Micro-Marine Debris Clean-Up Training Manual

Developed by
Sembler and Sembler, Inc.

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CHAPTER 1: INTRODUCTION

Manual Purpose

The *Micro-Marine Debris Clean-Up Training Manual* is to help those parties interested in learning how to plan, manage and execute their own micro-marine debris clean-up activity. Much of this Manual has been written in a broad manner to allow flexibility in the clean-up program with many sections providing detailed information. It is crucial that the reader understand that this information has been provided as a guide to be used to help them craft/customize their own micro-marine debris clean-up activity.

This Manual does not replace or relieve any person from operational procedures for any site, safety, health and environmental compliance, or any responsibility under law, code, rule, ordinance, statute or any lawful authority. Clean-up managers must investigate and comply with federal, state, or local laws and regulations.

Sembler and Sembler, Inc.

This Manual was written by and is based on the extensive experience of Sembler and Sembler, Inc., a family-owned business that has been operating in Florida since 1901. In the past decade, Sembler and Sembler, Inc., has been involved in a variety of major debris clean-up and recovery operations in Florida and several other states. As a result of these activities, Sembler and Sembler, Inc., has developed and implemented best-management practices for macro- and micro-debris clean-up, and provided in-depth reports pertaining to these activities. The company has successfully completed clean-up contracts for the Florida Department of Agriculture and Consumer Services, Division of Aquaculture; Florida Department of Environmental Protection; U.S. Fish and Wildlife Service, Pelican Island National Wildlife Refuge; and City of Sebastian; as well as a multitude of private property waterfront owners. Sembler and Sembler, Inc. has cleaned up more than 40,000-plus acres in the Indian River Lagoon alone. In addition, the company has extensive hurricane and HAZMAT clean-up experience involving chemical, gas and crude oil spills. This experience includes wildlife rescue and recovery from hazardous environmental conditions.

Organizational Hierarchy

When planning any volunteer clean-up activity, it is important that the proper leadership and organizational hierarchy be established. These positions should include but not be limited to: senior supervisor, safety officer, staff supervisors, volunteer coordinator and press relations coordinator. It is the responsibility of the senior supervisor to assign job duties to the various staff supervisors based on their skill strengths and experience. The senior supervisor will also determine who will handle volunteer and press relations. Most, if not all of these supervisory positions can be handled by skilled volunteers.

Based on the complexity of the site-specific field conditions, it may be prudent to hire an experienced clean-up professional to oversee and direct all field clean-up activities.

Notes:

CHAPTER 2: THE ENVIRONMENTAL EFFECTS OF MICRO-MARINE DEBRIS

What is Micro-Marine Debris?

We can't begin to clean up micro-marine debris without first understanding what it is. Micro-marine debris is any small or "micro" man-made item that has found its way into the marine environment. These small items can range in size and material; however, what they have in common is that they are an eyesore and hazardous to the environment and wildlife.

Examples of micro-marine debris are items or their degraded components made from plastic, glass, metal, rubber, soda bottle caps, cigarette butts, handheld lighters, zip ties, sandwich bags, fishing lures, pieces of rope, pieces of clothing fabric, Styrofoam, monofilament line, derelict fishing gear that have been lost or discarded, paper, polymers, packing materials, cardboard and even medical items such as syringes.

Micro-marine debris found along the shoreline of the Indian River Lagoon, Sebastian, Florida.

Micro-marine debris finds its way into the environment through a variety of ways. Many times it is discarded or blown off recreational and commercial fishing boats or discarded by recreational users along the shorelines, beaches and spoil islands. Sometimes the micro-marine debris is the result of storm-water runoff that sweeps land-based litter into nearby bodies of water, such as a river, stream, canal or ocean. Another cause of micro-marine debris is natural disasters such as tropical storms, hurricanes, tornadoes and any other weather event that causes high winds and heavy rains. These weather conditions cause man-made items, large and small, to be blown or washed into local bodies of water.

In many instances, micro-marine debris starts out as a larger piece of debris known as macro-scale (large) or meso-scale (medium) debris. These larger pieces of debris become broken down into smaller "micro" debris pieces over time due to exposure to the sun's ultraviolet rays, wind and rain-driven tumbling, pounding by tide and surf, and other natural forces. Once broken down, this debris becomes very difficult to clean up and exponentially more harmful to the environment and animal and plant life.

In October 2011, a tropical storm occurred off the east coast of Florida. This tropical storm brought with it heavy rains and strong winds that pummeled the area for several

days. Following the storm, a large amount of macro-, meso- and micro-debris could be found along the shoreline and spoil islands in the Indian River Lagoon.

Debris washed up along a shoreline and, over time, becomes incorporated into vegetation.

Because the marine debris was washed ashore during a tropical storm, it was pushed by strong waves and winds above the natural high water mark. Ultimately, the mixture of debris sat on the shoreline and became embedded and layered into decaying grass and straw and woody detritus. Plant life has begun to grow in and around it. Simultaneously, the debris slowly became more brittle, dry and unstable due to its exposure to the sun, wind, rain, heat and cold. If and when there is another storm, the waves will once again pound the shoreline of the spoil island where the pile of straw and debris will be lifted from its resting place, much like a raft that has been set afloat. Once set free, it will float in the waters of the Lagoon where it will be pummeled by the waves and broken into smaller pieces.

At the same time, these very same winds severely damaged vegetation along the shoreline and on the spoil islands of the Lagoon. The green leaves have been blown and stripped from the branches of the trees which form a natural canopy. Since the debris is no longer shielded by the green leaves, it can then be more easily seen and accidentally ingested by animals that confuse it as a source of food, or picked up by marine birds such as the osprey and used as building materials in their nests.

Osprey nest built with a variety of marine debris items.

The most opportune time to clean up marine debris is following a large storm or in the late summer after the largest concentration of boaters, fishermen and recreational users have been on the water. It is at this time that debris can most readily be seen and retrieved and clean-up operation efficiencies can be maximized. This clean-up time period allows the debris to be removed while it is still relatively intact and

has not yet become completely entangled, brittle, buried or broken down by the elements. The longer the marine debris sits, the greater the opportunity for ingestion by marine animals, use as nesting material, breakage into smaller pieces and ultimately becoming an increased threat to the marine ecosystem as a whole. Not to mention, it is much easier to retrieve large pieces of debris rather than small pieces of micro debris.

Why is it Important to Remove Micro-Marine Debris?

One of the most obvious reasons to clean up micro-marine debris is that it is an eyesore and not aesthetically pleasing. However, that is not the most important reason to clean up the debris. Most people do not realize that the micro-marine debris is extremely harmful to the marine life and their habitat.

When micro-debris ends up in a marine environment it can have many harmful effects, which include:

- Smothering or damaging vital habitat, such as coral reefs, mangrove fringes and tidal wetlands.

- Injuring, suffocating, strangling and killing marine wildlife that has become entangled in discarded netting, plastics and other items.

- Causing internal injury, intestinal blockage, starvation and death to marine animals such as sea turtles, seabirds, and mammals that consume micro-marine debris. The small pieces of debris may become entangled in the animal's natural food source and mistakenly ingested by the animal. It is well documented that sea turtles often accidentally eat clear plastic film floating in the ocean, after mistaking it as jellyfish, which is one of their food sources.

- Becoming lodged in vegetation as it grows, where it becomes permanently embedded.

- Use by birds as nesting material that may entangle growing chicks.

Plastic marine debris is one of the most visible and harmful types of debris found in marine ecosystems today. "Plastic" is a term used to describe a broad group of artificial or manmade chemical compounds that includes many types of resins, resinoids, polymers, cellulose derivatives, casein materials, and proteins. According to the NOAA Marine Debris Program website (http://marinedebris.noaa.gov/info/plastic.html), common types of plastic include:

Acronym	Full Name	Example
PET	Polyethylene terephthalate	Soda bottles
PES	Polyester	Polyester clothing
PE	Polyethylene	Plastic bags
HDPE	High-density polyethylene	Detergent bottles
PVC	Polyvinyl chloride	Plumbing pipes
PP	Polypropylene	Drinking straws
PA	Polyamide (aka nylon)	Toothbrushes
PS	Polystyrene	Take-out food containers

While many items made of plastic will eventually break down until they are virtually impossible to see with the naked eye, that doesn't mean that they are no longer present in the environment. Most plastics degrade until they turn into "micro plastics" or pieces smaller than 5mm long. While some plastics are touted as being bio-based or biodegradable, they are designed to break down quickly in a landfill or compost pile, not in the waters of the oceans, lagoons, bays or rivers. Obviously, once the debris breaks down into "micro plastics," it is virtually impossible to effectively collect and dispose of properly.

Plastic items collected from the shoreline of the Indian River Lagoon, Sebastian, Florida.

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CHAPTER 3: PLANNING A MICRO-MARINE DEBRIS CLEAN-UP EVENT

When planning a micro-marine debris clean-up event, there are a multitude of factors that need to be taken into consideration. The more upfront thought and planning that takes place before the event, the greater the chances are that the event will be successful. The following factors should be considered when planning an event and choosing possible venues:

- Time of year and day of the week for optimum participation.
- Anticipated weather conditions based on historical data (hot, cold, windy, rainy, hurricanes).
- Previous debris clean-up experience of participants.
- Anticipated number of participants.
- Time allotted for the event (full day/half day).
- Time and location considerations for breaks, restrooms, lunch, travel to and from training location and any field site assessments.
- Food and beverage accommodations.
- Transportation requirements (trucks, cars, buses, boats, all-terrain vehicles, etc.).
- Format of training presentations: printed handout materials, photographs and Personal Protection Equipment (PPE) displays, audio-visual/power-point presentations, oral presentations, question/answer periods, and in-field training exercises.
- Set up and breakdown time for training setting (classroom/field/mixed).
- Back-up date/location due to unexpected changes.
- Public relations/media handling.

By giving thorough consideration to these planning factors, the initial framework can be laid and additional planning can take place for conducting a well-attended, enthusiastic and quality training experience. Providing a seamless planned event with attention to every detail will achieve success.

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CHAPTER 4: ORGANIZING A MICRO-MARINE DEBRIS STAGING AREA

Every micro-marine debris clean-up site is unique and needs to be organized in an efficient manner. Within a clean-up site, a staging area must be established for the clean-up efforts' organizational and operational control. The staging area has within its structure individual stations or work areas that are set up to cover specific operational tasks. These stations should include, but not be limited to:

Registration Station

This is the first location that volunteer clean-up personnel will visit. The registration station should be well-marked and easy to find. Upon arrival, they will fill out a "Safety Information Sheet," log-in at the "Sign in/Sign out Sheet," and receive a name tag on which their name has been clearly written with black permanent marker.

The Safety Information/Skills Assessment Sheet should include a place for the volunteer's full name, address, phone number, email address, emergency contact person with their phone number, and a list of any physical limitations/medical conditions, such as: diabetes, asthma, and any heart conditions, etc. It is also important to include a place for the volunteer to list any allergies, since there is a chance they may come in contact with bees, wasps, poison plants, shellfish, etc. In many instances, lunch and snacks may also be provided, and it will be important to know if they have any food allergies. In the case of a medical emergency, this information will be invaluable. In addition to safety information, this form will include a checklist that will allow the volunteer to indicate their skill/experience levels in the following areas: first aid/medical/safety experience, equipment/boat operation, power-tool use, hand-tool use, etc. It is important to recognize and respect the confidentiality of personal information and that assessment sheets should be handled accordingly.

The Sign in/Sign out Sheet should include a place for the person to print their name, along with the time they checked-in or out. This will provide clean-up supervisors with a complete list of volunteers on site, and will also enable them to ensure that all clean-up personnel are safely accounted for.

The equipment/materials for the registration station should include:

- A large plastic folding table.
- Several plastic folding chairs.
- Shade canopy (if needed based on weather/site).
- Permanent black markers/ink pens.
- Clip boards.
- Sign in/Sign out sheets.
- Safety information/skills assessment sheets.
- Name tags.

First Aid Station

It is extremely important that all micro-marine debris clean-up operations include a station dedicated to first aid. This area should be well marked and easily located by all volunteers. It is also crucial that the safety personnel at the first aid station know the exact physical address for the clean-up site in the event that 911 has to be called to coordinate an emergency evacuation. In the event that the clean-up site is in a remote area such as an island, an exact physical address for an emergency pick-up point needs to be clearly established and known by safety and first aid personnel. This will enable emergency responders to provide care/evacuate the injured volunteer in a timely manner from the precise emergency pickup location. It is also important that the safety personnel staffing the first aid station know that it is their responsibility to contact 911 if needed.

Once the clean-up supervisors have reviewed all of the safety information sheets, it is crucial that they provide the first aid station personnel with all safety information sheets so that they have important emergency contact information on-hand for each volunteer. In addition, it is extremely important that the safety personnel are also provided with a comprehensive list of any/all volunteers that might require first aid due to pre-existing conditions such as allergies, asthma, heart conditions, diabetes, etc. If at all possible, it is recommended that a professional Emergency Medical Technician (EMT) or paramedic be on-site at all times.

The first aid station should include a:

- Large plastic folding table and several plastic folding chairs.
- Shade canopy (if needed based on weather/site).
- Safety information sheets with emergency contact information.
- Comprehensive list of volunteers with pre-existing conditions.
- Fully-charged cell phones with a clear cell signal, in the event that 911 must be called.

A well-stocked first aid station will include:

- First Aid Guide.
- Cold tablets.
- Alcohol swabs.
- Antiseptic spray.
- Spray-on bandages.
- Antibiotic ointment.
- Eye wash.
- Chigger/Tick remover.
- Snake bite kit.
- Blood clotter.
- Knuckle bandages.
- Triangle bandages.
- Finger splint.
- Scissors.
- Sterile water.
- Pain aid.
- Cotton swabs.
- Antiseptic swabs.
- Burn spray.
- Vaseline.
- Eye/skin neutralizer.
- Sting relief.
- Cohesive tape.
- Band-Aids.
- Finger-tip bandages.
- Ice packs.
- Salt tablets.
- Blankets.
- Butterfly bandages.
- Aspirin.
- Tweezers.
- Lozenges.
- Antacid.
- Syrup of ipecac.
- Eye drops.
- Insect repellant.
- Adhesive tape.
- Poison ivy treatment.
- Ammonia inhalants.
- Tourniquet.
- Single-use chap stick.
- Drinking water.
- Elastic strip bandages.
- Gauze bandages.

Clean Station

This station is to be used by clean-up volunteers and personnel as an area for taking breaks, resting, eating and drinking. This station should be located away from the debris identification and sorting station, the decontamination station, any micro-marine debris clean-up areas and any other areas that might allow the transfer of hazardous materials into the clean station. A sign should be posted

just outside of the clean station stating that no one should enter the area unless they have been properly decontaminated at the “decon” station and that no tools are allowed in the clean station. If there are a large number of volunteers, it may be best to cordon off the clean station using high-visibility plastic safety fencing in order to prevent the accidental or inadvertent entry by a contaminated individual.

A well-stocked clean station should include:

- A large plastic folding table.
- A sufficient amount of plastic folding chairs.
- Shade canopy (if needed based on weather/site).
- Cooler stocked with ice-down water.
- Lunch/snack items.
- Hand sanitizer.
- Paper towels.
- Plastic garbage bags.

Materials, Tools and Personal Protection Equipment Station

This station is where all of the clean-up tools and Personal Protection Equipment (PPE) are organized, stored and checked out by all clean-up volunteers. General items, tools, hand tools and PPE should be stocked with ample amounts of each to match the clean-up activity workload and the number of volunteers.

This station should include, but not be limited to:

- A large plastic folding table.
- Shade canopy (if needed based on weather/site).
- Assignment sheets.
- Color-coded round stickers.
- Color-coded debris collection buckets.
- Colored ropes and flags.
- Trail tape.
- Fire extinguisher.
- Red Hazmat buckets.
- High-visibility fencing with zip ties.
- Large debris baskets.
- Duct tape.
- Absorbent pads.
- Permanent black markers/ink pens.
- Hand-held GPS device.

- Rope ground pins.
- Two open-topped plastic containers.
- Hazard flagging tape.
- Two-way walkie talkie radios (one for each team leader, senior supervisor, safety officer and first aid station).

Hand/power tools such as:

- Rakes (hard back, garden, leaf, narrow and wide tooth).
- Shovels (flat, round point, wire).
- Weed scythe.
- Hoes.
- Loppers.
- Bolt cutters.
- Safety knives.
- Cutting pliers.
- Pliers.
- Cable cutters.
- Safety scissors.
- Fine mesh hand-held dip net.
- Small sand sifters.
- Stick magnet.
- Pitch forks.
- Debris tongs.
- Debris hooks (regular/telescoping).
- Limb handsaw.
- Gas-powered weed-eater with multiple head attachments.
- Gas-powered chainsaw.
- Claw hammer.

Always inspect tools for damaged or worn parts, and ensure that the manufacturer's safety guards, devices, etc. are used. Do not use the tool unless they comply with the manufacturer's specifications.

When using or operating all hand and power tools, proper and careful operation is imperative to avoid any accident or injury. Incorrect, unsafe or careless use of tools may result in injury to the operator and others even if they are appropriately wearing PPE. When operating power tools, there must be a "clear zone" of no less than ten feet from the power tool operator. A "clear zone" is an area that has no personnel within a ten-foot distance from another person operating a power tool. Hand and power tools must be operated in accordance with the manufacturer's recommendations.

Safety requirements when servicing power tools:

- It is crucial that all associated gasoline, fuel, oil and any other lubricants are stored in well-marked UL-approved safety containers with sealed lids. These containers are then placed inside a secondary container, such as an open-top

plastic bin. The physical location of container bins should be located away from all ignition sources within the staging area.

- It is required that when power tools are to be filled or refilled with fuel or lubricants, that appropriate PPE be worn by tool-servicing personnel and that the power tool has been allowed to completely cool off. The refilling should take place in or over the secondary container with several absorbent pads lining the bottom of the container. This is done in order to contain a fuel fire or the accidental spillage of hazardous materials. It is also mandatory that an appropriate-sized fire extinguisher be located within immediate reach of this station and should be used by volunteers who have had documented fire extinguishing training.

Debris Identification and Sorting Station

This station will be used for the identification, counting, sorting and recording of all micro-marine debris recovered at the clean-up site. Directly adjacent or behind this station there should be a sub-station set up where volunteers will package, seal and temporarily store debris.

This debris identification and sorting station should include:

- Large plastic folding table and several plastic folding chairs.
- Shade canopy (if needed based on weather/site).
- Ink pens.
- Duct tape.
- Black waterproof markers.
- Micro-Marine Debris Identification Sheets.
- Hand-held counters.
- Multiple open-topped, low-sided plastic bins.

The sub-station should include:

- Large, thick-mil debris packaging bags.
- Duct tape.
- Black waterproof markers.
- Placards/signage.
- Hazardous debris storage containers with tight-sealing lids.
- Thick polyethylene plastic sheeting.

Decontamination Station

Once clean-up volunteers and personnel have completed their clean-up tasks, either at the end of the day or prior to visiting the clean station for break/lunch, it is required that they visit the decontamination station. In this station, they will remove their PPE, wash off/decontaminate any tools or equipment that they may have used during their clean-up activities, and remove/wash off debris materials from their footwear and clothing.

The decontamination station should be located away from all other stations, as to prevent the transfer and migration of any contaminated material to other clean areas.

At a minimum, the decontamination station should include:

- Large plastic folding table and several plastic folding chairs.
- Decontamination containers (two).
- Decontamination spray (biodegradable).
- Decontamination scrub brushes (two).
- Decontamination clean rinse water container with sealed lid.
- Hazmat bucket – contaminated (“hot”) water with lid.
- Plastic bins with low sides.
- Rolls of clear plastic sheeting.
- Hand sanitizer.
- Safety scissors.
- Absorbent pads.
- Hand wash water with bucket/lid to capture wash water.
- Paper towels.
- Plastic garbage bags.
- Decon wipes.

Inventory

It is extremely important that an inventory checklist be prepared that lists all tables, chairs, equipment, tools, PPE, safety equipment, first aid supplies and materials that are

used at the event. This will allow for the proper accounting of all materials/supplies at the end of the clean-up effort.

Notes:

CHAPTER 5: SITE RECONNAISSANCE / LAYOUT

Site Reconnaissance

Before the first volunteer enters the clean-up area, it is essential that the Senior Supervisor, Safety Officer and a few experienced personnel conduct a complete walk-through evaluation of the site. During this site reconnaissance, the Senior Supervisor, Safety Officer and support personnel will assess the following:

- Location of any identifiable vegetation (such as poison ivy or poison oak) that may need to be avoided because of hazardous concerns. When necessary, these hazards will be marked using high-visibility fencing, or removed prior to entry by the volunteers.

- Location of any identifiable physical hazards or dangerous topography such as deep holes, “widow makers,” “eye poppers,” “meat hooks,” sharp limbs, rocky shoreline, etc. When necessary, these hazards will be marked using high-visibility fencing, or removed prior to entry by the volunteers.

- Types, amount and location of concentrated micro-marine debris.

- Presence and location of any identifiable micro-marine debris that may be hazardous to human health. If and when any hazardous debris is located, it will be marked with a red flag or cordoned off with high-visibility fencing.

- Most efficient trails for ingress/egress to the clean-up areas and the staging area. The supervisory team will make this decision based on the topography and the location of identifiable hazards and debris. These ingress/egress trails will be well-marked using trail tape and routed through areas where the impact on the environment is minimal. If there are any ground staubs (such as small tree roots/stumps) that are a likely trip hazard or any eye poppers (such as thin tree limb located at eye level) that may pose a significant hazard, they will be removed at this time.

- Location of any active nesting birds and wildlife dens/burrows that may need to be cordoned with high-visibility fencing or flagging tape so they will not be disturbed.

While the supervisory team is conducting and completing the site reconnaissance, the volunteers will be busy registering, filling out their Safety Information/Skills Assessment Sheet and receiving their name tags. The information on the Safety Information/Skills Assessment Sheet will prove valuable when it is time for team assignments to be made.

For small, mid and large-sized clean-up areas, site reconnaissance and layout may need to be completed prior to the scheduled volunteer clean-up day to allow sufficient time to complete a thorough site evaluation. This will allow information collected to be incorporated when finalizing the site-specific safety and work plans.

Organizing a Clean-up Site based on a Color-Coded Grid System

Once the supervisory team has completed its site reconnaissance, the Senior Supervisor will determine the layout of the clean-up site. The clean-up areas will be marked using a color-coded grid system (yellow, blue, green and orange). The color red is used only to mark physical hazards. The clean-up site will be marked using colored rope which will be tethered or pinned to the ground in a straight line to mark the boundaries of each clean up area. This system will minimize confusion amongst clean-up volunteers as to which area they are to work.

A clean-up site marked using the color-coded grid system.

The supervisory team will base the size of each color-coded clean-up zone on several factors including the density of the vegetation, the quantity and type of debris found in the area, along with the time it is anticipated to take to clean-up each area. The clean-up layout should be realistic based on site conditions, the number of volunteer clean-up workers and the time allotted for clean-up activities.

The supervisory team may consider splitting a color-coded clean-up zone into two subzones. This will provide a smaller zone for assigned volunteers to start clean-up activities and will provide the supervisory team a real-time assessment of the clean-up pace. This will enable the supervisory team, if needed, to adjust the size of each color-coded clean-up zone to the work pace of the assigned volunteers.

Once the clean-up area has been marked into zones; all immediate visible hazards have been marked with red flags, high-visibility safety fencing, and hazard flagging tape; and ingress/egress trails marked with tape, the site preparation is complete.

Notes:

CHAPTER 6: PERSONAL PROTECTION EQUIPMENT

Why do Clean-up Personnel Need to Wear Personal Protection Equipment?

Because micro-debris clean-up operations are conducted in the natural environment, it is impossible to anticipate every possible hazardous situation that personnel might encounter. In many instances, the hazards are camouflaged in the environment and no visible warning signs may be apparent. As a result, it is imperative that all personnel participating in clean-up activities wear the appropriate personal protection equipment (PPE) to shield them from any hazards. The type of PPE used during clean-up activities will vary based on several factors, including the type of environment, the weather, specific tasks assigned (such as using power tools) and the types of hazardous debris anticipated.

While cleaning up micro-debris, personnel can encounter a wide variety of hazardous materials and situations. Personnel may have to clean up man-made micro-debris such as sharp pieces of plastic, broken glass, shards of rusting metal, fish hooks, medical syringes, lighters containing lighter fluid, and containers filled with unknown substances, such as a pressurized aerosol cans with worn-off labels.

In addition to man-made debris, personnel may also encounter hazardous natural materials such as decaying bird and fish bones, oyster shells, barnacles, rocks, fish barbs, stingray barbs, sharp sticks, tree limb tips, “meat hooks,” “eye poppers” and “widow makers.” A “widow maker” is slang for dead vegetation such as a dead tree limb that has become lodged or lightly attached in other vegetation, and when that vegetation is disturbed, the “widow maker” becomes detached and unexpectedly falls to the ground injuring an unsuspecting clean-up worker. A “meat hook” is slang for a short, sharp protruding object that is difficult to see and is usually attached to a larger object. Other natural hazards that might pose a health risk to clean-up workers include poison ivy, poison oak, hornets, wasps, bees, spiders, snakes, crabs, catfish, jelly fish, sting rays, rats, lice, ticks and other vermin.

Another important variable that must be considered for hazards is the topography of the clean-up area. Along the shoreline of the clean-up area, there may be hidden holes; slip, trip and fall hazards; muck holes; oyster clusters; barnacles; sharp drop offs in water depth; uneven terrain; and shoreline escarpments. All of these area-specific hazards must be anticipated and planned for when deciding which type of protective gear the clean-up personnel should utilize.

The weather will also have an impact on which type of clothing the clean-up personnel should wear. If the weather is hot and humid, it is important that people wear light-weight and light-colored clothing in order to help avoid heat stroke, and sunscreen should be used to prevent sunburn. Likewise, in cold weather, it is important that clean-

up personnel wear layered clothing; this will provide insulation against the wind and cold and will allow for the adjustment of layers should the weather abruptly change.

It is also imperative that the physical condition and mobility of each clean-up worker be taken in consideration when clean-up tasks are being assigned. It is important to recognize and accommodate varying worker strengths, physical limitations and ability levels.

Different Levels of Personal Protection Equipment/Clothing Suitable for Site-Specific Conditions

Personal Protection Equipment (PPE) must be tailored to each particular clean-up operation and adjusted according to field conditions. For all clean-up situations, correctly sized PPE equipment and clothing should be selected to provide an adequate level of hazard protection. Over protection as well as inadequate protection can be hazardous and should be avoided. It is also important that PPE users realize that no single combination of protective equipment and clothing is capable of protecting them against all hazards.

Prior to any clean-up project, activity managers should read and implement the guidelines, standards and work activity protective measures for PPE and clothing published by the United States Environmental Protection Agency (EPA) www.EPA.gov and the United States Occupational Safety and Health Administration (OSHA) www.OSHA.gov. These guidelines and standards should be rigorously followed when outfitting each person with the PPE/clothing to suit their individual clean-up task activity.

The following is a list of PPE/clothing that when worn and used correctly will provide basic minimum levels of protection for a volunteer, community-based micro-marine debris clean-up activity:

Head protection

- Hard hats: Protects top of the head against overhead vegetation, “widow makers,” obstacles and obstructions.

- Hard hats with attached fold-down, full-face shield: Protects clean-up personnel face area when using power equipment/tools.

- Wide-rim hats: Protects against sun exposure.

Eye protection

- Clear safety glasses: Provides minimum eye protection and is best worn at all times and when working in open areas with ground-level vegetation.

- Polarized safety glasses: Provides minimum eye protection and is best worn in open areas with ground-level vegetation. Also provides additional protection against sun and glare.

- Clear safety glasses with side eye protection: Provides increased level of protection and is best worn when working in areas where overhead vegetation, obstacles and obstructions are present.

- Clear safety goggles: Provides sealed coverage around entire eye area and is held snugly in place by an elastic strap. These provide greater protection and are best worn when personnel are working in confined areas with significant overhead vegetation, obstacles and obstructions.

- Full-face shields: Worn in conjunction with safety glasses/goggles for additional protection.

Ear Protection

- Ear plugs/muffs: Provides sound protection when noisy power tools and equipment are used on site, and prevents foreign objects from entering ear canal.

Respiratory protection

- When wearing any type of respiration protection mask, the face should be clean shaven to ensure the correctly sized mask fits snuggly to the face and seals properly.

- Dust masks (light-weight paper masks).

- Quarter-mask cartridge respirators.

- Half-mask cartridge respirators.

- Full-face piece cartridge respirators.

Hand Protection

- Latex gloves (clearly labeled) with and without powder: Thin, disposable latex gloves used to protect hands from minimal hazards.

- Nitrile rubber gloves: Thicker, heavier disposable gloves used to cover the hand and wrist area. These can be used in conjunction with latex gloves for additional coverage, or in place of the latex gloves when the wearer is allergic to latex. These are best worn when the user may come in contact with liquid materials.

- Kevlar gloves: Provides hand protection against cuts, abrasions and are worn when using knives and hand saws.

- Leather work gloves: These are best used when the wearer will be coming in contact with sharp objects.

- All gloves except latex gloves should have a textured finish on the palm and finger areas to provide a non-slip surface for gripping.

Foot Protection

- No open-toed footwear of any kind is allowed.

- Enclosed-toed shoes: Provides minimum protection.

- Work boots: There are many types of work boots that provide varying degrees of foot and ankle protection. These include:

    - Leather work boots: provides minimal protection.

    - Rubber boots: provides protection from water.

    - Steel-toed, waterproof work boots: provides protection from water, and additional toe protection.

    - Steel-toed rubber boots: provides protection from water and additional toe protection.

    - Steel-toed and steel-shank, chemical-resistant rubber boots: Provides increased protection from hazardous chemicals, water, sharp objects sticking up out of the ground.

    - Snake boots: Worn when venomous snakes may be present.

- Slip-on, disposable rubber booties (worn over non-waterproof work boots): Provides waterproof protection. The bottom of the rubber booties should have a textured finish to provide increased gripping on slippery surfaces.

Body Protection

- Elbow pads, knee pads and shin pads: Protects corresponding body areas that may become injured when clean-up personnel are working on the ground or under a vegetation canopy that prevents the use of hand tools.

Clothing

- High-visibility safety vest.
- Lightweight cloth jumpsuits: provides protection against dust and dirt.
- Long pants: essential item of clothing that must be worn during all clean-up activities.
- Long-sleeved shirts.
- Temperature-appropriate layered clothing: Provides protection from the sun and wind. During hot weather, layers should be light in weight and color. During cold weather, layers should be heavier and suited to the temperature. The appropriate clothing can protect clean-up personal from heatstroke, sunburn, hypothermia and windburn.
- Rain suits: Provides protection in inclement, rainy weather.
- Hip/chest rubber waders: Provides protection from water.
- Kevlar chaps: Provides front-leg protection when using power tools.
- Snake chaps/leggings: Worn where dangerous snakes may be present.
- Personal Flotation Device (PFD) with attached whistle: Essential item that should be worn by all clean-up personnel working in or along a body of water.

Miscellaneous

- Sunscreen: Provides protection against sunburn.

- Bug Repellant: Provides protection against mosquitoes, chiggers, ticks and other biting, flying insects.

- Packs of single-use chap-stick.

- Throw ring (with sixty-feet of line attached).

Notes:

CHAPTER 7: CLEAN-UP TEAM ASSIGNMENTS, INTRODUCTORY, SAFETY AND WORK-PLAN MEETINGS

Team Assignments

After the site reconnaissance has been completed, it is time for the supervisory team to break the volunteers into teams. The supervisors should now have a comprehensive understanding and knowledge of the site-specific challenges and hazards. They should consider this information when reviewing the Safety Information Sheets of each volunteer. The volunteers for each particular team will be chosen based on their strengths, weaknesses, physical limitations and experience. Each volunteer will be assigned a color (yellow, blue, green or orange) that corresponds with the particular clean-up area and their assigned team. Each volunteer's team assignment will be clearly marked on their Safety Information Sheet in the event they need to be located quickly.

All volunteer assignments are based on the information gathered at that time. However, after clean-up activities have begun and there has been enough time to assess the work pace, some re-assignments may need to be made to achieve a safe, efficient and productive clean-up.

Introductory Meeting

Once the volunteer teams have been determined and the Senior Supervisor has chosen the Supervisory Team Leader for each team, it is now time for the mandatory introductory meeting that everyone must attend.

During this meeting, introductions will begin with the descriptions, duties and responsibilities of the:

- Senior Supervisor: Responsible for all activities/duties at the clean-up site.

- Safety Officer: Responsible for the physical, environmental and personal site safety, compliance that personnel wear appropriate PPE and properly use tools, monitoring of all participants for signs of fatigue or over-exertion, use of appropriate electronic devices to monitor weather for changes/dangerous situations, minimize potential risks in all areas, etc.

- Staff Supervisors: Responsible for monitoring and assisting all stations, team leaders and clean-up groups to ensure clean-up activities are complying with safety rules and being properly completed.

- Team Leaders: Responsible for assisting and leading their team volunteers to ensure usage of proper clean-up techniques, assistance with PPE, identification of any hazards, etc.

After the introductions are completed, each Team Leader will announce the names of their team members and ask that they gather together in a group. The Team Leaders will give each volunteer a round colored sticker (yellow, blue, green or orange) to put on their name tag, which will visually indicate their team assignment. During this time, the Team Leader will also brief their team as to any site-specific conditions or hazards that might be present it their particular assigned clean-up area. The Team Leader will stress the importance of immediately alerting them if and when any potentially hazardous materials (solid, medical, liquid) are found. A Staff Supervisor or Safety Officer will be called to assess the situation to determine if any hazardous debris materials would pose an increased risk if they are incompatible with other debris materials. The Team Leader will also assign specific tasks and make recommendations regarding which type of tools, clothing and PPE each volunteer should use for their individual assignments.

Safety-Plan Meeting

Following the team assignments and specific team briefings, all volunteers and Staff Supervisors will be thoroughly briefed by the Senior Supervisor and Safety Officer regarding basic safety guidelines and the site-specific safety plan. This is the most important meeting the supervisors will have with volunteers. Volunteer safety is an absolute priority for a successful event. At this meeting it should be stressed that volunteers are encouraged and expected to ask questions of the Senior Supervisor, Staff Supervisors, Safety Officer or Team Leaders at any time before or during the clean-up. This time should also be used to show the volunteers some samples of hazards they may encounter, such as “eye poppers,” “ground staubs,” “meat hooks,” etc. At a minimum, each volunteer should:

- Understand that all volunteers are to look out for each other. If something doesn’t seem “right” or someone seems in distress, it is to be immediately brought to the attention of the Team Leader.

- Know the exact location of the first aid station and the restroom facilities.

- If unable to verbally communicate that there is a distressful or hazardous situation, know that the signal to indicate such is by patting the top of the head numerous times in succession.

- Understand the mandatory evacuation procedures in the event of inclement weather. Once the Team Leader announces that there is a mandatory evacuation, all volunteers must stop working, and quickly leave the clean-up area using the marked trails. They are then to return to the staging area where they will quickly drop off their collected debris, drop off any tools and PPE, go through the standard decontamination procedures, and report to the staging area or appropriate designated waiting area until the “all clear” is given. In the event of lightning, it is standard procedure that the “all clear” is not announced until thirty minutes following the last lightning bolt/thunder is seen or heard. It is the responsibility of the Senior Supervisor or Safety Officer to announce when it is safe to return back to work.

- Understand the 911 emergency response procedures, which includes who is designated to call 911, and that there is a mandatory evacuation of the clean-up site by all volunteers in the event there is a 911 emergency. Emergency decontamination procedures are reviewed in detail.

- Know what to do in the event the volunteers encounter hazardous debris such as broken glass, medical waste, an unknown liquid, etc. In the event they encounter a hazard, they are expected to mark the area with a red “hazard” flag and immediately report their find to the Team Leader. Hazards will be recovered by supervisors and team leaders only.

- Understand the potential for and preventing dehydration, overexertion, sunstroke, sunburn and bug bites. Volunteers should stop and rest as needed, drink plenty of water throughout the day and continuously apply/reapply sunscreen and bug repellant as needed based upon environmental conditions.

- Understand the “three points of contact” rule. Anytime volunteers are getting in and out of a boat, truck, vehicle or any other conveyance, they should at all times have body contact with something stable within their movement zone. The “three points” can be a combination of their hands, feet or their body in a sitting position.

- Understand and be able to identify the different types of potential hazards that may lead to slips, trips and falls. The group will be briefed by the Senior Supervisor as to the overall description of the terrain and any particular challenges they may encounter.

- Understand the general layout of the clean-up area based on the colored-grid system and the team concept and how that applies to the corresponding colored ropes that mark each team's clean-up area.

- Know the procedure for proper ingress/egress into the clean-up site using pre-determined trails that are clearly marked with trail tape.

- Know the day's expected weather conditions or anticipated weather changes so as to dress and prepare accordingly. The group will be briefed as to any expected weather changes, such as wind, rain, lightning, etc.

- Understand the general timeline of the day's activities, such as lunch and snack breaks and completion times. This will be announced by the Senior Supervisor, and will be determined based on site-specific conditions such as the number of volunteers, the amount of debris to be cleaned up, the area of the clean-up site, etc.

- Understand the buddy system. That means that a volunteer will never be alone on a clean-up site and will always be within sight of another volunteer.

- Know what type of tools, clothing and PPE is available and in what types of situations they are to be used. Each Team Leader will assist their volunteers in selecting the appropriate items based on their particular task and clean-up area.

- Understand that it is mandatory that PPE and protective clothing must be worn at all times when on site.

Work-Plan Meeting

Following the safety-plan meeting all volunteers and supervisors will be briefed by the Senior Supervisor regarding basic tasks and tools needed at the site-specific, work-plan meeting. At this meeting, it should be stressed that volunteers are encouraged and expected to ask questions of the supervisors and Team Leaders at any time before or during any clean-up activities. At a minimum, each volunteer should understand:

- The general concept of the clean-up and operating procedures.

- The work tasks and methods used to clean-up debris.

- Their individual responsibilities and the proper methods used to accomplish them.

- The clean-up site layout and how each area works together.

Notes:

CHAPTER 8: ENTRY FOR DEBRIS COLLECTION

How to safely collect, handle and transport debris for debris identification and sorting

Following the safety and work-plan meetings, each team will head to the materials/tools/PPE area to gather the appropriate items they will need to complete their assigned tasks. Once all of the team members are outfitted with the appropriate PPE and have their tools, the Team Leader will distribute color-coded debris retrieval buckets that match their team color. For instance, the blue team will be given blue buckets, the yellow team will receive yellow buckets, etc.

After all of the team volunteers have received their tools, PPE and buckets, the group will follow the Team Leader down the marked trail to their assigned clean up area. As they walk along the well-marked trail, the Team Leader will point out any potential hazards or obstacles they might encounter. Once they arrive at their assigned clean-up area, the area will be marked off along the ground with colored rope that corresponds to the team color (e.g., the yellow team's area will be marked off with yellow rope).

Once the team arrives at their clean-up area, the Team Leader will highlight any site-specific hazards that were discovered or marked during the site reconnaissance/layout, provide details regarding the layout/size of the clean-up area, demonstrate the use of any tools that they will be using and explain the use of color-coded flags. The Team Leader will then handout small colored flags that correspond with the team's color to each of the volunteers. The volunteers will also receive a few small red flags. Should a volunteer encounter any hazardous debris, they are to mark that area with a red flag and immediately alert the Team Leader, who will then remove the hazardous debris and place it in a red "hazard" bucket, or in extremely hazardous situations, the area will be marked off using high-visibility fencing. The team-colored flags will be used to mark the exact location that they stopped cleaning, should a volunteer need to take a break, stop for lunch, or have to leave the clean-up area for any reason. This will make it very easy for the volunteer to return to the exact spot when they resume cleaning activities.

Under the direction of the Team Leader, the clean-up volunteers will line up side-by-side. The space between each clean-up volunteer will be determined by the number of volunteers, the amount of area to be covered and the denseness of the vegetation and the terrain. The Team Leader will also place clean-up volunteers based upon their skill

level and physical capabilities/limitations, etc. The volunteers with the greatest skill level and physical capabilities will be assigned to the more challenging terrain, while those volunteers with lesser experience and physical capabilities will be assigned to areas with a minimum of physical challenges. These volunteers will be outfitted with appropriate PPE /clothing and clean-up tools.

The clean-up team will slowly and methodically move together in a straight horizontal line as they traverse across the well-marked clean-up area. As they move forward, each volunteer will pay special attention to any hazards both on the ground and above the ground as they carefully search their assigned area for micro-marine debris. Once their color-coded buckets become full with debris, it will be transported to the debris identification and sorting station.

If a large number of clean-up volunteers are available, the Team Leader may choose to assign the job of Runner to one or two volunteers. Their job will be to transport full buckets of debris to the debris identification and sorting station, where the buckets will be emptied and returned to the Runner. The Runner will then follow the well-marked trail back to their clean-up area, where the empty bucket will be returned to the appropriate clean-up volunteer. If there are not enough volunteers for the job of Runner to be assigned, it will be each clean-up volunteer's responsibility to mark where they stopped cleaning with a team colored flag and then transport their debris-filled bucket to the debris identification and sorting station, where it will be emptied.

Cleaning up micro-marine debris is a time-consuming, laborious process. It is important that volunteers work in a horizontal line to thoroughly and methodically sift through the vegetation, detritus and other ground-covering material. The amount of area covered will be determined by the type of terrain, the density of the micro-debris, the number of clean-up volunteers available, and the weather.

Sifting and debris recovery methods may include but not be limited to using:

- Different types of rakes to pull ground-cover material debris toward the clean-up volunteer. The volunteer should rake a couple of inches at a time, working from the top of the debris pile to barren soil, all the while picking out the debris and placing it in their bucket as they move along.

- Debris tongs to grab individual pieces of debris.

- Gloved hands to pick up debris.

- Rakes in conjunction with shovels to simultaneously scoop up debris.

- Small sand sifting shovels to recover brittle or small debris.

- Hoes to pull apart or move heavier mixes of materials that contain sand and shell.

- Debris hooks with and without telescoping handles to reach difficult or narrow places.

- Stick magnets to retrieve small, decomposing metal pieces.

- Pitch forks to pull open or turn over large, porous debris piles.

- Different cutting tools such as loppers, bolt cutters, safety knives, cable cutters and cutting pliers to cut through difficult items as necessary.

- Fine-mesh, hand-held dip-net to recover brittle or small debris on the benthic submerged bottom or suspended in the water column.

- Saws and hand-powered tools to select cut vegetation that may have debris permanently attached to it. All vegetation cutting and removal should be done only at the express approval and direction of the Senior Supervisor. The Senior Supervisor needs to have all required regulatory approvals before any vegetation cutting and/or removal activities occur.

Dead, Injured or Stranded Wildlife Contact Information

Upon discovery of dead, injured or stranded wildlife, volunteers should immediately notify their supervisors. If the wildlife is still alive, do not approach it too closely. Try to gather what information you can without adding any additional stress to the injured wildlife. The Senior Supervisor should have the contact information for the dead, injured or stranded wildlife alert phone numbers. The following information should be gathered prior to calling the alert number:

- Type of wildlife.
- Status of wildlife (dead or injured) (stage of decay or type of visible injuries) (type of entanglement material).
- Geographic locations.
- GPS location if possible.
- Any visual wildlife tags, bands and or collars attached to the animal.

Communicating this information, along with any other pertinent information, to wildlife experts will allow the fish and wildlife officials to determine the appropriate response.

Personnel in Contact with Surface Water

Individuals performing clean-up tasks that cause contact with surface water should wear appropriate PPE including a Personal Flotation Device (PFD) and have a throw ring readily accessible at all times. They should also perform clean-up activities while moving against the current. Because of the turbidity created in the water column from foot movement and debris removal activities, moving against the current will provide clean-up personnel with better underwater visibility to identify submerged debris and potential hazards such as oysters, barnacles, stingrays, catfish, jellyfish, holes, rocks, etc.

Notes:

CHAPTER 9: DEBRIS IDENTIFICATION AND SORTING

How to Process Debris for Data Collection

Once a clean-up volunteer has filled their color-coded buckets with debris, the bucket should be transported to the debris identification and sorting station either by a designated Runner (if there are enough volunteers available) or by the individual clean-up volunteer.

Upon arrival at the debris identification and sorting station, the Runner or volunteer will hand their bucket to one of the people staffing the station. That volunteer will then write on their data entry sheet the area from which the debris was taken, as indicated by the bucket color. As an added precaution, the station volunteer will visually check that the bucket does not contain any hazardous debris. The contents of that bucket will then be dumped into a shallow-sided empty, plastic bin located on a table at the station.

Once the bucket has been emptied, the Runner or the individual returns with the empty bucket to the debris collection area from which it originated. It is important that this transfer is done in an efficient and timely manner, so that there are always empty color-coded buckets available so that the debris collection can continue without delay.

After the debris has been emptied out of the bucket and the debris collection area has been accurately noted on the data entry sheet, the station workers will methodically count and transfer each piece of debris into individual debris collection containers marked by type (plastic, metal, aluminum, paper/cardboard, rubber, etc.).

When sorting and counting very small pieces of micro plastics or other small debris, it is best for the volunteers to first remove and process the larger pieces of debris from the container. After that, the volunteers may want to use a hand-held counting device if they choose (see Appendix II: Inventory Sheets). If enough volunteers are available, it is ideal that two volunteers work together as a team, with one person counting and transferring the debris into the appropriate containers, while the other person records the debris information onto the data entry sheet. It is crucial that there be enough volunteers staffing this station so that the tedious and time-consuming process of identifying and sorting the debris does not create a delay in the debris removal process. If needed, clean-up volunteers may need to be pulled from other stations if it appears that a backlog is forming at the identification and sorting station. If there is an overwhelming amount of debris that needs to be processed, categorizing and counting the individual pieces debris may not be feasible. In such cases, broader categories may need to be adopted, such as sorting the debris by category, and then weighing each debris category to come up with a quantitative value.

It is important that the data entry sheet be customized specifically for each micro-debris clean-up event to collect quantitative information. The basic sheet should include the color-coded debris retrieval zone where the items were found, the type of debris by category, the number of individual pieces by debris type (when applicable) and the total weight of the debris collected by debris type. Data entry sheets can be created using spreadsheet software such as Excel and then duplicated as needed.

Notes:

CHAPTER 10: PACKAGING, TRANSPORTATION, STORAGE AND DISPOSAL

How to Package, Transport, Store and Dispose of Debris

As part of the debris identification and sorting station, there should be an area that contains several large, clear thick-mil debris packaging bags to which the various labeled (i.e., plastic, paper/cardboard, etc.) debris sorting containers can be emptied once their contents have been counted.

The debris packaging bags should be clearly labeled according to the debris they will contain, such as: plastic, metal, aluminum, paper/cardboard,“rubber, etc. This can be accomplished by placing a piece of duct tape on the outside of each bag and writing the debris type with a waterproof marker. In addition, easy-to-read signs or placards stating the debris type should be placed above each bag. The top of each bag should also be rolled open so that the debris sorting containers can be easily emptied into the appropriate bag. The debris bags should be located side-by-side with clear plastic sheeting rolled out below them so that the ground is protected in the event of an accidental spill.

It is important not to overfill the debris packaging bags because they will need to be sealed and moved at a later time. The filled bags should weight no more than 25-30 pounds each and room should be left at the top of each bag so that it can be twisted closed and sealed with duct tape. It is extremely important that the sealed bags are picked up and carefully handled when moving them from the temporary storage area to the transportation vehicles and the disposal facility. Do not drag the debris-filled bags along the ground because this may tear the bottom of the bag open.

Every station should also contain hazardous material disposal containers that are well-marked and topped with tight-sealing lids. Should any hazardous material (solid, liquid or medical) be encountered at a clean-up site, the site supervisor will transport the hazardous material using a red “hazard” bucket to the station where it will be carefully transferred to the appropriate hazardous material disposal container.

Once all the debris has been collected, stored and tightly sealed in the appropriate container or bag, it is then the responsibility of the senior supervisor and the team leaders to transport the debris to the appropriate disposal facilities. The non-hazardous debris should be taken to the local landfill where the general trash will be disposed of and where landfill personnel will further break down by category any potential recyclable materials. All hazardous materials should be transported in the appropriate sealed Hazmat disposal containers to the designated approved hazardous materials disposal facility.

Notes:

CHAPTER 11: DECONTAMINATION

Decontamination of Personnel and PPE/Clothing

The primary goals of the decontamination ("decon") station are to:

- Protect volunteers from hazardous substances that may contaminate and eventually permeate the skin, clothing, tools, vehicles or vessels used at a clean-up site.

- Protect all site personnel/volunteers by minimizing the transfer of contaminates to clean areas at the site.

- Prevent the mixing of incompatible substances.

- Protect the marine ecosystem from possible migration or spreading of contaminants off site.

The "decon" station should be located away from all other designated stations. It should also be organized as a walk-through processing station that is located adjacent to, but separate from the station. The ground in the "decon" area should be covered using a generous amount of thick plastic sheeting material that will be used to protect the soil from any accidental contamination. The "decon" station should be staffed with personnel who will focus on decontaminating volunteers, PPE and equipment as efficiently as possible in order to prevent backlogs or delays. These "decon" volunteers should be properly outfitted with the appropriate PPE at all times.

The "decon" station should include the following:

- A well-marked, clear debris packaging bag for the proper disposal of used PPE, such as latex, nitrile or rubber gloves, paper suits, paper respirators and rubber booties.

- A used tool/equipment area where contaminated items will be stored while the decontaminated clean-up volunteers visit the clean station for breaks, snacks or lunch. This area should be located well within the plastic sheeting covered area since the tools will remain in a contaminated state. Tools will not be decontaminated until the end of the clean-up event.

- A table where reusable PPE, such as safety glasses, hard hats and full-face respirators can be placed before being decontaminated using "decon" wipes.

- A table where “clean” decontaminated reusable PPE can be placed and temporarily stored while clean-up volunteers are in the clean station for break, snack or lunch. This table should be placed on the edge of the “decon” station where it will be easily accessed by clean-up volunteers who are finished with their break, snack or lunch.

- Paper towels.

- A boot/footwear-cleaning area that is equipped with two large, low-sided plastic containers. One container will contain a liquid-based environmentally-friendly cleaning solution and scrub brush, and the other will contain clean water for rinsing.

- A hand-cleaning area stocked with gel hand sanitizer and antibacterial wipes.

- Hand washing water with bucket/lid to capture the wash water.

- Well-marked areas that are cordoned off using marking tape, cones or safety fencing for easy flow through the station if a large number of clean-up volunteers are going to be decontaminated at one time.

Once a clean-up volunteer has finished working in their appointed area and are preparing to visit the clean station area to take a break, eat a snack or have lunch, they should first directly proceed to the “decon” area using the well-marked trail.

Upon arrival at the “decon” station, the clean-up volunteer should leave any tools/equipment at the appropriately marked location. They then should dispose of any PPE (such as latex, nitrile or rubber gloves, paper suits, paper respirators and rubber booties) in the well-marked clear debris packaging bag. After that, they should place any reusable PPE, such as safety glasses, hard hats and full-face respirators on the appropriately marked table where it will be decontaminated using “decon” wipes.

Once the clean-up volunteers have rid themselves of all of their tools, equipment and PPE, they should proceed to the boots/footwear-cleaning area. They will then step into the foot-washing container where their boots/footwear will be scrubbed with a cleaning liquid by the “decon” personnel. Once they have been properly scrubbed, they will then step into the second container that is filled with clean water where their boots/footwear will be properly rinsed. Once their boots/footwear are decontaminated, they will proceed to the hand sanitizing location, where they can clean/wash their hands before heading to the clean station.

After the clean-up volunteers have finished their break, snack or lunch in the clean station, they will return to the “decon” area to retrieve their reusable PPE that has been decontaminated. Once they have retrieved these items, they will return to the Materials/Tools/PPE station to receive new disposable gloves, paper suits, paper respirators, etc. as needed. They will also pick up any tools that they have left in the tool storage area at the “decon” station and return to work.

In the event of a medical emergency, the on-site supervisor, safety officer and EMT/paramedic will work as a team to decide on the appropriate emergency decontamination process for the injured/ill individual.

At the end of the day, after all of clean-up work has been completed, all volunteers will be processed through the “decon” station. At the “decon” station, the volunteers will check-in all tools, equipment, and PPE for inventory. The volunteers will then proceed to the boot/footwear-and-hand cleaning area. At this time, it is best to increase the number of boot/footwear cleaning stations so that a large number of volunteers can go through the “decon” process at one time. Volunteers will also properly dispose of any non-reusable PPE at this time.

Once all of the volunteers have been processed through the “decon” station, all of the tables, chairs, PPE, tools and equipment will need to be properly decontaminated. In addition, the polyethylene plastic sheeting will need to be gathered up and discarded into a clear packaging bag that is sealed and labeled as a “contaminated PPE.”

The contaminated or “hot” water from the containers located at the boot-cleaning area will need to be emptied in containers with tightly sealing lid and labeled as contaminated “hot” water. In addition, the clear packaging bag containing any PPE (such as latex, nitrile or rubber gloves, paper suits, paper respirators and rubber booties) and disposable “decon” wipes should be marked as “contaminated disposable PPE” and tightly sealed. The hand-washing water that has been captured in the bucket should be sealed with the lid and labeled as “used hand-washing water.” After all of the items have been decontaminated or properly sealed in the appropriate debris bags and buckets, they can then be transported for proper disposal/recycling.

Notes:

CHAPTER 12: POST-EVENT INVENTORY AND DEBRIEFING

Inventory

Once all of the tables, chairs, PPE, tools, first aid materials and equipment have been properly decontaminated, it is important that a full inventory of the items be taken. By using the inventory checklist that was created prior to the clean-up activities, the volunteer supervisors can systematically go down the list and account for all of the items that were used during the effort. This will help ensure that no items are accidentally left behind at the clean-up site and/or that any of the volunteers have forgotten to return something. After all of the equipment and materials are accounted for, they can now be properly packaged, transported and stored for future use.

Site Walk Through

Before leaving the clean-up site, it is crucial that the Senior Supervisor and additional supervisors do a final walk through of the area to ensure that the site is left in an unspoiled and improved manner.

Debriefing

The purpose of the debriefing is to gather input for suggested improvements that were noted during the clean-up activities. This information can be gathered both orally and in writing. Following the day's activities, and before they depart, it is crucial that the Senior Supervisors and key personnel gather to discuss any particular concerns, challenges and problems that they encountered. At that time, solutions to these problems should be written down to help improve further clean-up activities. These written summaries can then be added to the clean-up training manual and used for future reference.

It is also important to gather input from the volunteers who participated in the clean-up activities. They will be able to provide insights from their perspective. The easiest way to gather this information is through a written evaluation form that each volunteer can fill out anonymously and hand-in at the end of the day's activities. The forms should be handed out once the volunteers have been decontaminated. The form should be short and to the point and basically ask, "What could we have done better?" There should be a suggestion box on site where these forms can be dropped before the volunteers leave for the day.

At end of the day, these suggestions can be read and discussed by the Senior Supervisor and support staff at their debriefing meeting. This input should prompt discussion about possible improvements that can be made to help future volunteers do their job better. Based on this input, additions or deletions should be made to the clean-up manual so that they can be utilized in the future.

Notes:

CHAPTER 13: VOLUNTEER AND MEDIA OUTREACH

Volunteer Outreach

Well-trained volunteers are crucial to the success of any micro-marine debris clean-up activity. The number of volunteers needed depends upon the size of the clean-up area and the density of the micro-marine debris at the site.

Almost any school or community club, organization or individual can serve in a volunteer capacity as part of a clean-up effort. The only requirement is that they share a desire to improve their community and the environment. Potential sources for volunteers and contact information include but are not limited to:

- Local/regional environmental groups and organizations.
- Federal/state/regional/local government organizations with public outreach offices such as National Marine Fisheries Service, U.S. Fish and Wildlife Service, national or state parks, water management districts, watershed governing bodies, beaches and shores, etc.
- Middle or high school environmental clubs or classes (the clean-up activity may count towards class credit or community volunteer hours).
- Scouting organizations (the clean-up activity may count towards a particular badge or ranking).
- Community service organizations.

Another great resource is the Keep America Beautiful website located at www.kab.org. The mission of Keep America Beautiful is “engaging individuals to take greater responsibility for improving their community environments.” As a result, they have a network of more than 1,200 local affiliates and participating organizations which are organized and listed by state. By searching this database, there is a good chance that environmentally-oriented organizations in your area can be identified.

After identifying the potential groups or organizations to be targeted for volunteer participation, it is important that a thorough background research is done regarding their particular mission and goal objectives. This will enable the customization of the presentation or “pitch” to be tailored to that specific audience. Creating the pitch with attention to every detail will provide the best chance for a positive response. For example, if the group being targeted is the Boy Scouts, the “pitch” may include information on how the scouts may earn a particular badge for participating in the event.

It is also important to communicate to the group/organization the positive recognition and media exposure their organization may receive by participating in the event. Additionally, the more full-service, itemized logistics that can be provided, such as clean-up tools, transportation, food and beverages, etc., the better the perception is of "all we have to do is show up." This will encourage target audience participation. By customizing the "pitch" to a target audience, communicating the potential benefits of participating in the event, and having the "pitch" ready to deliver in a variety of formats (oral, printed, web-link or in-person) will greatly increase the success rate for a positive response and participation.

Media Outreach

In addition to volunteer organizations, another key audience that needs to be identified, targeted and communicated with is the news media or "press." This audience includes but is not limited to the editors and reporters for newspapers, magazines, radio stations, television news programs and internet blogs/magazines.

The goal of targeting and communicating with the press is to get them to attend, possibly participate in, and report about the micro-marine debris clean-up event in a positive manner. The ultimate outcome of this effort is to have the press inform and educate their audiences about the most common sources of marine debris (i.e., recreational boaters and fishermen, shoreline residents and tourists), the impact littering has on the environment, and how to prevent future negative impacts.

The first step in any media outreach effort is compiling a press list that identifies and targets individual reporters, television and/or radio shows, magazines, blogs, etc., that focuses on or does stories about marine activities, the environment and community outreach efforts. It is important to ask the head of any volunteer organization that is going to participate in the planned clean-up effort if they have a press list or any established relationships with any media that they would be willing to share. If so, these media contacts should be added to your press list. The press list should include the name of the editor/reporter, the name of the organization for which they work, their phone number, fax number, email address and physical office address.

Once a working press list is developed, the next step in the media outreach effort is to write a press release that provides the basic information about the event, along with contact information. The press release should also include a link to any web-based material describing the upcoming the micro-marine clean-up event. After the press release has been written and reviewed, it should be sent to the editors/reporters on the targeted press list. The press release can be mailed, faxed, emailed or hand-delivered (or any combination of these distribution methods). It is crucial to follow up with the editor/reporter via a phone call, so that you can "pitch" or "sell" to them the reasons they

should attend and write a story about the event. It is important to communicate that the event is going to be well planned, easy to cover, supported with easy-to-understand print materials that will include “fun facts” or statistics they can use in their story, and that they can either participate in the clean-up activities themselves or interview clean-up volunteers as to their experience.

Ideally, whoever has been handling pre-event press relations should also be responsible for assisting the press the day of the clean-up event. Once the press arrives, they should be given a “Press Badge” to wear, introduced to the senior supervisors and team leaders, and escorted during the event. The job of the press relations person is to assist the reporters with any needs they might have (i.e., setting up interviews, photo opportunities, providing them with support statistics and material, etc.). It is also important for the press relations person to continually stress the key “talking points” and purpose of the day’s events, which is to educate to public about the main sources of marine debris, the impact it has on the environment, and how to prevent additional debris from entering the environment. Following the event, it is also important that the event press relations person be available via cell phone to answer any last-minute questions the reporters might have regarding the event. (e.g., total number of volunteers, amount of debris collected, etc.).

Notes:

CHAPTER 14: REGULATIONS

Importance of Contacting Governmental and Regulatory Agencies

For any micro-debris clean-up it is prudent to query federal, state, regional, district or local authorities for permitting or activity notification requirements. Clean-up sites may have single or multiple regulatory jurisdictions over them. These regulatory jurisdictions will be specific to each micro-debris clean-up effort and location.

In addition, solid waste or recycling centers should be contacted to determine their working hours, fees, or specific delivery or packaging requirements.

Notes:

APPENDIX A: GLOSSARY

Explanation of Terms

Barnacles: A marine shellfish or crustacean that attaches itself to items found in the marine environment.

Benthic: Relating to or occurring at the bottom of a body of water.

Biological hazards: An organic source that may cause danger, risk or loss.

Camouflaged: To conceal, disguise or hide.

Catfish: A commonly found fish that has hazardous sharp barbs.

Clean Station: A designated area that is hazard free and not dangerous to people or the environment.

Clean-up: The process of removing, treating or disposing of contaminant at a site and restoring the site to a condition that is not dangerous to people or the environment.

Compost Pile: A mixture of decomposing matter.

Debris: Fragments of scattered remains.

Decon: Slang for decontamination.

Decontamination: To make safe by removing contamination.

Detritus: Loose fragments of disintegrated material.

Disposable: Something that can be thrown away.

Disposal facility: An area that is built to specifically receive items that can be thrown away.

Ecosystem: A specialized community including all the component organisms that forms an interacting system.

Emergency: A situation or occurrence of a serious nature that develops suddenly and unexpectedly and demands immediate action.

Emergency Decontamination: An immediate decontamination treatment and response action to someone who has been harmed.

Emergency response: A response action to situations that may cause immediate and serious harm to people or the environment.

EMT: Emergency Medical Technician.

Environment: Totality of conditions surrounding an organism.

EPA: Environmental Protection Agency.

Eye poppers: Slang for the sharp tips of tree limbs.

Fish barbs: Sharp barbs commonly found on fish.

GPS: A hand-held Global Positioning Satellite instrument that provides exact location.

Habitat: The region or environment where a plant or animal is normally found.

Hazard: Danger, risk or loss.

Hazardous: Exposed to or involving a danger, risk or loss.

High water: The location of a body of water at its time of highest elevation.

Hot water: Slang for contaminated water.

Ignition sources: a device that activates a spark.

Jellyfish: A marine organism of jelly-like substance having tentacles.

Kevlar: High-strength protective material.

Lagoon: A body of shallow water separated from the ocean by an island.

Landfill: A location for the disposal of waste on land designated to protect the public and environment from hazards.

Macro: Large.

Marine debris: Fragment of scattered remains found in a saltwater aquatic environment.

Marine life: A living organism or plant found in a marine environment.

Meat Hook: Slang for a short, sharp protruding object.

Meso: Medium-sized.

Micro: Extremely small.

Micro-plastics: Pieces of plastics smaller than 5mm long.

Migration: The movement of contamination.

NOAA: National Oceanic and Atmospheric Administration.

OSHA: Occupational Safety and Health Administration.

Osprey: A type of bird, also known as a “Fish Hawk,” that preys upon fish.

Oysters: A bivalve mollusk found on rocks in shallow water.

Paramedic: A member of an ambulance crew who is trained in a number of life-saving skills.

PFD: Personal Flotation Device.

Pitch: Slang for a proposal presentation.

PPE: Personal Protection Equipment.

Recyclable: Reusable material captured from a waste or debris source.

Reusable: Able to be used more than once.

Runner: Slang for a person who transports material and items to and from different locations.

Shoreline escarpments: A sharp incline or ridge found along a shoreline.

Spoil Island: An island that is manmade.

Stingray barbs: The hazardous sharp point found at the base of a stingray’s tail.

Storm water: An abnormal amount of surface water usually due to a large amount of rain.

Submerged: Beneath the surface of the water.

Tag: A piece of attached material with identifying information printed on it.

Thick mil: Slang for a measurement of thick plastic sheeting.

Throw ring: A circular flotation device designed to be thrown to a person who is in the water.

Turbidity: Suspension of foreign particles in the water column.

Vegetation: Plant life.

Warning signs: Evidence that may indicate the possibility of danger.

Wetlands: Land that has wet characteristics and is considered part of an ecological system.

Widow maker: Slang for dead vegetation that has become lodged or lightly attached to other vegetation and when that vegetation is disturbed the “widow maker” becomes detached and unexpectedly falls to the ground.

Wildlife: Wild animals in their natural environment.

APPENDIX B: INTERNET RESOURCES

Government Agencies

Florida Department of Environmental Protection
Florida Coastal Management Program: http://www.dep.state.fl.us/cmp

Occupational Safety and Health Administration
http://www.OSHA.gov

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
Marine Debris Program: http://marinedebris.noaa.gov/

U.S. Environmental Protection Agency
Marine Debris: http://water.epa.gov/type/oceb/marinedebris/index.cfm

Private Organization

Marine Affairs Research and Education
Marine Debris Info: http://marineaffairs.org/marinedebris.html

Marine Debris Solutions: http://marinedebrissolutions.com/

Ocean Conservancy
Trash Free Seas: http://www.oceanconservancy.org/our-work/marine-debris/

APPENDIX C: INVENTORY SHEETS

Sample Data Identification Sheet

Date: June 20, 2012

Data entered by: Beth Sembler **Number of Volunteers: 20**

Sheet Number: 1 **Location: Spoil Island 1**

Legend: Y=Yellow/G=Green/O-Orange/B=Blue

Plastic	Styrofoam	Metals/ Aluminum	Paper/ Cardboard	Rubber	Cloth/ Polyester	Hazardous
54 Y						
22 R						
13 O						
12 B						

Sample Debris Inventory Sheet

Date: June 20, 2012

Data entered by: Beth Sembler **Number of Volunteers: 20**

Sheet Number: 1 **Location: Spoil Island 1**

Plastic	Styrofoam	Metals/ Aluminum	Paper/ Cardboard	Rubber	Cloth/ Polyester	Hazardous
5	5	23	2	4	5	1
24	3	1	4	3	4	0
16	8	4	5	6	3	4
24	6	5	22	1	2	2
44	5	6	1	3	7	0
25	7	6	4	5	5	1
15	2	7	6	2	6	1
Total pcs.	Total pcs.	Total pcs.	Total pcs.	Total pcs.	Total pcs.	Total pcs.
113	36	52	44	24	32	9
Weight	Weight	Weight	Weight	Weight	Weight	Weight
2	.5	1.5	.75	.5	2.0	.75