

# Field Guide for Vessel Grounding Rapid Assessment

## Preliminary Information Checklist

Please fill out this [online form](#)<sup>1</sup> that includes the following pertinent information.

- |  |  |
|--|--|
| <input type="checkbox"/> Vessel Name                     | <input type="checkbox"/> Grounding Cause |
| <input type="checkbox"/> Location                        | <input type="checkbox"/> Vessel Material |
| <input type="checkbox"/> Description of Environment      | <input type="checkbox"/> Vessel Type     |
| <input type="checkbox"/> Presence of sensitive habitat   | <input type="checkbox"/> Condition       |
| <input type="checkbox"/> Presence of protected resources | <input type="checkbox"/> IUU Activities  |
| <input type="checkbox"/> Historic Site                   | <input type="checkbox"/> Size (tons)     |
| <input type="checkbox"/> Gravesite Status                | <input type="checkbox"/> Propulsion Type |
| <input type="checkbox"/> Owner Insurance                 | <input type="checkbox"/> Flag            |

## Field Equipment/Supplies

Refer to the [CRAG Response Kit Inventory](#)<sup>2</sup> for all agencies' current supplies

- Underwater slates/clipboards, pens/pencils, and sketch/gridded data sheets on waterproof paper.
- Rubber bands or clips to fasten the sketch/data sheets to the clipboard.
- Fiberglass (weighted) measuring tapes, 25, 50, and 100 m as needed.
- Video or still camera with underwater housing, with instruction manual.
- Small weighted plastic ruler tied to the clipboard or attached to your wrist.
- Hand-held GPS unit in waterproof pouch or floating bag, compass, waterproof watch.
- Eyebolt stakes, epoxy, rock drill, and buoys.
- PVC angle indicator device (see Fig. 1)

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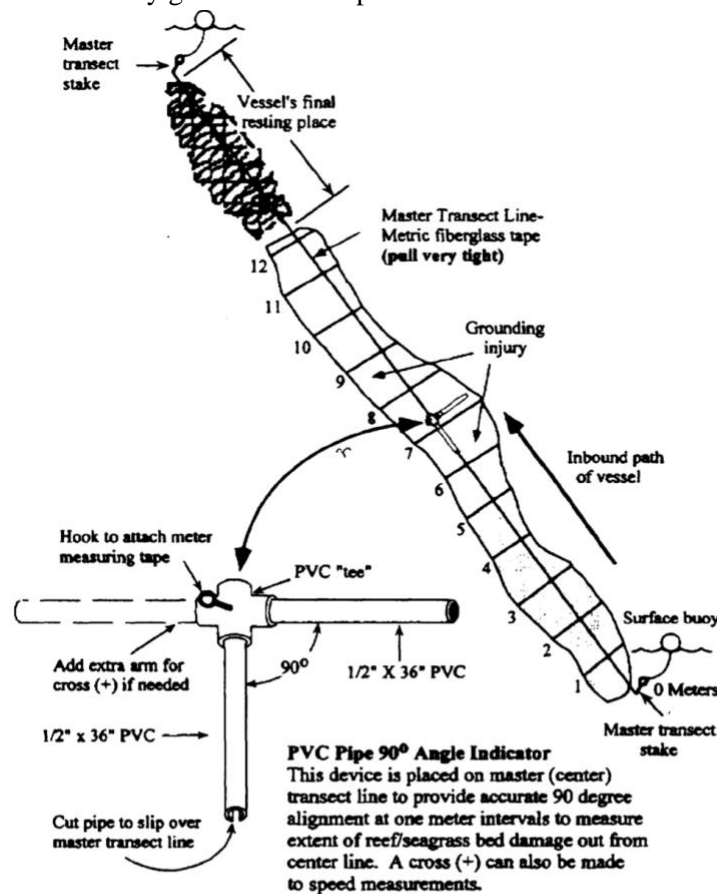
<sup>1</sup>[https://docs.google.com/spreadsheets/d/1ZIMiyI\\_TqJQrNrpWxhs53DuBDo92CyEFherwA8xRhU/edit?gid=0#gid=0](https://docs.google.com/spreadsheets/d/1ZIMiyI_TqJQrNrpWxhs53DuBDo92CyEFherwA8xRhU/edit?gid=0#gid=0)

<sup>2</sup>[https://docs.google.com/spreadsheets/d/1BlckLeZVp8kOzRCLS6db\\_x0iOY6ExCZKjRgKxJWHNy4/edit?gid=0#gid=0](https://docs.google.com/spreadsheets/d/1BlckLeZVp8kOzRCLS6db_x0iOY6ExCZKjRgKxJWHNy4/edit?gid=0#gid=0)

## Protocol

Adapted from Rapid Assessment Protocols for Small Vessel Groundings by Jaqueline Michel, Christine Boring, and Chris Locke at Research Planning, Inc:

1. Conduct a preliminary survey of the grounding site to identify impacted areas, habitats, and general conditions.
2. Conduct live coral triage if appropriate (see NOAA's Live Coral Triage Protocol).
3. Develop a surface site diagram and a survey grid. Consider using the "fishbone" method (see Fig. 1) to establish a survey grid over the impact area.



**FIGURE 1. "FISHBONE" GRID MAPPING SYSTEM (HUDSON AND GOODWIN, 2001).**

4. Establish a Master Transect Line along the long axis of the grounding track. Install permanent master stakes at each end (drill a 15-30 cm hole, fill with epoxy or cement, and install eyebolt stake that project at least 30 cm above the substrate) and attach buoys to them for visual reference. Collect GPS coordinates for each stake.
5. Lay out a metric fiberglass measuring tape along the Master Transect Line, using temporary attachment points as needed to hold it in place, follow curves in the track, and keep it tight. Record the distance and compass headings of each leg of the Master Transect Line. Place the PVC angle indicator on the tape, starting at one end of the Master Transect Line. At 1-2 m

intervals (depending on the size of the impact area), use a smaller tape measure hooked to the top of the device to measure and record the distance to the edge of the damaged area, on both the left and right of the Master Transect Line.

6. Create a grid-map by plotting the dimensions of the impact area on grid paper, scaling the grids (to become quadrats at the site) to 1 or 2 m<sup>2</sup> as appropriate for the site. Assign each grid a location code, even partial ones at the edge of the impact area. Consider the following coding system.
  - First value = distance along the start of the Master Transect Line in meters (e.g., 1, 2, 3)
  - Second value = direction as either left (L) or right (R) from the Master Transect Line
  - Third value = number of the grid in order of distance from the Master Transect Line
7. For example, the first grid at 3 m along the Master Transect
8. Line, on the right side, = 3R1.
9. Develop site-specific injury classification categories to reflect the types of physical injuries at the site. Write detailed definitions of each category. Modify the following categories for coral habitat as appropriate using a numerical coding system. For example, A5 would indicate minor amounts of crushed coral that was still intact.
  - Minor = A; Major = B
  - 1 - Rubble/sediment deposits
  - 2 - Scars and hull paint
  - 3 - Dislodged corals
  - 4 - Dislodged octocorals and sponges
  - 5 - Corals crushed, fractured, or fragmented, but still intact
  - 6 - Corals crushed, fractured, or fragmented, in pieces
  - 7 - Reef structure damage
10. Develop appropriate injury categories for seagrass and hard bottom habitats.
11. Prepare a datasheet on waterproof paper for recording observations at each quadrat/grid. The parameters to be recorded could include the following:
  - Quadrat ID
  - Date + start/end time
  - Observer
  - Injury classification code for Coral
  - Injury classification code for Seagrass
  - Injury classification code for Bivalves.
  - Photo /video time stamp
  - % of each injury class in quadrat
  - % coral cover
  - # of coral species/genus
  - % cover octocorals and sponges
  - Mean size of coral (can use size intervals)
  - Largest coral size, species/genus, injury code for this largest coral
  - Debris items (list number, percent cover, and/or type)
12. Synchronize the diver's watch time with the time on the underwater camera (video or still). By recording both start and end time for each quadrat, the time stamp on the image can be used to assign images to each quadrat.

13. Conduct the initial injury assessment survey, using the Master Transect Line, the PVC angle device, and two shorter measuring tapes to layout each the quadrats in the impact area.
14. Prepare a legend sheet for the injury categories and codes (as well as any other categories being used, such as coral size or % cover intervals) on waterproof paper for reference during observations.

These are preliminary guidance documents for initial assessment and do not replace expert judgment and experience on how to assess or triage a site. Not all grounding sites warrant or benefit from emergency assessment and restoration activities. Before initiating substantial effort in coral assessment or triage, the agencies involved should carefully evaluate the situation.

### **Salvage Operators Previously Used in AS**

1. T&T Salvage
  - Worked on Ji Hyun Aunu'u grounding removal.
2. Solar Inc.