</b>	Transect Number: <u>  </u> of <u>  </u>
Transect length (m):	Transect width (m): <b>30 m</b>	Total No. of surveyors: <b>10</b>
Subsampled?    Y <b>(N)</b>	Subsample measurement: <b>N/A</b>	<i>Dimension of each subsample area (e.g. 50cm x 200cm)</i>

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

Name of data recorder: **John Jackson**

Name of person who entered data:

- 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: <u>  1  </u> of <u>  1  </u>
Transect length (m): 48 m	Transect width (m): 30 m	Total No. of surveyors: 10
Subsampled? Y <input checked="" type="radio"/> N	Subsample measurement: N/A	<i>Dimension of each subsample area (e.g. 50cm x 200cm)</i>



**Figure 4.2** The survey transect should run 2m into backshore vegetation

- 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.
- 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 4.3 below

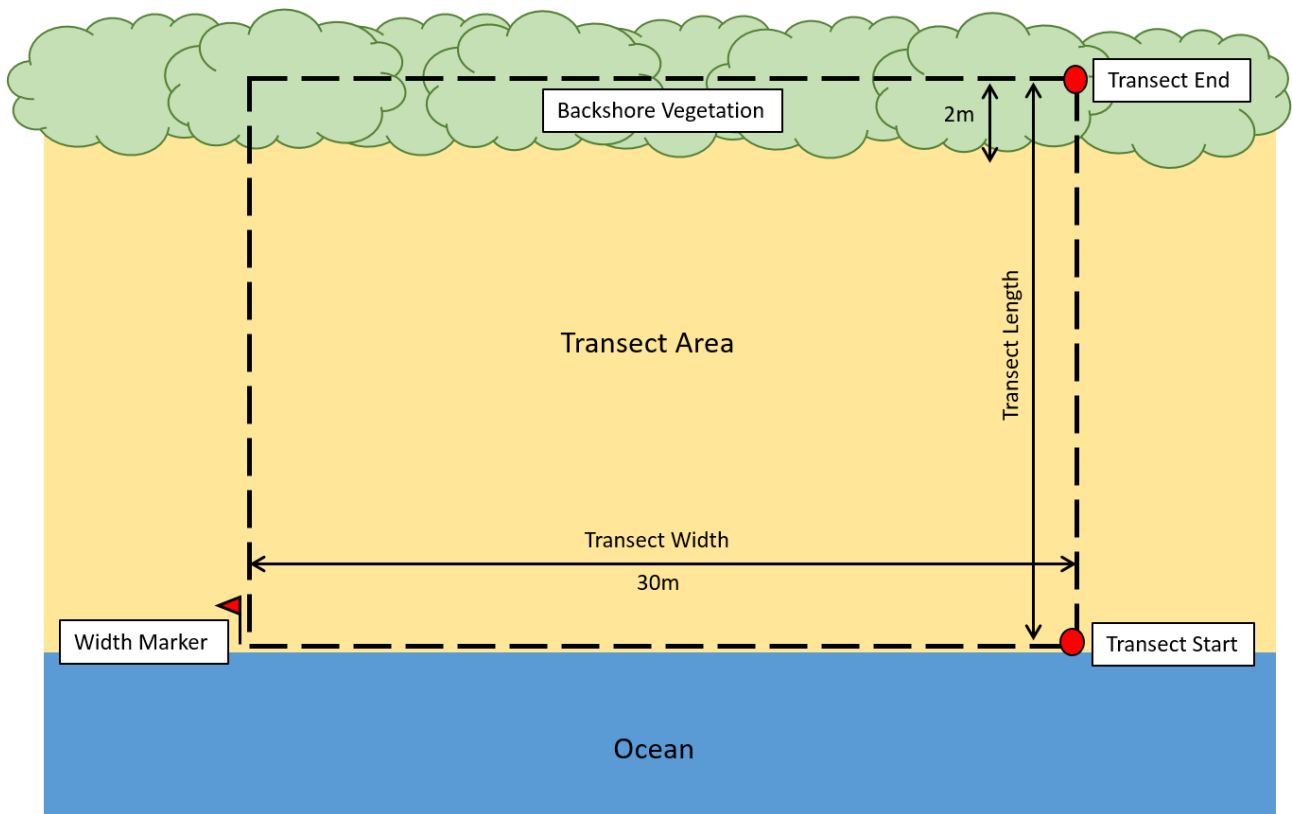


Figure 4.3 Diagram showing how to lay out a fixed area transect

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 4.4** 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.....	<i>Latitude and longitude recorded in decimal degrees (dd.dddd)</i>  <i>Record Start Time of Transect</i>  <i>Photographer name and number of photo, taken from transect start point</i>
Transect end:	Latitude: ..... Longitude: ..... End Time (00:00):..... Photo #/photog. name: .....	<i>Latitude and longitude recorded in decimal degrees (dd.dddd)</i>  <i>Record End Time of Transect</i>  <i>Photographer name and number of photo,, taken from transect end point</i>
Distance to dominant debris line (m):	<b>13 m</b>	<i>Distance from water edge to major debris line (in meters) at time of survey. If no obvious debris line use NA.</i>

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 28).
  - 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:		<i>Organisation responsible for survey</i>
Surveyor name:		<i>Name of data recorder</i>
Contact number:		<i>Contact number for data recorder</i>
Contact email:		<i>Contact email for data recorder</i>
Access point location:	Latitude: ..... Longitude: .....	<i>Latitude and longitude of access point where you enter the beach (dd.dddd). Ensure GPS is in WGS 84.</i>
GPS accuracy:		<i>Accuracy (metres) of GPS at time of reading.</i>

SITE DETAILS								
Location/Municipality		<i>Town location of site</i>						
Country:		<i>Country in which site was sampled</i>						
Survey date:		<i>Date survey undertaken (dd/mm/yyyy).</i>						
Site ID code:		<i>Site ID code (provided by CSIRO)</i>						
Site name:		<i>Unique name of site</i>						
Photo info:		<i>The name of photographer and photo #s from the site</i>						
Number of humans:	Time of day (00:00): ..... Visible distance (m): ..... No. of people: .....	<i>Number of people counted in the visible area measured by instantaneous count. Visible distance is length of shore with a clear and unobstructed view.</i>						
Current weather:	Clear    Rain/Storm    Overcast    Drizzle	<i>Circle best option to describe the weather.</i>						
Wind speed:	<table style="width: 100%; text-align: center;"> <tr> <td>0</td> <td>1</td> <td>2</td> </tr> <tr> <td>3</td> <td>4</td> <td>5</td> </tr> </table>	0	1	2	3	4	5	<i>0: calm (flat ocean)</i> <i>1: light breeze (wavelets, &lt;10km/h , &lt;6 knots)</i> <i>2: moderate breeze (small waves braking crests, 10-25km/h, 6-20 knots)</i> <i>3: strong breeze (waves and many white caps, 25-49km/h, 21- 26 knots)</i> <i>4: high wind (white caps and airborne spray, 50-65 km/h , 27-35 knots)</i> <i>5: gale (high waves, foam and spray present, 65-85 km/h, 35-45 knots)</i>
0	1	2						
3	4	5						
Wind direction: <i>(compass)</i>	N    NE    E    SE    S    SW    W    NW    N/A	<i>Direction from which wind is coming measured by the compass. N/A if no wind.</i>						
Wind direction: <i>(relative to shore)</i>	<table style="width: 100%; text-align: center;"> <tr> <td>onshore</td> <td>offshore</td> <td>sideshore</td> </tr> <tr> <td></td> <td>side-on</td> <td>side-off</td> </tr> </table>	onshore	offshore	sideshore		side-on	side-off	<i>Onshore: wind blowing towards shore</i> <i>Offshore: wind blowing towards sea</i> <i>Sideshore: wind blowing parallel to shore</i> <i>Side-onshore: wind blowing sideways and towards shore</i> <i>Side-offshore: wind blowing sideways and towards sea</i>
onshore	offshore	sideshore						
	side-on	side-off						
Date of last clean up:		<i>If known.</i>						
Access to site	Paved    Unpaved    Trail    Other (specify):							
Trash cans or rubbish bins present?	Yes    No							
Cleanliness <b>at first glance</b> :	No debris visible    Scattered debris visible    Lots of debris visible Large amounts of dumped debris							
Evidence of dumping? <i>(circle one or more)</i>	None    Construction    Household    Other(specify):							
Evidence of recent activities at site: <i>(circle one or more)</i>	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:	<i>Dimension of <b>each</b> subsample area (e.g. 50cm x 200cm)</i>

Transect start:	Latitude: ..... Longitude: ..... Start Time (00:00): ..... Photo #/photog. name: .....	<i>Latitude and longitude recorded in decimal degrees (dd.dddd)</i> <i>Record Start Time of Transect</i> <i>Photographer name and number of photo, taken from transect start point</i>
Transect end:	Latitude: ..... Longitude: ..... End Time (00:00): ..... Photo #/photog. name: .....	<i>Latitude and longitude recorded in decimal degrees (dd.dddd)</i> <i>Record End Time of Transect</i> <i>Photographer name and number of photo,, taken from transect end point</i>
Distance to dominant debris line (m):		<i>Distance from water edge to major debris line (in meters) at time of survey. If no obvious debris line use NA.</i>
Beach gradient:	A      B      C      D      E	<i>Difference in elevation from start to end of transect.</i> <i>A = &lt; 1 m (less than hip height)</i> <i>B = 1-2 m (hip to head height)</i> <i>C = 2-4 m (1-2 body length)</i> <i>D = 4-8 m (2-4 body lengths)</i> <i>E = &gt; 8 m (more than 4 body lengths)</i>
Substrate type:	Mud                  Sand                  Pebble / Gravel Boulders                  Rock slab                  Mangrove	<i>Major substrate type</i>
Substrate colour (if visible):	White / cream                  Yellow                  Orange                  Brown Black                  Grey                  Red                  Green	<i>Predominant colour of substrate (not vegetation)</i>
Backshore type:	Cliff                  Seawall                  Urban building Forest / Tree (> 3m)                  Shrub (< 3m)                  Dune Grass - tussock                  Grass - pasture                  Mangrove	<i>Physical structure of backshore, where beach meets terrestrial vegetation</i>
Shore exposure or shape:	Cove/bay                  Straight                  Headland	<i>Shape of beach where survey is conducted. Based on 50m each side of transect.</i>
Aspect:	N      NE      E      SE      S      SW      W      NW	<i>Direction when you are facing the water</i>
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:

## RIVER SITE INFORMATION

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

SITE DETAILS											
Location/Municipality		<i>Town location of site</i>									
Country:		<i>Country in which site was sampled</i>									
Survey date:		<i>Date survey undertaken (dd/mm/yyyy)</i>									
Site ID code:		<i>Site ID code (provided by CSIRO)</i>									
River name:		<i>Unique name of site</i>									
Photo info:		<i>The name of photog. and photo #s from the site</i>									
Dominant land use	Industrial      Residential      Commercial/Municipal Natural/Parkland      Agricultural      Roadway	<i>Circle best option to describe the dominant land use at the site</i>									
Number of humans:	Time of day (00:00): ..... Visible distance (m): ..... No. of people: .....	<i>Number of people counted in the visible area measured by instantaneous count. Visible distance is length of shore with a clear and unobstructed view.</i>									
Current weather:	Clear      Rain/Storm      Overcast      Drizzle	<i>Circle best option to describe the weather</i>									
Wind speed:	<table style="display: inline-table; border: none;"> <tr> <td style="padding: 0 10px;">0</td> <td style="padding: 0 10px;">1</td> <td style="padding: 0 10px;">2</td> <td style="padding: 0 10px;">3</td> <td style="padding: 0 10px;">4</td> <td style="padding: 0 10px;">5</td> </tr> </table>	0	1	2	3	4	5	<i>0: calm      3: strong breeze (25-49km/h, 21- 26 kn)</i> <i>1: light breeze (&lt;10km/h , &lt;6 knots)      4: high wind (50-65 km/h , 27-35 kn)</i> <i>2: mod. breeze (10-25km/h, 6-20 kn)      5: gale (65-85 km/h, 35-45 kn)</i>			
0	1	2	3	4	5						
Wind direction: (compass)	N    NE    E    SE    S    SW    W    NW    N/A	<i>Direction from which wind is coming measured by the compass. N/A if no wind.</i>									
Wind direction: (relative to shore)	onshore    offshore    sideshore    side-on    side-off	<i>Onshore: wind blowing towards shore</i> <i>Offshore: wind blowing away from shore</i> <i>Sideshore: wind blowing parallel to shore</i> <i>Side-on: wind blowing sideways and towards shore</i> <i>Side-off: wind blowing sideways and away from shore</i>									
Date of last clean up:		<i>If known</i>									
Access to river:	Paved      Unpaved      Trail      Other (specify):										
Trash cans or rubbish bins present?	Yes      No										
Cleanliness at first glance:	<table style="display: inline-table; border: none;"> <tr> <td style="padding: 0 20px;">No debris visible</td> <td style="padding: 0 20px;">Scattered debris visible</td> </tr> <tr> <td style="padding: 0 20px;">Lots of debris visible</td> <td style="padding: 0 20px;">Large amounts of dumped debris</td> </tr> </table>	No debris visible	Scattered debris visible	Lots of debris visible	Large amounts of dumped debris						
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)	<table style="display: inline-table; border: none;"> <tr> <td style="padding: 0 20px;">None</td> <td style="padding: 0 20px;">Clean-up or removal of rubbish</td> <td style="padding: 0 20px;">Apparent spilled trash or rubbish</td> </tr> <tr> <td style="padding: 0 20px;">Storm or flood</td> <td style="padding: 0 20px;">High winds</td> <td style="padding: 0 20px;">Public event</td> </tr> <tr> <td></td> <td></td> <td style="padding: 0 20px;">Mowing</td> </tr> </table>	None	Clean-up or removal of rubbish	Apparent spilled trash or rubbish	Storm or flood	High winds	Public event			Mowing	
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:	<i>Dimension of <b>each</b> subsample (e.g. 50cm x 200cm)</i>

Transect start:	Latitude: ..... Longitude: ..... Start Time (00:00): ..... Photo #/photog. name: .....	<i>Latitude and longitude recorded in decimal degrees (dd.dddd)</i> <i>Start Time of Transect</i> <i>Photographer name and number of photo, taken from transect start point.</i>
-----------------	---	--

Transect end:	Latitude: ..... Longitude: ..... End Time (00:00): ..... Photo #/photog. name: .....	<i>Latitude and longitude recorded in decimal degrees (dd.dddd)</i> <i>Record End Time of Transect</i> <i>Photographer name and number of photo, taken from transect end point</i>
---------------	---	--

Distance to dominant debris line (m):	<i>Distance from water edge to major debris line. If not obvious, use NA.</i>
---------------------------------------	---

Distance to top of bank (m):	<i>Distance from water edge to top of the bank</i>
------------------------------	--

Distance of river influence/erosion line (m):	<i>Height that water comes up the bank/erosion line</i>
---	---

River gradient:	A      B      C      D      E	<i>Difference in elevation from start to end of transect.</i> <i>A = &lt; 1 m (less than hip height),      B = 1-2 m (hip to head height)</i> <i>C = 2-4 m (1-2 body length)              D = 4-8 m (2-4 body lengths)</i> <i>E = &gt; 8 m (more than 4 body lengths)</i>
-----------------	-------------------------------	--

Bank type:	Mud      Sand      Pebble/Gravel      Cobble      Boulders Rock slab      Mangrove      Dirt bank      Vegetated      Cement	<i>Major substrate type</i>
------------	---	-----------------------------

Bank substrate colour (if visible):	White/cream      Yellow      Orange      Brown Black      Grey      Red      Green	<i>Predominant colour of substrate (not vegetation)</i>
-------------------------------------	---	---

Bank vegetation:	Grass/Reeds      Broadleaf/herb      Shrub (< 3m) Tree (> 3m)      Forest      None	<i>Circle the best option to describe the type of vegetation on the transect</i>
------------------	--	--

Vegetation height:	No vegetation      0 – 5cm      5 – 50cm 50 – 100cm      100 – 200cm      >200cm	<i>Height of the vegetation on the transect</i>
--------------------	---	---

Percent (%) Bare ground %	<i>How much of the transect is bare ground (i.e. unvegetated) (in 10% intervals)</i>
---------------------------	--

Percent (%) of area surveyed:	<i>If unable to survey the whole area, what was sampled (in 10% intervals)</i>
-------------------------------	--

Shore exposure or shape:	Cove / bay      Straight      Headland	<i>Shape of river where survey is conducted. Based on 50m each side of transect.</i>
--------------------------	--	--

Aspect:	N      NE      E      SE      S      SW      W      NW	<i>Direction when you are facing the water</i>
---------	--	--

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:

## INLAND SITE INFORMATION

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

SITE DETAILS								
Location/Municipality:		<i>Town location of site</i>						
Country:		<i>Country in which site was sampled</i>						
Survey date:		<i>Date survey undertaken (dd/mm/yyyy)</i>						
Site ID code:		<i>Site ID code (provided by CSIRO)</i>						
Site name:		<i>Unique name of site</i>						
Photo number/s and name of photographer		<i>The name of photographer and numbers of photos taken at the site</i>						
Dominant land use:	Industrial      Residential      Commercial/Municipal Natural/Parkland      Agricultural      Roadway	<i>Circle best option to describe the dominant land use at the site</i>						
Number of humans:	Time of day (00:00): ..... No. of people: .....	<i>Number of people counted in a 100 x 100m area</i>						
Current weather:	Clear      Rain/Storm      Overcast      Drizzle	<i>Circle best option to describe the weather.</i>						
Wind speed:	<table border="0" style="margin: auto;"> <tr> <td style="padding: 0 10px;">0</td> <td style="padding: 0 10px;">1</td> <td style="padding: 0 10px;">2</td> <td style="padding: 0 10px;">3</td> <td style="padding: 0 10px;">4</td> <td style="padding: 0 10px;">5</td> </tr> </table>	0	1	2	3	4	5	<i>0: calm</i> <i>1: light breeze (&lt;10km/h , &lt;6 knots)</i> <i>2: mod. breeze (10-25km/h, 6-20 kn)</i> <i>3: strong breeze (25-49km/h, 21- 26 kn)</i> <i>4: high wind (50-65 km/h , 27-35 kn)</i> <i>5: gale (65-85 km/h, 35-45 kn)</i>
0	1	2	3	4	5			
Wind direction: (compass)	N      NE      E      SE      S      SW      W      NW      N/A	<i>Direction from which wind is coming measured by the compass. N/A if no wind.</i>						
Date of last clean up:		<i>If known</i>						
Access to site:	Paved      Unpaved      Trail      Other (specify):							
Trash cans or rubbish bins present?	Yes      No							
Cleanliness <b>at first glance</b> :	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:	<i>Dimension of <b>each</b> subsample (e.g. 50cm x 200cm)</i>

Transect Start:	Latitude: ..... Longitude: ..... Start Time (00:00): ..... Photo #/photog. name: .....	<i>Latitude and longitude recorded in decimal degrees (dd.ddd)</i> <i>Ensure GPS is in WGS 84</i>  <i>Record Start Time of transect</i>  <i>Photographer name and number of photo, taken from transect start point</i>
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Transect End:	Latitude: ..... Longitude: ..... End Time (00:00): ..... Photo #/photog. name: .....	<i>Latitude and longitude recorded in decimal degrees (dd.ddd)</i> <i>Record End Time of transect</i>  <i>Photographer name and number of photo, taken from transect end point</i>
---------------	---	---

Type of transect:	Walkway      Car park      Roadway      School      Public transport Drain      Natural Veg.      Wetland      Park      Disused Ag/ pasture      Ag/ cultivated      Other (specify):	<i>Circle the best option to describe the type of land use of the transect area</i>
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Slope/gradient:	A      B      C  D      E      F	<i>Difference in elevation from start to end of transect.</i> <i>A = Flat (no difference)      B = 5-50cm (ankle to knee height)</i> <i>C = 50-100cm (knee to hip)      D = 100-150cm (hip to chest)</i> <i>E = 150-180cm (chest to head)      F = &gt; 180cm (above head height)</i>
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Vegetation height:	No vegetation      0 – 5cm      5 – 50cm 50 – 100cm      100 – 200cm      >200cm	<i>Height of the vegetation in the transect area</i>
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Substrate colour (if visible):	White / cream      Yellow      Orange      Brown Black      Grey      Red	<i>Predominant colour of substrate (not vegetation)</i>
--------------------------------	--	---

Percent (%) Bare ground		<i>How much of the transect area is bare ground (i.e. un-vegetated) (in 10% intervals)</i>
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Percent (%) of area surveyed:		<i>If unable to survey the whole area what was sampled (in 10% intervals)</i>
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Cleanliness <b>at first glance</b> :	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:
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Name of data recorder:

Name of person who entered data:

Name of observer:





Date:

No debris found

Transect No. \_\_\_\_ of \_\_\_\_

Subsampled? Y N

ITEMS		ID	Fragment	Whole	ITEMS Cont.		ID	Fragment	Whole
Hard Plastic	Pipe/PVC	H1			Foam	Food container	D1		
	Beverage bottle <1 L	H2				Cup/plates/bowls	D2		
	Other bottle	H3				Polystyrene	D4		
	Bottle cap/lid	H4				Unknown/other	D5		
	Food container	H5			Paper	Cigarette/butt	P1		
	Utensil/plate/bowl	H6				Paper/cardboard	P2		
	Bucket/Crate	H7				Magazine/newspaper	P3		
	Lighter	H8				Bag	P4		
	Lollipop stick/earbud	H9				Box	P5		
	Unknown/other hard	H10				Food container/box	P6		
				Food wrapper/bag		P7			
Soft Plastic	Thin film carry bag	S1			Beverage container	P8			
	Food wrapper/label	S2			Cups	P9			
	Sheeting	S3			Plates/bowls	P10			
	Cup/lid	S4			Unknown/other	P11			
	Straw	S5			Fishing	Net	F1		
	Unknown/other soft	S6				Fishing line	F2		
	Other plastic bag	S7				Fishing Lures	F3		
Plastic Straps	String/rope/ribbon	BP1				Buoys/floats	F4		
	Packing strap	BP2				Glow stick	F5		
	Cable ties	BP3				Fishhook/sinker	F6		
	Unknown/other strap	BP4				Unknown/other	F7		
Metal	Pipe	M1			Miscellaneous	Battery	Z1		
	Wire	M2				Brick/cement	Z2		
	Aerosol	M3				Carpet	Z3		
	Beverage can	M4				Ceramic	Z4		
	Food can/tin	M5				E Waste	Z5		
	Lid/cap	M6				Furniture	Z6		
	Food wrapper	M7				Appliances	Z7		
	Aluminium foil	M8				Large car parts	Z9		
	Bucket/drum	M9				Large boat parts	Z10		
	Unknown/other hard	M10				Bag/box dom. waste	Z11		
	Unknown/other soft	M11				Nurdles	Z12		
Glass	Beverage bottle	G1				Other		O1	
	Jar	G2					O2		
	Light globe/tube	G3					O3		
	Unknown/other glass	G4					O4		
Rubber	Thong/shoe	R1					O5		
	Tyre	R2					O6		
	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							

**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			<i>(e.g. river name, nearest city, etc)</i>
Station Number			
Surveyor name and organisation			
Date <i>(local; dd/mm/yyyy)</i>			
Net type			
Net mesh size			
Net mouth dimensions			
Salinity <i>(if known, ppt)</i>		Sea surface temperature (°C)	

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

## Surface Trawl Collection Data

Country	
Location ( <i>e.g. river name, nearest city, etc</i> )	
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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