

FIELD PROTOCOLS FOR NRDA**Salt Marsh Reconnaissance****Objectives**

- To provide guidance on conducting a preliminary reconnaissance of salt marshes
- To estimate the areal extent and degree of oiling and vegetation impact
- To obtain preliminary information to help evaluate the need for more comprehensive studies

Parameters

- Extent and degree of oil on vegetation and substrate
- Plant species composition
- Qualitative vegetation condition
- Degree of cleanup-associated disturbances

Equipment

- 4 ft stakes (two per transect)
- hammer or mallet to drive stakes in
- profile rods (two, 1.5 m long, 2 cm intervals)
- 30 m fiberglass tape measure, marked in cm
- GPS
- compass
- hand level
- calculator
- field notebook (water-proof paper)
- pencils
- percentage estimation charts
- shoreline terminology code list
- marsh oiling datasheets (attached)
- plant identification guides
- 35 mm cameras, video camera
- film, video tapes
- photo scales
- photo log forms
- zip lock bags for vegetation specimens
- chain of custody forms and labels
- 8 oz. precleaned glass jars and equipment for sediment and oiled vegetation samples
- cooler and ice
- aerial photography guidelines
- shoreline assessment survey guidelines (incl. profile rod instructions)
- shovel and/or coring device
- sediment sampling guidelines

Methods**Reconnaissance Activities**

- Conduct an overflight of the entire affected area within two hours of low tide (before or after), to observe the extent of visible contamination. Use USGS 7.5 minute topographic quadrangles, vertical aerial photographs, or other detailed maps to record observations. Note the:
 - locations and approximate lengths of oiled vegetation segments
 - approximate width and degree of oiling along different segments of shoreline
 - obvious vegetation zonation
 - access points, major landmarks, and locations for ground-truth and reference stations
 - all photographs taken
- Conduct a preliminary ground survey to determine the potential magnitude of vegetation injury. Look first at the sites with the highest severity of oiling and disturbances from cleanup. Make a rough estimate of the acres of vegetation with different degrees of potential injury. Then decide if further assessment activities are needed.

Estimating Areal Extent of Oiling

- If there is significant visible oiling of the vegetation, obtain vertical aerial photography of the impacted area. The photographs can be used to generate updated basemaps (esp. important in areas with high rates of shoreline change). See references for how to order an aerial photography mission.
- Conduct a systematic ground survey of the entire area of oiled vegetation. Use color copies of the aerial photographs to:
 - delineate the areas of oiling categories on the vegetation. Usually, up to three different categories are delineated and defined using objective descriptors (e.g., height and percent cover of the oil band on the vegetation)
 - delineate vegetation types
 - delineate areas affected by different types of response disturbances
 - verify the oiling category and measure the dimensions of areas which are not clear on the aerial photographs (e.g., covered by shadows)

Obtaining Preliminary Information on Vegetation Impacts

- It may be appropriate to establish stations at sites representative of the different vegetation types and oiling conditions, to provide preliminary data to assist in evaluating the need for and design of more comprehensive studies. Consider the following factors in site selection:
 - as time and available personnel permit, stratify sites by level of oiling and response-related disturbance
 - in all cases, examine reference sites with no observed oiling
 - consider degree of exposure (to waves, boat wakes, currents), water salinity, and other sources of variation when choosing oiled and reference sites
 - consider access (to facilitate follow-up, but also to avoid areas likely to be disturbed by human activities)
 - if the results are to be used to support quantification of impacts to the vegetation, a detailed and rigorous study design is required
- When establishing ground stations:
 - record station location using a GPS unit, but also accurately plot the station on a map or aerial photograph
 - permanently mark station locations using “front and back” stakes which line up along the transect lines, and consider stake placement carefully to minimize loss to vandalism, erosion, ice-scouring, etc.
 - record the transect angle with a compass so it can be re-surveyed at a later date, even if one stake is lost; note whether the angle reading is magnetic or corrected to true north
- At each ground station, run transects within two hours of low tide (before or after). Run transects perpendicular to the shoreline from the upper edge of the marsh to its seaward extent, covering the entire width of oiling. Modify the attached form, as needed for the spill conditions, but make sure to complete all entries.
- Along each transect, use standard oiling terminology codes and estimation charts (see references, attachments) to record the following for each interval:
 - distance of the interval
 - plant species present
 - plant condition, including death or discoloration
 - vertical oil interval, oil thickness, and % oil cover on the vegetation

- oiling type description and % cover on the substrate
 - depth of oil penetration into the sediments , if any (using a shovel or coring device)
 - sediment type (grain size)
 - type and extent of plant or substrate disturbance such as trampling, cutting, burning, erosion, etc.
 - presence, condition, and/or altered behavior of visible biota such as snails, crabs, etc.
- If time and personnel permit, topographic profiles can be conducted along the transects. Profiles are useful due to the strong influence topography has on vegetation and oil distribution. Make the transect intervals short enough to represent the topography of the site and changes in the plant community, but no longer than 3 m apart so that topography is accurately recorded. At each interval, record horizontal distance and change in elevation using the profile rods, tape measure, and hand level (see references).
 - Photo document each station. Photograph all collection sites prior to sampling. Use a GPS photo tracking program that links GPS data (by time) with photographs (available programs include Garmin MapSource used in connection with GPS Photo-Link). All photos or videotape should be described in the photo log, located on a simple sketch map of the site, and noted on the data sheet. Photos or videotapes should include:
 - the general station location and setting, showing permanent stakes
 - examples of plant zonation and condition along the transect,
 - sites where samples were collected
 - representative examples of the extent and degree of oiling
 - the extent and degree of trampling, burning, or other disturbance in the area
 - examples of services provided by the marsh (animal use, shoreline protection, etc.).
 - Collect vegetation samples in impacted and reference areas, as needed. Oiled samples can be used to fingerprint the oil or measure the amount of oil on the vegetation, which can be used in mass balance analyses. Place oiled samples in a pre-cleaned glass jar and place on ice in a cooler while in the field. Transfer to a freezer at the end of each day. Vegetation samples for confirming plant species identifications should be collected from unoiled areas, if possible, and can be placed in plastic bags.
 - Take sediment samples, particularly in areas where vegetation impacts are visibly obvious. If impacted areas are sampled, sediments from reference areas should also be collected. See the field sampling protocols for intertidal sediments for guidelines.

References

- Dalby, D.H., 1987, Salt marshes, Chapter 3: in J.M. Baker and W.J. Wolff (eds.), Biological Surveys of Estuaries and Coasts, Estuarine and Brackish Water Sciences Association Handbook, University of Cambridge Press, Cambridge, UK, pp. 38-80.
- NOAA Damage Assessment Center, 1997, Field forms and codes. Appendix 6: in Natural Resource Damage Assessment Emergency Guidance Manual, Version 3.1. NOAA Damage Assessment Center, Silver Spring, MD.
- Research Planning, Inc., 1997, Extent of oiling of wetlands, JULIE N oil spill, Portland, Maine. Report prepared for the JULIE N Trustee Council. Research Planning, Inc., Columbia, SC, RPI/R/97-2.
- Research Planning, Inc., 1997, Guidelines for planning and contracting aerial photographic missions. Prepared for the NOAA Damage Assessment and Restoration Program, Silver Spring, MD, 15 pp. + two appendices.

Edited 04/30/10 jrp/wbd