

How To Conduct A River Cleanup

This method uses the National Oceanic and Atmospheric Administration (NOAA) Marine Debris Shoreline Survey Field Guide by Sarah Opfer, Courtney Arthur, and Sherry Lippiatt as its source, with a few important alterations. See Notes on this method in the next section for further details. We also apply the method to a river ecosystem instead of a beach environment.

Preparation before the event

1. If your river levels fluctuate daily due to tidal influence, read tidal charts to determine when it will be low tide in your area. If applicable, your cleanup should begin at low tide. In many cases, rivers will not be tidally influenced. In this case, the ideal clean up time will be after seasonal rains when water levels have receded.
2. If possible, select a time when temperatures are cooler to allow for a safe and healthy cleanup. For most locations, early morning is the ideal time. Nighttime cleanups should not be conducted.
3. Unlike a beach cleanup, it will be important to wear boots or other protective footwear to a river cleanup, as venomous wildlife might be present.
4. **Select a site.** Unlike a local beach with which you're familiar, you may need to scout out river sites before the event to find the best one. The ideal site will have 100 contiguous meters of bank along the riverside that isn't blocked by walls or other insurmountable objects. It will have a bank (i.e., not a hard wall as its edge), and it will not be too steep. Participants should be able to walk up to the river's edge and pick up debris from the ground.
5. Schedule a clean up event. If open to the public, share times and location with potential volunteers. Inform participants they should wear boots or protective boots, hats, sunscreen, bring refillable water bottles, and protect themselves from the elements.
6. Ensure the following equipment is available
 - a. Gloves. River litter is not clean. Plastic debris in aquatic environments both breaks down chemically and attracts chemicals to it. Participants should avoid touching debris with their bare hands. Provide reusable gloves when possible.
 - b. Measuring tape (50 Meter minimum length).
 - c. Survey flags to mark the perimeter of the collection site.
 - d. Cloth, recycled, or reused bags to collect material
 - e. Luggage scale
 - f. Coolers or large containers of water (avoid single use plastics)

On the day of the cleanup event:

1. Remind participants again to wear boots or protective shoes, hats, sunscreen, to bring refillable water bottles, and to protect themselves from the elements
2. Warn participants to avoid picking up dangerous items including sharp glass, hypodermic needles, and very heavy objects. **Ask participants to find a group leader to pick up these items.**

3. Remind participants to drink plenty of water and to find shade if they feel tired or light headed.
4. Mark off the area, 100 meters along the length of the river, and then flag off an area five meters in depth from the bank.



Figure one: How to determine the perimeter of your site

5. Use a smart phone or GPS unit to collect GPS data on the four corners of the cleanup area.
6. Post flags at 10-meter increments along the 100-meter long stretch to guide collection efforts.
7. Spread participants out across the space, evenly divided among the 10-meter increments. Each group of participants should have a bag to enable collection. Participants should walk in a line slowly and methodically along their lane, scanning the ground carefully from left to right as they take steps.
8. Just like with a shoreline cleanup—participants shouldn't be wading into water or collecting water-based debris. Participants instead are collecting the debris that has made its way to the river's edge or shoreline.
9. Participants should pick up all material not naturally distributed. In other words, even if something is biodegradable but was left by humans, it should be collected (temple flower garlands, banana leaves for serving food, coconuts used by humans, pieces of lumber). Other natural materials not left by humans can be left behind.

10. Participants should put all found materials in their sacks. Participants should feel free to photograph the collection process and even post to social media including hashtags like #river #debris #litter #plastic #pollution #waterways #environment #sustainability #NEIEM and location, country, river name, NGO or institution name where applicable, etc.
11. After cleaning the area, participants should take a group photograph and tally up the total number of bags
12. All bags should be taken to a second location for sorting, classifying, weighing, and counting

Sorting, Classifying, Weighing, and Counting

1. You can divide and weigh the material immediately or let it dry for a few days first. In either case, simply note whether the weight is dry or wet in any subsequent reports.
2. First divide the material into broad categories by using buckets or piles. Use the printable signs on the webpage to mark the different broad categories.
 - a. Plastic
 - b. Metal
 - c. Glass
 - d. Rubber
 - e. Processed Trees
 - f. Cloth, Fabric, Shoes
 - g. Mixed Materials
 - h. Natural Materials Used By Humans
 - i. Other
3. Once this sorting is complete, weigh each broad category. Use the Data Sheets for this purpose.
4. Then sub-divide the categories according to the classifications on the Data Sheets. Please note these are a modification of those by Opfer, Arthur, and Lippiatt (2012).
5. In some cases you may be unsure which category best fits a piece of debris. You will have to make a decision based on your own assessment. Just be consistent in any choice you make and make a note of it. After sub-dividing the categories, you should count the total number of pieces in each. You should also weigh sub-categories. Use the Data Sheets for this purpose.

Your cleanup and classification are now complete!

Notes on the collection method

This method uses the National Oceanic and Atmospheric Administration (NOAA) Marine Debris Shoreline Survey Field Guide by Sarah Opfer, Courtney Arthur, and Sherry Lippiatt as its source, with a few important alterations. This 2012 resource (available from www.marinedebris.noaa.gov) describes two types of shoreline surveys: Accumulation and Standing Stock.

Accumulation study

In an accumulation study via the Opfer, Arthur, and Lippiatt (2012) method, the expectation is that debris will be removed from “the entire length of the shoreline during each site visit” (p. 1). As such, an accumulation survey by this method will include periodic cleanups, measuring the deposition of debris at a given site over time (Opfer, Arthur, and Lippiatt, 2012). This type of survey may also be used to determine types of debris and debris weight (Opfer, Arthur, and Lippiatt, 2012). Depending on the depth of the beach, this type of survey may require a large number of volunteers and many hours.

Standing Stock study

The other option described by Opfer, Arthur, and Lippiatt (2012) is a standing stock study, in which participants survey a 100-meter long stretch of beach to determine debris density (Opfer, Arthur, and Lippiatt, 2012). This type of survey requires less time but there is an expectation that debris will not be removed during the analysis. There is also an expectation that the researchers will return periodically to the site to measure density, shedding light on how density may change over time.

Our modified method combines these methods, surveying a 100-meter length of beach in the inter-tidal zone at low tide to understand the density of a given area and the composition of debris. In addition, our method incorporates a brand analysis of the resulting debris.