



## STRATEGIC PLANNING FRAMEWORK FOR SHORELINE CLEANUP



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### Introduction

This strategic framework provides an overall structure and instruction in how to comprehensively plan a cleanup for rural and urban areas. It is expected that this document will be refined to include detailed information specific to each community and geography. The purpose of this document is to outline the required key components of a strategy to achieve safe and effective cleanup events.

Objective: To offer a team building opportunity and experience that will aid in keeping shorelines clean while reducing the environmental impact resulting from accumulations of routine and small debris items (i.e., pieces of plastic, food containers, water bottles, fish gear, etc.).

Project overview:

Participants will collect and consolidate shoreline debris material into reusable bags such as burlap sacks and possibly 1-tonne 'super sack' agriculture bags in preparation to transport for sorting of material to be recycled, upcycled or landfilled.

This strategic planning framework aims to:

- To enhance efforts in creating a cleaner planet by the consistent removal of shoreline litter
- Outline considerations for planning, implementation, and closure for shoreline cleanup events
- Improve the safety and coordination for participants conducting a cleanup
- Outline potential site hazards, accessibility concerns, and waste volume metrics
- Outline permit, regulation and stakeholder engagement requirements
- Health and safety planning
- Provide technical advice on how to conduct shoreline cleanups with partners and stakeholders in a safe, efficient and effective manner
- Increase the understanding of marine debris reuse, recycle, upcycle and disposal options, as well as outline protocols for managing the marine debris end-of-life
- Monitoring options for debris accumulation through existing shoreline monitoring programs
- Outline the importance of public education to develop capacity while promoting action-oriented awareness of the issues and future cleanup activities

## **Section 1: Pre-Cleanup Planning**

Planning a shoreline cleanup will depend on many elements including timing, site selection and resource availability. When selecting a site for a cleanup, one must consider the various factors outlined below.

### **1.0 Season**

For fresh water lakes, rivers and ocean shoreline environments, it is important to select locations when the weather is favourable. The change in seasons will bring conditions which include snow, heavy rain, strong winds, flooding, extreme king tides and other climatic variables that will be important in your planning.

### **1.1 Water Hazards – Ocean, River and Lake Environments**

Shoreline cleanups occur around ocean, river, streams, lake and pond environments. Depending on the type of waterbody, will determine what water hazards need to be considered when preparing for a shoreline cleanup. A common hazard that exists for all of these environments when cold water is present is hypothermia. This is a medial state when the body loses heat faster than it can be produced. Coordinators need to be aware of the signs and symptoms of hypothermia and how to address this condition. Additional hazards for ocean, river and lake environments are outlined below.

#### **1.1.1 Ocean Environments**

There are a variety of hazards to consider when amongst coastal environments, such as tides, large waves, rolling drift logs, storm surges, and even tsunamis.

Beaches and shorelines around the world can be exposed to the open ocean where waves (also known as swell) are influenced by tides, currents, and weather, such as winds and storm systems. Ocean conditions may be altered rapidly resulting in wave action. Large waves can be unpredictable as they sweep over beaches and rocky shorelines, resulting in logs to drift and roll and areas to flood. Even in favourable seasons, ocean tides are an important factor to incorporate in your planning. Tides can come into shorelines unexpectedly quickly, which can isolate rocks from headlands. With tides going in and out twice a day, shoreline conditions resulting from this fluctuation can range from a few centimetres to over several metres. Plan all activities according to the tides, watch for rising tides and ensure adequate time to return safely.

High tides can also move drift logs resulting in them to roll and float. Be aware of drift log movement as it can knock you off your feet, roll onto you or trap and crush you. Drift logs can also be extremely slippery during rain and frost events.

Storm surges occur when the water rises and coastal areas become flooded. These events occur from large storm systems which are affected by atmospheric pressure changes, strong winds, increased rainfall, the effects of waves near the shore, and large tides during new and full moons.

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Coordinators are to check weather forecasts to ensure a storm event is not predicted during the cleanup event.

Tsunamis are a series of large waves due to a significant disturbance of a water body generally caused by earthquakes, and occasionally caused by nearshore and underwater landslides and volcanoes. Tsunamis are rare events but are very dangerous. Ensure planning incorporates evacuation routes, so if shaking is felt or if the water abruptly exceeds, cleanup teams know where to move immediately to higher ground (greater than 15 metres or 45 feet above the tide line).

TIP:

\* Reference a tide table, swell forecast and a wave hazard rating prior to your event - Know Before You Go!

### 1.1.2 River Environments

River environments are constantly changing resulting in unpredictability and unseen hazards. The flow of currents in a river system can be very powerful even if the water is slow moving. Strong currents, undertows, rapids downstream, tidal changes, and suction effects can create the water to be faster than it looks. Furthermore, river banks may be eroding and can become flooded and unstable. It is recommended that participants stay at least 5 metres back during a shoreline cleanup along unstable riverbank environments. Coordinators must check weather forecasts prior to a cleanup to learn if rain is predicted. If so, it is recommended to conduct a site assessment prior to the event to ensure it is safe as rain events can cause river levels to change resulting in increased hazards such as fast flowing debris, and unstable banks. Loosing your footing if walking too close to the waters edge may result in falling into the river and being swept away, a potentially hazardous situation where injury or death is an outcome.

TIP:

\* Never underestimate the power of currents and remain 5 metres back during a riverine shoreline cleanup with unstable bank or environments.

### 1.1.3 Lake Environments

Lakes environments can have a variety of natural hazards to consider prior to a cleanup event. Lake water levels can fluctuate causing flooding, particularly if there is runoff from upland sources, severe storms, storm surges, shoreline erosion, and in the rare event a landslide. Site assessments prior to a clean up are recommended to identify any potential lake hazards.

## 1.2 Site Reconnaissance

Site reconnaissance is crucial. Have your cleanup coordinator visit potential sites well before the event. Understanding the accessibility and transportation requirements to and from a site are fundamental with planning shoreline cleanup. It is also important that the shoreline is surveyed to prepare recommendations and solutions for sorting, recycling, reusing materials, possible temporary storage, efficient transportation, and disposal for debris.

### **1.3 Identify Site Hazards**

By determining shoreline characteristics such as gradient and vegetation, you will learn if the site consists of potential natural hazards or obstacles (i.e., drift logs, jagged rocks, steep areas, large boulders, prickly shrubs, etc.). This information will be crucial to provide to participants to ensure they bring appropriate personal protective equipment required for the site. Once hazards and risks are identified, a site-specific safety plan, including an evacuation plan can be tailored.

### **1.4 Identify Shoreline Topography**

When surveying a site, it is important to factor the topography of a shoreline. For example, a shoreline gradient plays a key role when identifying “hotspots” or areas of high plastic concentration. Shorelines that have a steeper gradient result in plastics and other marine debris to roll and tumble back into the water column i.e., steeper shorelines in remote areas where populations do not directly pollute may result in less pollution. When the shoreline gradients become less steep, and possibly contain rocks, boulders and drift logs, materials can get combed from the water column resulting in becoming trapped and accumulated on to shorelines

### **1.5 Identify Accessibility and Transportation Requirements**

During the initial visit (s) to a potential cleanup location, keep in mind accessibility and transportation requirements for participants, as well as how the materials collected will be removed.

#### **1.6 Road Access**

When appropriate, group travel by van or bus when accessing a site by road is recommended. This will reduce parking concerns and reduce the carbon footprint for the event. It is also recommended to limit air transport for these events to support the balance of carbon emissions with carbon removal.

When applicable, work with Gold Standard companies on reporting carbon neutrality. Ensure ground transportation requirements are considered well before the cleanup to ensure all agreements and approvals are established.

#### **1.7 Water Access**

If the site is accessed by water, consider potential hazards and safe anchorage. Identifying various safe anchorage locations will be required in case of poor weather conditions or for an emergency incident. Ensure marine travel requirements are considered well before the cleanup to ensure all agreements, approvals, insurance and liability obligations are met.

#### **1.8 Foot Access**

If the site is accessed by foot, consider the possible increased timeline required to go to and from the site. Climatic and geographical factors (e.g., rain, high temperatures, steep hills) may provide

challenges for participants.

### 1.9 Identify Waste Composition and Material Volume Estimates

Site reconnaissance also enables you to identify waste composition and rough material volume estimates. This will be imperative when considering options for marine debris end of life management. A preliminary survey can initiate potential necessary steps required to separate and sort, recycle and upcycle the materials, such as agreements with your selected recyclers, as well as how to coordinate the transportation for the volume that may be collected.

It is recommended that when visiting a site, to keep in mind the potential impact for disposal capacity within that area. The volume of material can be categorized into three levels – low, moderate or high. Low-impact volumes are likely within a normal range of a solid waste system, while moderate-impact volumes should signal for special concern actions and consultation with appropriate authorities. It is advised to restrict shoreline cleanup for areas within the high-impact volume range. These sites should be shared with appropriate agencies where strategies and options for debris management can be established. Table 1 outlines the three volume levels of impact to solid waste systems.

Table 1. Disposal capacity considered at three levels – low, moderate or high

<ol style="list-style-type: none"><li>1. <b>LOW-IMPACT:</b> An increase in solid waste volumes ranging between 1% to 5% or less as a result of marine debris collection.</li><li>2. <b>MODERATE-IMPACT:</b> An increase in solid waste volumes ranging between 5% to 25% as a result of marine debris collection.</li><li>3. <b>HIGH-IMPACT:</b> A substantial increase in solid waste volumes ranging between 25% to 50% or more as a result of marine debris collection.</li></ol>
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Site reconnaissance and assessments of onshore debris may result in specialized disposal protocols. See Post Cleanup details in section 3 for more information on specialized disposal options.

### 1.10 Assemble Cleanup Teams

Each cleanup team should consist of a team coordinator, also known as a “lead” and a safety officer (it is acceptable for the team coordinator/lead to also be the safety officer) that is supervised by a project manager. Prior to the cleanup event, it is important to ensure adequate personnel and equipment are available to effectively organize a cleanup of a particular shoreline to ensure characteristics such as size, hazards and debris volumes are considered i.e., site selection will largely depend on resource availability.

It is recommended that all participants are fit and healthy. Children are permitted on cleanups under special circumstances (i.e., additional waivers, adult supervision, cleanup event for school groups, etc.).

Prior to a clean up, it is recommended that the coordinator provides a welcome to participants and thanks everyone for partaking in the event. During this short talk it is relevant to explain the



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purpose of the event, as well as review all safety details and site instructions. This is when the coordinator needs to ensure all waivers and forms are signed and provided. This is also when participants are divided into small teams and cleanup supplies are distributed.

Please ensure that there is a translator if coordinators do not speak the same language as the cleanup participants.

### **1.11 Identify Cleanup Timeframe**

Shoreline cleanups can vary from a few hours to several days. To determine the timeframe, it is important to review the goals and objectives for each cleanup event, as well as, resource availability and site location. Supplementary planning is required when overnighing by means of camping or group lodging which occurs at cleanup locations.

Inherently, your cleanup will require extra time, potentially days, if the selected shoreline is remote in nature. Please plan accordingly.

### **1.12 Media Relations**

Your cleanup coordinator will want to reach out to any local media sources to inform them of the event. This will help you spread the word of your event and help you attract volunteers to the cleanup. This will also help you plan having media present during the day of the cleanup.

A social media strategy may be something to consider to get the messaging out before, during and after a cleanup. Participants may be keen to share their photos. With social media terminology and hashtags devised, participants will be able to assist with promoting future events.

TIP:

\* Having media present on the day of event will help capture the positive impact your cleanup is having in the community and may assist in developing future community relations.

## **2.0 Permission and Permits, Indigenous Relations, and Stakeholder Engagement**

### **2.1 Permission and Permits**

Prior to a cleanup event, it is critical to connect with appropriate First Nations and Indigenous groups, government agencies, private and commercial landowners, tenure holders, as well as understand procedures established for park areas or other tenured lands. All shoreline cleanup activities should respect landowner's property rights and arrangements should be put in place to address risks associated with cleanup activities. Items to consider are outlined below.

- Determine overall shoreline jurisdiction for nearshore, foreshore and backshore zones;
- If the land owner or tenure holder is in agreement
- If there are regulatory, insurance or liability issues to address and agreements or permits to obtain

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- If there are restrictions or processes for shoreline use

### TIP

\* Get started right away. This is an important first step once a site location has been identified as permit applications and stakeholder relations / engagement can be a lengthy process.

### **2.2 Indigenous Relations**

Key local partners in collective efforts to address marine debris are Indigenous groups, such as treaty and non-treaty First Nations. Regardless of land title and ownership, it is important to involve indigenous groups to respect traditional territories, culture, beliefs and local knowledge.

### **2.3 Stakeholder and Partner Engagement**

It is recommended to collaborate on all aspects of a cleanup event with potential stakeholders and partners. Collaboration with these groups can support relationship development, efficient and effective cleanup events, and capacity development for future events and long-term programming. Potential aspects to review with cleanup stakeholders and partners are outlined below.

- Identify existing programs
- Development of best practices and sustainable solutions for handling debris, with a focus to prevent debris from entering the landfill stream
- Establish assets, resources, equipment, supplies and contact lists available for joint cleanups with stakeholders and partners
- Identification of protocols, partnerships and procedures necessary for remote or hard to access cleanups, including handling of unique and materials
- Confirm priority areas and access routes
- Co-ordination of clean-up events
- Joint protocols to identify, collect and inventory unique marine debris
- Local (county), regional, provincial (state) and federal (national) government collaboration to determine appropriate reporting protocols and agreements
- Establishment of a financial tracking/monitoring system
- Public outreach opportunities and community leadership for sustainable long-term programming

### **2.4 Public Outreach and Local Engagement**

The success of marine debris management is based on the level of involvement from the public, such as concerned community members, school groups, politicians, associated organizations and businesses, etc. It is not only important to engage with local groups to outline the intent of the cleanup, but to ensure there is not overlap with other cleanup groups and events. Developing local engagement and public outreach campaigns, such as adopt-a-beach program or community-based stewardship programs, can be established for the sites that have been cleaned. This will ensure continuous upkeep of these areas.

### **3.0 Health and Safety**

#### **3.1 Safety Planning**

Safety is the top priority for all cleanup events. All supporting agencies, stakeholders and volunteers performing shoreline cleanups will keep safety as a primary concern as it is a shared responsibility. The project manager, coordinator(s), and safety officer(s) will provide overall site safety and technical support to participants.

Participants will be working near aquatic environments and may at times travel to site locations by boat. Daily weather, marine forecasts and/or riverine conditions will be provided to participants along with a relevant safety briefing that includes a tailboard safety form. The project manager and coordinator(s) will be responsible for assessing specific hazards on shore (e.g., slippery rocks) and avoid or direct participants to mitigate risk. These team leaders will ensure participants are appropriately dressed for weather and will continuously monitor the group to ensure health and safety. Groups will adhere to the buddy system at all times.

When developing a health and safety plan, you must:

- Identify the local work safe regulation(s) which determines the amount of first aid personnel and skill level required per number of participants you are expecting
- Identify hospitals or clinic locations
- Develop an Emergency Evacuation Plan due to injury or unexpected environmental conditions
- Identify safety risks such as wild animals and have a protocol in place to explain to participants

The project manager, coordinator(s), and safety officer(s) should wear a reflective vest during shoreline cleanups, so they can easily be identified during cleanup activities.

If participants are traveling on a marine vessel, the boat operator will be responsible for assessing risks at specific pickup and drop-off locations. All cleanup participants must follow the instructions of the boat operator. Exit and enter to a vessel must have the permission and direction of the boat operator. Lifejackets must be worn at all times by participants while onboard the vessel, unless otherwise instructed by the vessel operator.

#### **3.2 Cleanup Safety Precautions**

When conducting shoreline cleanups, all participants will follow and abide to the basic safety precautions outlined below. Participants will be instructed and reminded to not proceed when they feel unsafe and to notify appropriate personnel if an issue or incident should arise. If participants see unsafe behavior or a potential hazard, they are required to report the matter immediately to the cleanup coordinator and safety officer.

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**Gloves** - Gloves are to be worn when picking up debris.

**Footwear** - Hiking boots, sturdy shoes, or rain boots are recommended. It is suggested, when applicable that open-toe shoes are avoided. Rocks and drift logs are extremely slippery - stick to sand or vegetated areas when possible. Do not access an area if you feel unsafe.

**Slips and Trips** - Step carefully and take your time, and only walk in areas where comfortable. Slips and trips are a major hazard. Wet rocks and logs covered in algae are also very slippery and can be sharp and jagged; avoid these areas when possible. Avoid drift logs in the water close to the shore; drift logs can knock you off your feet, roll onto you or trap and crush you.

**Ocean/ Lake/ River Conditions** - Avoid taking risks near the water, such as not entering the water to collect debris and understanding aquatic conditions, such as: powerful waves breaking on rocks, rogue waves, surging water, etc. The project manager will review current weather, tide, swell conditions, and wind information with staff during the tailboard safety briefings.

**Clothing / Hypothermia** - Warm clothing, raingear, and a toque and/or hat are required. Maintain a safe distance from the water's edge. Avoid getting wet and bring extra warm clothes. Change into warm and dry clothing if encountering water. Coordinators should be able to recognize signs and symptoms of hypothermia.

**Hydration** - Avoid over-exertion, sunburn, heat exhaustion, and dehydration. Water and meals will be provided for volunteers. Fresh water sources should be treated or boiled prior to consumption.

**Hazardous Waste** - Do not go near any hazardous or suspicious materials (keep a look out for possible hazardous identification), and watch for sharp items. If hazardous materials such as large drums, fuel containers, flares, or suspicious containers are located, stay up wind of the material, mark the area with flagging tape, and inform the project manager right away, who will then contact local authorities or appropriate responding agencies. Do not use your mobile phone around any unknown materials. If possible, make notes of any markings on the container which may help authorities identify the contents. All sharp items or broken glass are to be placed in rigid containers also known as sharps containers (a rigid container ideally made of metal or plastic) and should never be handled with bare hands.

**Syringe Collection** - Have only project managers or coordinators collect syringes, which may have a needle associated with it. If the team leads are not comfortable collecting the syringe, mark the location and contact local authorities for collection. Syringes should not be disposed in a garbage bag, can or dumpster. The team leads will have to learn from local authorities as to where to dispose of any medical waste. Heavy-duty work or canvas gloves are required if collecting syringes. Syringes should be picked up with the needle pointing down and away from the body, and placed end first into a rigid container.

**Buddy System** - Always stay in teams of at least two even when travelling and working. Buddy systems will be created during orientation or during the tailboard meeting

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**Wildlife** - There may be wildlife located in the cleanup area. Do not approach and do not touch or pick up dead animals, or attempt to move injured animals. Make the project manager aware of animals and their location. The project manager will contact responsible authorities. Stay as a group or in a buddy system and make noise to avoid encounters.

**Lifting** - Never lift anything too heavy; when in doubt, don't try. For general lifting - take a firm grip on two sides of the object, keep your back straight and lift with your legs (i.e., bend knees and do not use your back). Do not remove large items that are too heavy to carry.

**Communications** - In remote locations, the project manager, boat operator, coordinator and safety officer (s) will have a VHF radio to contact authorities in the event of an emergency.

**First Aid** - The project manager will have a level 1 first kit on-site in case of accidents. The boat operator will also have a level 1 kit available on the boat. The project manager and coordinators will have appropriate first aid training. Any injuries must be reported to the coordinator and if serious, medical attention should occur promptly with the participant seeing the first aid attendant or taken to the nearest hospital.

**Location** - The project manager will review with participants the shoreline cleanup location(s); a map will be provided. Obey all warning signs for a site.

**Shoreline Etiquette** - Be cautious and aware of sensitive habitat areas (i.e., sand dunes, intertidal zone, breeding birds), pack out what you pack in, and leave no trace (take picture and leave only footprints)

**Hygiene and Sanitation** - Use outhouses where possible or bury human waste in the intertidal zone (not in the forest or drift log areas). Wash hands and forearms before eating. Soap, sterile wipes, and clean water should be brought to the cleanup event. Do not wash dishes or clothes within 30 meters of a drinking water source.

### 3.3 Additional Shoreline Cleanup Safety Measures and Guidelines

#### 3.3.1 Wildlife and Animals

Wildlife and domestic animals may be encountered during shoreline cleanup events. It is important for the project manager and coordinators to learn about the type of potential wildlife that they may come across,

It is important that participants never approach, surround, crowd, or follow any animals (dead or alive) or try to feed them. Respect all wildlife and animals, as well as regulations and guidelines of protected sites, closure areas and other management features designed for wildlife, vegetation and the safety of visitors.

If participants encounter a live entangled animal, appropriate authorities need to be notified right away. Participants should never attempt to disentangle an animal as harm or injury is possible,

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and this would cause stress to the animal. Dead animals also need to be reported to authorities promptly.

Pets are not permitted on shoreline cleanups unless separately arranged with the cleanup coordinator and project leads. This will help to minimize any further unexpected circumstances while your team becomes familiar in organizing such events.

TIP:

\* Additional wildlife and animal tips to consider:

- Wildlife behaviour is unpredictable, especially when females are with young or when males are defending their territory during mating season
- Understand defensive warning signals from wildlife such as noises, hair rising, and body movement
- View or photograph wildlife from a distance with proper equipment such as binoculars or a telephoto lens; all animals will feel stress if crowded by humans (if you cause an animal to move, you are too close)
- If the wildlife is a safety threat, create a loud noise and conduct actions to alert the animal
- If wildlife is not a safety threat, do not create loud noises and actions that may stress the animal or cause them to waste energy with unnecessary flight
- Avoid trampling or damaging vegetation; wildlife may be breeding, nesting, brooding or raising young in vegetated areas
- Keep the cleanup site clean, as well as the camping area if applicable i.e., keep the area bare of attractive smells
- Travel as a group and use the buddy system
- Stay alert and be aware of your surroundings
- Carry bear spray or capsaicin (chemical found in chili peppers) to use as a deterrent by spraying into an animal's eyes if approached
- Stay on designated trails and respect all signs

### **4.0 Communications – Marine, In Event of an Emergency, Check-ins**

Communications during the cleanup planning process, during cleanup execution and post-cleanup play a major component of a successful event. The purchase of VHF and two-way radios, satellite and cell phones, and In Reach devices may be required to enable accessible in-field communications between cleanup leads, participants, and responding agencies.

#### **4.1 Boat Safety**

If the cleanup event requires marine vessel transportation, VHF radio channels to monitor for two-way communications between vessel operators and participants will be required. The boat operator will provide a boat safety briefing upon departure and overall boat safety for participants.

#### 4.2 Action and Communications Plan in the Event of an Emergency

The project manager, coordinator (s), and safety officer (s) will be equipped with a marine VHF radio and a cell phone. Participants will immediately advise these team leaders of an incident, so they can communicate and respond to an incident by making arrangements for appropriate first responders and evacuation. Police, fire and possibly Coast Guard would be notified to potentially support the transport of a patient (s) by responding vehicles and vessels. Search and Rescue will be contacted if ground evacuation is required or for a lost person incident. Coordinators will have regular check-ins with the project manager and boat operator.

#### 4.3 Emergency and Safety Contact Numbers - VHF radio, satellite phone, cell phone

Emergency contact numbers to consider when conducting safety planning are outlined below. Ensure all participants receive applicable emergency and safety contact numbers.

- If someone is injured: Call the emergency contact number sourced during planning
- VHF marine radio channel: Identify local Coast Guard radio channel
- Project Manager: \_\_\_\_\_
- Safety Officer: \_\_\_\_\_
- Coordinator: \_\_\_\_\_
- Responding Agencies: \_\_\_\_\_
- Coast Guard: \_\_\_\_\_
- Marine Mammal Entanglement: \_\_\_\_\_
- Spill and Hazardous Waste Reporting: \_\_\_\_\_

#### TIP

\* Check-ins with reliable personnel offsite via satellite phone should be conducted during the cleanup event when cell phone services are not available.

#### 4.4 Information Package – What to Bring, Emergency Contact Numbers, Expected Climatic Conditions, Site Maps

Leading up to the cleanup event, it is important that participants know the details of the cleanup. Providing an information package at least two weeks prior to the event will help to ensure participants are prepared. This package must include essential recommended items to bring, emergency contact numbers to leave with participants, family or loved ones in case of an emergency, as well as a site map, and expected climatic conditions, See Appendix 1 Participant Information Package.

Items to consider when planning personal participant equipment and supplies are outlined in Table 2.

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Table 2. Recommended personal equipment to bring on a cleanup

<b>Clothing</b>	<b>Camping Supplies</b>	<b>Miscellaneous</b>
Water proof closed toe shoes/boots with good grip	Headlamp	Serrated knife
Rain protection (waterproof jacket, waterproof pants)	Tent	Waterproof matches, lighter
Long pants, long underwear, long and short sleeve shirts and sweaters (fleece or wool)	Sleeping bag and mat	Personnel medication
Gloves (canvas, neoprene or waterproof)	Reusable water bottle	Sunglasses
Wool socks	Cutlery set, plates, bowl	Sunscreen
Sun hat and toque	Toiletries	Bug spray
		Waterproof paper and pencil

\* For additional details, please review Appendix 1 Participant Information Package

TIP:

\*Additional guidelines as to what to bring:

- Dress in layers and avoid cottons
- Closed toe shoes/boots with good grip are recommended
- Neoprene materials are mandatory if water entry is anticipated
- It is strongly recommended to bring one pair of knee-high rubber boots and one pair of waterproof hikers for remote cleanup
- Drink plenty of water and remember to eat snacks

### 4.4.1 Safety Briefing, Tailboard and Waiver Forms, Emergency Contact Numbers

All participants will meet prior to the cleanup to review basic procedures and to initial a ‘tailboard’ form to illustrate they participated in the safety briefing and will adhere to safety guidelines. Participants are expected to review and sign the Participatory Waiver forms.

Emergency contact numbers will be located in the Participant Information Package. The project manager will obtain and uphold emergency contact numbers for all participants.

### 4.4.2 Climatic Conditions

Climatic conditions to consider for a shoreline cleanup will depend on the region and season where the event is taking place. Weather patterns will vary in geographical areas and can be affected by latitude, terrain, altitude, nearby waterbodies and climate change. A coordinator will need to consider these factors and share with participants, so they can prepare appropriately for an event.

It should also be identified that site access to cleanup locations by vehicle and boat can at times become restricted by weather or sea conditions. These climatic conditions may present logistical challenges, which could result in increased efforts with coordination, project management, and scheduling of field work.



## 5.0 Event Planning

### 5.1 Cleanup Supplies and Materials

It is important to use as little single use plastic as possible during your cleanup to ensure you are not creating more plastic waste.

The items that will be required during your event are outlined below.

- Work gloves
- Collection carriers, preferably that are reusable (mattress bags, canvas and burlap sacks, buckets, compostable bags)
- Supersacks and line to tie the sacks closed and possibly together
- Serrated knives
- Shelter (tent, tarps)
- Signage
- First aid kits
- Communication devices such as cell phone, VHF and two-way radios, satellite phone and InReach devices
- Lifejackets and safety supplies for marine transport
- Waivers, emergency documents and contact numbers, safety plan
- Porta potty and sanitation sink (handwashing capability)
- Flagging tape
- Pencil and waterproof writing pad
- Water supply system
- Coolers, tables, kitchen shelter for eating / rest area
- Insect spray if applicable
- Shoreline monitoring equipment: survey measuring wheel, hand-held GPS unit with extra batteries, digital camera with extra batteries, flag markers or stakes, sturdy 12” ruler, clipboards for data sheets, pencils

### 5.2 Food and Water

Businesses and organizations that host cleanups tend to supply food and water. If you will be offering this, then it is important to factor in all food safe requirements, such as ensuring meals are prepared in certified kitchens, food is stored at an appropriate temperature, etc.

It is important to consider dietary restrictions when planning for event catering. If cleanup participants are registering for the cleanup, a question around determining dietary restrictions may be included in the registration form.

**TIP:**

\* When people are working amongst water conditions, they often forget to drink water. Account for climatic and environmental conditions and ensure people are drinking enough water.

### 5.3 Accommodations

If your cleanup event will last more than one day, then accommodation planning will be required. It is important to factor in looking at various options for group lodging, such as camping, the use of a lodge or hotels, or other billeting options, as well as if participants will have specialized or unique sleeping requirements. For multi-day remote cleanups, your planning will need to include setting up a base camp, which should provide a shelter and a kitchen area.

### 5.4 Sanitation

When bathroom facilities are not provided at a cleanup site, it is recommended to bring in porta-potties and sanitation sinks if available.

### 5.5 Strive for Zero Waste

Do not use single-use disposable plastics during cleanup activities and create as little waste as possible before and during the cleanup. Part of the point of these cleanups, is to manage the mismanaged waste while creating as little waste as possible during the process.

When purchasing supplies, try and purchase items that you can reuse for future cleanup activities.

## Section II: During Cleanup & Implementation

### 1.0 Collection Techniques

Collection techniques are an important factor to consider when coordinating cleanup events. Marine debris collection tends to focus on plastics as this is the dominant material type during cleanup activities. When looking for marine debris and ocean plastics, make sure you explore any vegetation line (i.e., forested, shrub or grassy areas). Glass and lighter plastics can often get blown deeper into the forest or vegetated areas. When cleaning up an area, make sure you approach the site from different angles, often times the human eye will identify more waste in the area that has just been cleaned after viewing it from a different angle.

In an effort to avoid handling materials twice, it is recommended, when applicable, to sort materials during collection techniques. Debris can be sorted and stored into the categories outlined below.

- Rigid (hard) plastics and soft (film) plastics
- Styrofoam (foam) plastics
- Fishing and aquaculture supplies (buoys, floats)
- Rope
- Scrap metal
- Processed lumber and wood waste, cardboard and paper
- Glass and fibre glass
- Clothing, fabric, textile and shoes

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- Tires
- Returnable items such as beverage bottles with labels
- Reusable materials (items that can be resold, used for art or decorations, etc.)
- Significant items that may have cultural importance
- Unclassified items
- Remember: hazardous materials should be left where located (do not approach potentially hazardous items)

### TIP:

\*Sorting techniques should be refined with local and regional recycling options. This will ensure that materials are separated in the most efficient manner for recycling or repurposing.

See Appendix 3 – Zero Waste Cleanup Sorting Categories for additional details on sorting options to consider.

## 2.0 Volunteer Distribution Down Shoreline

It is effective to have small groups of participants (<75 people) stay together so they can walk down the length of the shoreline for collection and consolidate of materials. However, volume of material also plays a role in how to distribute people. Ensure that there is sufficient material for the number of volunteers you are anticipating.

It is useful to designate certain people to cover the vegetation line as this area of the shoreline can be more time consuming and challenging to clean. When designating vegetation specific cleanup groups make sure they are:

- Aware of potential site hazards
- Wearing appropriate clothing that will protect them from sharp branches or bushes
- There is a minimum of two participants together at all times

If the vegetation line is significantly more concentrated with materials than the rest of the shoreline, designate sufficient volunteers to the area.

For larger groups of volunteers (75-300 people), it is more effective to spread the groups down along the shoreline. This will ensure that large groups have enough materials to pick up while they walk the shoreline and that people are not walking on top of one another.

### TIP:

\* Remember to use the buddy system.

## 2.1 Walking Patterns

### 2.1.1 Single Line Grid Method for Locating Marine Debris

## Strategic Planning Framework for Shoreline Cleanup

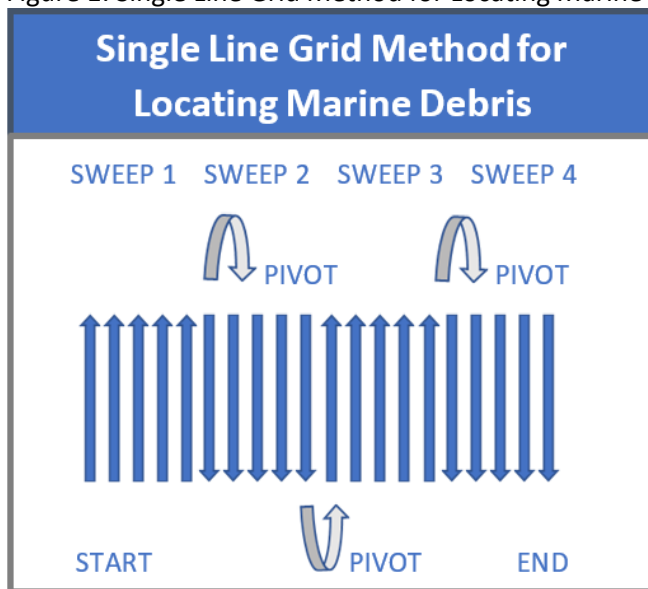
The single line grid method is an effective method to view a general site from multiple angles to locate marine debris. To set up this method, participants are distributed in a line down the width of the beach. Once participants are evenly distributed, have them walk slowly through an area in a straight line. Generally, along coastal shorelines, the ocean or nearshore zone (also known as subtidal zone) is located on one side of participants. The riparian or backshore zone (also known as upland zone), which may have natural barriers (e.g., trees, shrubs) is located on the other side of participants. Prior to locating marine debris, the group will line up in a straight line within the foreshore (intertidal, beach and shoreline zone), which is between the two nearshore and backshore zones.

It is important that participants maintain their walking pace with the person on each side of them. The coordinator will have to decide how many participants to put in each shoreline area to ensure the entire area is adequately accounted for. It is recommended to space participants out in a 1 m to 5 m range depending on the volumes of debris. If the shoreline consists primarily of small marine debris items (i.e., a size of a quarter to the size of a hand), a 1 m to 2.5 m space is recommended, whereas if the shoreline has small to moderate size marine debris (i.e., the size of a hand to a basketball), it is recommended to space participants 2.5 m to 5 m apart.

### 2.1.2 Parallel Pass Method for Locating Marine Debris

If participant numbers are low, it is recommended to conduct parallel passes to ensure the area is entirely covered. If the team is unable to cover the entire shoreline in a single sweep, a pivot line is used. When this occurs, the team walks to the end of a shoreline in a single line and then participants will pivot sideways and make a second sweep 180° to the initial line. Figure 1 illustrates how to set up the single line grid method for locating marine debris along a shoreline.

Figure 1. Single Line Grid Method for Locating Marine Debris



TIP:

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\* Remember to look back and scan the areas you clean as you walk down the beach to ensure you are viewing the site from multiple angles.

\* This method can also be used during a site reconnaissance or pre-cleanup survey work.

### 3.0 Handling Debris and Safety Measures for Marine Debris Removal

It is recommended that all participants wear gloves during the cleanup to protect hands for health and safety factors. Typically, gloves are provided by the organization or business coordinating the cleanup event. Additional handling recommendations are outlined below.

- Typical items found include Styrofoam, fishing floats, fragmented hard and soft plastics, rope, drink bottles, etc.
- If you are not sure what it is, do not approach or touch the material.
- Do not lift heavy items alone (e.g. tires, barrels, pallets). Ask for help or leave the item behind.
- Watch for sharp edges on plastic and metal items.
- Do not open closed drums or canisters.
- **Report hazardous materials.** The cleanup coordinator will need to identify the appropriate authority in accordance with local regulations to report and dispose of any hazardous materials.

Debris will be collected into sustainable (reusable, biodegradable) bags such as burlap, mattress bags, super sacks, and compostable bags.

### 4.0 Super Sack Etiquette Option

During some cleanups, supersacks may be used to contain marine debris and provide easy transportation for materials. A supersack is a one cubic meter white gravel or recycling bag, often used by industry to contain materials. This methodology is set up for the use of three supersacks, one for each of the following categories:

- #1 bag for all foam/Styrofoam (PS)
- #2 bag for all water bottles (PET/ PETE)
- #3 bag for hard mixed plastics and everything else (LDPE/PP/HDPE/Other)

The method consists of lining up three open supersack bags. As collection bags are filled, have a minimum of one person run full collection bags from people collecting debris back to the supersack centre. Once the full bags are transported to a recycling centre, they can be re-sorted into the options available for recycling. You will need at least one runner and one to two people sorting at the centre once your system gets going. The empty collection bags can be used again for more material during the same shoreline cleanup with the volunteers.

The purpose of this method is to help pre-sort materials in the field. This method should be utilized in areas of high concentration of debris. Again, this etiquette should be developed with the local recycling options to maximize efficiency.

#### **TIP:**

\* All items collected **MUST** be stored in either a mattress bag, super sack or secured with rope.  
**NO LOOSE ITEMS**

## Strategic Planning Framework for Shoreline Cleanup

\* Keep an eye out for interesting debris items e.g., items with Asian symbols, personal items like sporting goods, and items that may be traceable to an individual from another country.

### 5.0 Data Collection and Debris Monitoring

Monitoring marine debris is required to help understand the condition of our shorelines, trends of debris, and to evaluate potential impacts to habitats, aquatic life, economic and human health, social values, and safety. The National Oceanic Atmospheric Administration (NOAA) is a federally funded program that has a specific branch to manage marine debris. It is recommended to consider the programs and resources available through this organization, such as the NOAA Marine Debris Shoreline Survey Field Guide. This shoreline monitoring program is accessible through NOAA's website, which outlines appropriate protocols designed to support cleanup organizations. The monitoring program is designed to support tangible evidence of the changes in marine debris over a certain time period for a geographical area. By quantifying debris volumes over time and understanding the challenges with recycling/upcycling marine debris, and the limitations for the disposal, a case for additional cleanup assistance could be supported. It is recommended to consider monitoring options and determine the length of time until revisiting a site.

#### 5.1 Option 1 for consideration: NOAA Accumulation Survey

The NOAA *Accumulation Survey* for debris shoreline monitoring conveys a debris deposition rate (number of items / unit area / unit time). This survey is ideal for beaches where shoreline cleanups do occur and all materials are collected, weighed and inventoried. This survey is a great option for integrating school groups to assist with the collection and monitoring of the plot on a continuous basis (e.g., once per week or per month) Because debris is removed, the density of materials on a shoreline can not be calculated over time as subsequent surveys will remove material and bias results.

#### 5.2 Option 2 for consideration: NOAA Standing Stock Survey

The NOAA *Standing Stock Survey* conveys density for an area (number of items per unit area). This survey is ideal for beaches where shoreline cleanups do not occur. This is a quicker assessment than the *Accumulation Survey* because the debris is not removed and weighed. This survey is a great option when learning the accumulation of debris density on a shoreline as it gauges debris input vs. debris output (i.e., tides, large waves, storm systems) to understand the overall influence of debris to a geographical area.

#### TIP

\* For additional information on NOAA marine debris monitoring, visit <https://marinedebris.noaa.gov/sites/default/files/publications-files/ShorelineFieldGuide2012.pdf> .

## **6.0 Cleanup Event Wrap Up**

When completing a cleanup event, all debris should be weighed (if applicable) and data cards or inventory summaries should be provided to the coordinator. It is important to wrap up a cleanup event with learning from participants if they have any lessons learned and what could be done to improve future cleanups. The coordinator is to provide a thank you to participants and a team photo is always nice.

## **Section III: Post Cleanup**

### **1.0 Marine Debris End of Life Management Options**

There are options for the management of marine debris collected and consolidated from cleanup events; however, the capacity of county/municipal solid waste systems for recycling and disposal may have regulations and stipulations (e.g., Styrofoam and plastics may require cleaning, ropes and lines may not be permitted to be disposed of, etc.). Additionally, substantial volumes of waste may pose adversity to smaller communities, which may result in high tipping fees. It is recommended to partner with innovative and sustainable businesses that can offer solutions as to how to manage debris materials collected.

The assessment of debris may result in specialized disposal protocols, particularly for hazardous waste, vessels and Tsunami Marine Debris (TMD).

There is a potential to identify debris items from natural disasters such as tsunami events. These materials may include: hazardous materials, vessels and objects from vessels, objects containing aquatic invasive species (e.g., Mediterranean mussel, acorn barnacle, etc.), potential cultural/personal significance items that may have special writing or markings, and location-specific construction materials. Potential TMD items located during cleanup events are to be shared with the project manager, so staff can notify appropriate agencies.

#### **TIP:**

\* Coordinators will want to have a scale on site or have the trucks removing debris materials weighed in order to track the amount of debris removed from your site.

Coordinators may want to consider tracking debris by volume. This is particularly of interest with large volumes of plastic such as foam but have very little weight. Having well rounded metrics will enhance the results of your cleanup and reiterate the importance of this work.

### **2.0 Disposal Options for Non-routine and Large Debris (Potentially Hazardous)**

When planning for disposal options for potential non-routine and large debris items, it is important to determine appropriate emergency contact numbers for items that may pose an

immediate environmental or public safety threat. Items that may be considered as non-routine are potentially hazardous waste, derelict vessels and wrecks or parts of these vessels, materials that arrived from potential tsunami events, and aquatic invasive species. Large items and derelict vessels may pose a hazard as they could contain unknown substances or because of their structural integrity. Large items should be categorized and treated with similar caution as to suspected hazardous materials.

### TIP

\* If it is unclear if an item is hazardous, do not approach it. Exercise caution and report to the cleanup coordinator who will have appropriate emergency contact numbers

### **3.0 Disposal Options for Routine and Small Debris (Non-hazardous)**

Onshore routine and small debris arriving on shorelines can be sorted and separated into categories, such as: plastics (hard, foam and film) including coloured containers and bottles, water bottles, and clean-white/dirty/yellow-brown foam ; objects from commercial fishing and aquaculture industries including buoys and floats; metals; glass; rubber, clothing/fabric/shoes/textiles; processed lumber/paper/carboard, rope, tires, and unclassified items. Refer to the last page of Marine Debris Solutions Handbook (provided separately) which has an outline of possible sorting categories for recycling and reusing materials.

### **3.1 Sort and Storage**

After debris collection, materials will be brought to a central storage area for possible sorting if this has not been conducted during the collection process.

### TIP:

\* When possible, it is recommended to sort materials during the collection process to reduce double handling.

\* Storage should be considered when end-use options have been established. Any items that contain biodegradable organic matter or possible hazardous waste should not be stored as there may be an environmental or health risk.

### **3.2 Reuse**

The reuse of debris items is the first recommended step in effort to prevent materials from landfill disposal. It is recommended that programs and initiatives for salvage of community use options are researched prior to the cleanup. This will support agreements and recommendations to be developed for these materials. Communities close to coastal settings tend to have beachcombers, artists, salvagers, and volunteers that utilize marine debris for various reasons such as art projects, resale, decorations, repurposing for making other products, etc. Traditional high-grade marine debris includes glass balls, lumber, large barrels, Styrofoam blocks and other diverse items that remain intact.



### TIP:

\* The reuse of marine debris has a potential to provide a community benefit, economic development and may offset disposal costs.

### 3.3 Recycle

The options to recycle marine debris can vary greatly depending on geographical areas, the value of current recycling markets, existing recycling solutions, and product stewardship programs. It is recommended that all available recycling options are researched prior to the cleanup. This will support agreements and recommendations to be developed for these materials. Considerations to factor regarding recycling marine debris are outlined below.

- Identify the closest recycling facilities to your cleanup
- Discuss with recyclers how they require the materials separated (e.g., plastics can have different resins, which will factor how they are separated for processing)

The options to recycle marine debris can vary greatly depending on geographical areas, the value of current recycling markets, existing recycling solutions, and product stewardship programs. It is recommended that all available recycling options are researched prior to the cleanup. This will support agreements and recommendations to be developed for these materials.

Materials will need to be separated and identified based on the guidelines set by the recycler and current recycling systems, and it should be noted that not all material collected may be suitable for the inclusion as a recyclable product. For example, recyclers that process plastics may require clear identification of the type of plastic with the resin codes (international numbered triangle symbols). Marine debris has the potential to be transported long distances in the ocean resulting in fragmentation, weathering and contamination by salt, water, marine and terrestrial growth, which could remove these symbols limiting effective recycling. This makes it difficult for participants when they separate materials.

It is important to work within the current recycling options, geographic logistics and other factors unique to an area, while collaborating with businesses, organizations and stewardship programs to support waste management initiatives.

### 3.4 Upcycle and Technical Solutions

The options to upcycle marine debris can vary greatly depending on geographical areas, the value of current recycling markets, existing infrastructure and recycling solutions, and product stewardship programs. It is recommended that all available recycling options are researched prior to the cleanup. This will support agreements and recommendations to be developed for these materials. Recommended upcycling options to consider are outlined below.

- Various forms of compaction such as chippers, shredders, conversion to oil (plastic to fuel technology), and incineration

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- Determine if local businesses, organizations and community members are utilizing materials for art projects, decorations, and cultivating new products such as picture frames and house moldings or recycled forms of packaging

### **3.5 Disposal**

When items are required to be disposed, due to limited salvage, recycling or upcycling options, possibly due to the composition and degradation of materials, and the proximity and location to facilities, it is recommended that adequate assessments of the volume of this material is devised prior to the cleanup. This will ensure appropriate agreements are developed to dispose of these materials.

### **Conclusions**

There are various factors to consider when planning and coordinating a shoreline cleanup event. This strategic framework is a general guide to illustrate the key components involved to ensure safe and effective events. The overall goal is for participants to come away with a meaningful and rewarding team building experience, while reducing the environmental impact from accumulations of routine and small marine debris items.

Shoreline cleanups are important as they not only help to create a cleaner environment, but generate much needed awareness to the severity of the issue, as well as generate momentum to improve strategies to collect, remove and process these materials.

When a shoreline cleanup is successful, it can be a remarkable example of cooperation and can demonstrate how working as a team can have a positive impact on protecting a shared marine environment.