

DWH SETTLEMENT COMMUNICATION

Deepwater Horizon/Mississippi Canyon 252 Spill

Addendum to the **Sampling and Monitoring Plan for the Assessment of MC252 Oil Impacts to Coastal Wetland Vegetation in the Gulf of Mexico**

Approval of this work plan is for the purposes of obtaining data for the Natural Resource Damage Assessment (NRDA). Each party reserves its right to produce its own independent interpretation and analysis of any data collected pursuant to the work plan.

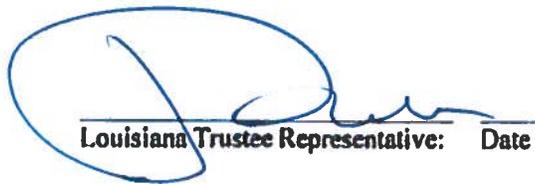
Each laboratory shall simultaneously deliver raw data, including all necessary metadata, generated as part of this work plan as a Laboratory Analytical Data Package (LADP) to the Trustee Data Management Team (DMT), the Louisiana Oil Spill Coordinator's Office (LOSCO) on behalf of the State of Louisiana, the Mississippi Department of Environmental Quality (MDEQ) on behalf of the State of Mississippi, the Alabama Department of Conservation and Natural Resources (ADCNR) on behalf of the State of Alabama, and to BP (or Cardno ENTRIX on behalf of BP). The electronic data deliverable (EDD) spreadsheet with pre-validated analytical results, which is a component of the complete LADP, will also be delivered to the secure FTP drop box maintained by the Trustees' Data Management Team (DMT). Any preliminary data distributed to the DMT shall also be distributed to LOSCO, MDEQ, ADCNR, and to BP (or Cardno ENTRIX on behalf of BP). Thereafter, the DMT will validate and perform quality assurance/quality control (QA/QC) procedures on the LADP consistent with the authorized Analytical Quality Assurance Plan, after which time the validated/QA/QC'd data shall be made available simultaneously to all Trustees and BP (or Cardno ENTRIX on behalf of BP). Any questions raised on the validated/QA/QC results shall be handled per the procedures in the Analytical Quality Assurance Plan and the issue and results shall be distributed to all parties. In the interest of maintaining one consistent data set for use by all parties, only the validated/QA/QC'd dataset released by the DMT shall be considered the consensus dataset. In order to ensure reliability of the consensus data and full review by the parties, no party shall publish consensus data until 7 days after such data has been made available to the parties. Also, the LADP shall not be released by the DMT, LOSCO, MDEQ, ADCNR, BP or Cardno ENTRIX prior to validation/QA/QC absent a showing of critical operational need. Should any party show a critical operational need for data prior to validation/QA/QC, any released data will be clearly marked "preliminary/unvalidated" and will be made available equally to all trustees and to BP (or Cardno ENTRIX on behalf of BP). This plan will be implemented consistent with existing trustee regulations and policies. All applicable state and federal permits must be obtained prior to conducting work.

All materials associated with the collection or analysis of samples under these protocols or pursuant to any approved work plan, including any remains of samples and including remains of extracts created during or remaining after analytical testing, must be preserved and disposed of in accordance with the preservation and disposal requirements set forth in Pretrial Orders ("PTOs") # 1, # 30, #35, # 37, #39 and #43 and any other applicable Court Orders governing tangible items that are or may be issued in MDL No. 2179 IN RE: Oil Spill by the Oil Rig "DEEPWATER HORIZON" (E.D. LA 2010). Destructive analytical testing of oil, dispersant or sediment samples may only be conducted in accordance with PTO # 37, paragraph 11, and PTO # 39, paragraph 11. Circumstances and procedures governing preservation and disposal of sample materials by the trustees must be set forth in a written protocol that is approved by the state or federal agency whose employees or contractors are in possession or control of such materials and must comply with the provisions of PTOs # 1, # 30, # 35, 37, #39 and #43.

Addendum to the Sampling and Monitoring Plan for the Assessment of MC252 Oil Impacts to Coastal Wetland Vegetation in the Gulf of Mexico

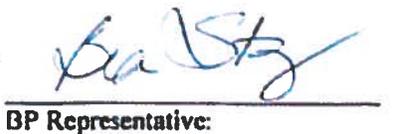
Protocol for Fall 2013 Sampling and Monitoring for the Assessment of MC252 Oil Impacts to Coastal Wetland Vegetation in the Gulf of Mexico

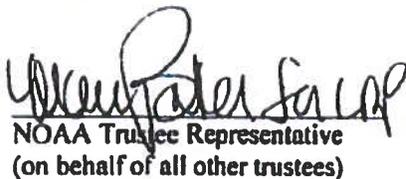
APPROVED:

 10/23/13
Louisiana Trustee Representative: _____ Date

 10/10/13
Mississippi Trustee Representative: _____ Date

 10/13/13
Alabama Trustee Representative: _____ Date

 9/17/2013
BP Representative: _____ Date

 9/18/13
NOAA Trustee Representative _____ Date
(on behalf of all other trustees)

Deepwater Horizon/Mississippi Canyon 252 Spill

Addendum to the Sampling and Monitoring Plan for the Assessment of MC252 Oil Impacts to Coastal Wetland Vegetation in the Gulf of Mexico

Protocol for Fall 2013 Sampling and Monitoring for the Assessment of MC252 Oil Impacts to Coastal Wetland Vegetation in the Gulf of Mexico

Under the *Sampling and Monitoring Plan for the Assessment of MC252 Oil Impacts to Coastal Wetland Vegetation in the Gulf of Mexico* (Coastal Wetland Vegetation Plan), selected coastal sites in the Gulf of Mexico were sampled and monitored in order to assess the impacts of MC252 oil on coastal wetland vegetation, as well as on soil characteristics and elevation. As provided under this plan, four field events have been conducted: one in the fall of 2010, one in the spring of 2011, one in the fall of 2011, and one in the fall of 2012. Additional sites for sampling and monitoring were added to the plan through two addenda: (1) *The Addendum for the States of Mississippi and Alabama*; and (2) *The Protocol for Sampling and Monitoring Marsh Response Cleanup Areas*. The former added sites in Mississippi and Alabama, which were sampled in both the spring and fall of 2011, as well as in the fall of 2012. The latter added sites in marsh areas targeted for cleanup by the Deepwater Horizon Response effort. These response cleanup sites were largely established in February of 2011 and sampled during the spring and fall of 2011, and during the fall of 2012. This document presents an addendum to the Coastal Wetland Vegetation Plan in order to facilitate an additional sampling and monitoring event in the fall of 2013, which would include Coastal Wetland Vegetation Plan sites in mainland herbaceous and coastal mangrove habitats, as well as all the sites established under the two aforementioned addenda.

This addendum extends the Coastal Wetland Vegetation Plan as provided for in the original plan (see Section I: Introduction and Objectives in the Coastal Wetland Vegetation Plan) for a fall 2013 sampling season. During the fall 2013 sampling event, the general survey procedures described in the Coastal Wetland Vegetation Plan will be followed (see Section V: General Survey Procedures) with similar modifications defined for the fall 2012 sampling event listed below. One noteworthy change for the fall 2013 event is the reduction of Coastal Wetland Vegetation Plan sampling sites in Louisiana to only those which occur in mainland herbaceous or coastal mangrove habitat¹.

- Light-adapted fluorescence measurements will not be taken at any site, herbaceous or mangrove.
- Chlorophyll content measurements will not be taken at any site, herbaceous or mangrove.

¹ This will reduce the total number of sites sampled in Louisiana from 164 to 128.

- Soil redox potential measurements will not be determined at any site, herbaceous or mangrove.
- Real time kinematic (RTK) elevation measurements will not be taken at any site, herbaceous or mangrove.
- As described in the addendum for the fall 2012 sampling event, the following changes will be made to lab analyses. The complete list of lab analyses planned for fall 2013 is found in Table 1.
 - Nutrient analyses will be reduced to ammonia, total phosphorous, and sulfate.
 - Sufficient material from core samples will be archived such that grain size analysis may be performed at a later date.
 - Metal analyses will not be performed on the soil samples collected for chemical characterization.

Table 1: Coastal Wetland Vegetation Fall 2013 Planned Lab Analyses

	Sample Type				
	SS Surface Soil Scoops	SCC Soil Core Chemical	SCP Soil Core Physical	B Belowground Biomass Core	C Clip Plot Vegetation
Analyses planned under the fall 2013 CWV addendum					
Hydrocarbons / PAHs	X				
Total Organic Carbon (TOC)	X				
Belowground Vegetation Biomass				X	
Aboveground Vegetation Biomass					X
Vegetation Stem Count					X
Vegetation Longest/Shortest - Stem Length					X
Vegetation Species ID					X
Vegetation Live/Dead Sort					X
Soil Organic Matter		X			
Total Solids		X			
pH/Salinity		X			
Nutrients - Ammonia, Total Phosphorus, Sulfate		X			
Soil Bulk Density			X		
True Grain Size			archive		
Nutrients - Nitrate/Nitrite	Not required for fall 2013 collection				
Metals	Not required for fall 2013 collection				

- Site sampling will be conducted in a single phase and will not include the establishment of a marsh edge stake.
- Guidance for sampling at partially eroded plots, following fall 2012 protocol, will be provided.
 - *Herbaceous sites:*
 - (1) If the 2013 productivity subplot (clip plot) is partially eroded, samplers will determine whether they can take a fully intact below ground biomass (B) core. Samplers may be able to visually inspect and will also have a plywood disk that is slightly larger in diameter than the B corer, which can be laid down as a gauge for the B core. If the B core can be taken, the plot is considered viable for sample collection (i.e., the subplot will not be moved) and all samples will be collected as

feasible. The soil scoops will be collected in the designated corners of the subplot. If a corner has eroded, soil scoop locations will not be moved to collect that scoop. Therefore, fewer than 4 soil scoops may be taken. The SCP and SCC cores will be taken outside of the plot in the areas designated in the herbaceous datasheets. If erosion prevents collection of these cores outside of the plot, the cores can be moved within the 2013 subplot. If there is limited non-eroded surface to collect both the SCC and SCP cores, the sampling priority is the SCC core.

- (2) If the 2013 productivity subplot is not viable (i.e., B core cannot be collected), sampling will be relocated to alternate productivity subplots in the following order of priority (see Figure 1 for locations):
 - a. 2020 subplot
 - b. 2015 subplot
 - c. Extra subplot

If the subplot is partially eroded, the guidance in step (1) will be used to determine if the plot is viable for collection (i.e., whether a B core can be taken). If the plot is viable, collection will proceed as in step (1), noting that the soil scoops cannot be relocated. If there is limited non-eroded surface to collect both the SCC and SCP cores, the priority is the SCC core. If none of the subplots are viable for sample collection of the B core, then samplers will evaluate all available subplots and identify the subplot with the greatest non-eroded surface area, where the SCP and SCC samples will be collected, as feasible, following guidance in step (1). Figure 2 provides the sampling decision flow chart for determining subplots at partially eroded sites.

- (3) If the B core is viable, all samples will be collected per the field sampling protocol. If there is limited non-eroded surface to collect the SCC and SCP cores, priority will be given to the SCC core.
- (4) Samplers will state which productivity subplot (e.g. 2013, 2015) is used in the notes section. Samplers will also draw an 'X' in the subplot on the station diagram on the sample collection datasheet. Samplers will draw in locations of the collected samples.

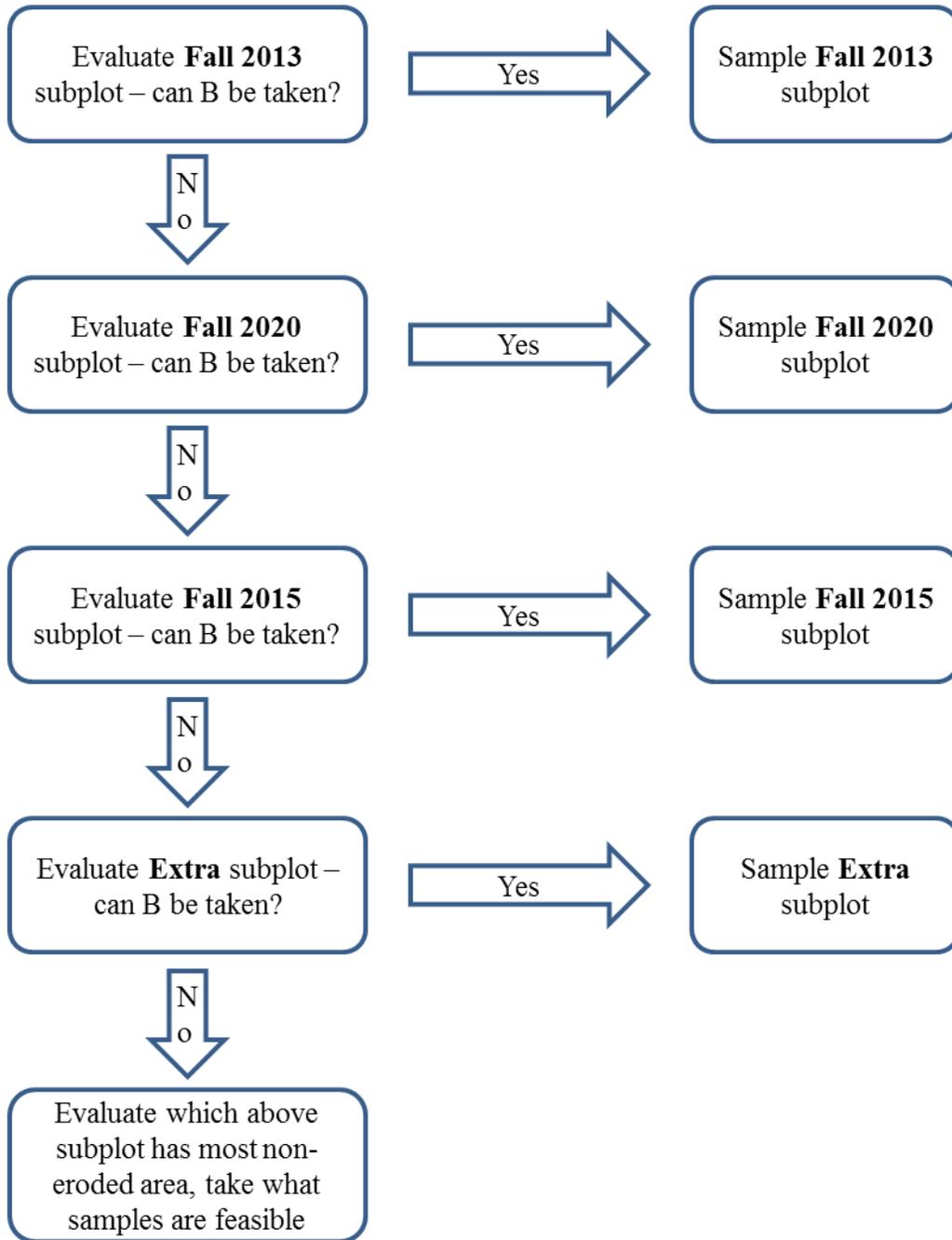
Figure 1: Productivity subplots (clip plots) and priority² for sampling eroded sites in fall 2013.

Fall 2011	#2 Fall 2020	#3 Fall 2015	Spring 2011
Fall 2010	#4 Extra Plot	#1 Fall 2013	Fall 2012

-  Current clip plot
-  Previous clip plots

² Numbers in subplots represent the priority for sampling.

Figure 2: Sampling decision flow chart for partially eroded herbaceous sites



○ *Mangrove sites:*

- (1) Samplers will first determine whether they can take a fully intact belowground biomass (B) core based on sufficient non-eroded marsh, not previously cored or exposed to heavy foot traffic, to allow for filling the core diameter. If possible, samples will be taken along the top right side (looking inland) of the mangrove-intensive plot offset away from the plot up to 0.5 m (Figure 3). If not possible, the B coring location will be relocated as follows:
 - a. If the mangrove-intensive plot is in location 1, 2, or 3 based on Figure 4, looking inland, and there is not sufficient non-eroded marsh for B coring in the preferred location as described above, the location will be moved farther to the **right** of the mangrove-intensive plot along the inland edge up to a maximum distance of 1 m from the mangrove-intensive plot. If the inland edge along the 1 m distance shows evidence of previous coring or heavy foot traffic such that a B core should not be taken, the sampling location will be moved to the inside of the 1 m x 4 m plot following the same lateral movement guidance of not exceeding the 1 m maximum distance from the intensive plot. The sampling locations will be clearly marked and labeled on the datasheets.
 - b. If the mangrove-intensive plot is in location 4 based on Figure 4, looking inland, and there is not sufficient non-eroded marsh for B coring in the preferred location as described above, the location will be moved farther to the **left** of the mangrove-intensive plot along the inland edge up to a maximum distance of 1 m from the mangrove-intensive plot. If the inland edge along the 1 m distance shows evidence of previous coring or heavy foot traffic such that a B core should not be taken, the sampling location will be moved to the inside of the 1 m x 4 m plot following the same lateral movement guidance of not exceeding the 1 m maximum distance from the intensive plot. The sampling locations will be clearly marked and labeled on the datasheets.

Figure 5 summarizes the decision making process for selecting the core sampling locations at mangrove sites.

- (2) The SCP and SCC cores will be relocated to the same area as the belowground core location. If there is not sufficient non-eroded marsh for both cores, preference will be given to the SCC core.
- (3) Soil contaminant scoops will not be relocated, but taken with the mangrove-intensive plot corners where there is non-eroded marsh. Therefore, it is possible that fewer than 4 scoops will be able to be collected.
- (4) All coring locations (whether relocated or not) will be clearly indicated on the datasheets.
- (5) All other mangrove (non-coring) data collection will proceed as stated in the Coastal Wetland Vegetation Plan for mangroves within the established plot boundaries.

Figure 3: Location of core samples relative to mangrove-intensive plot if fully intact B core can be taken

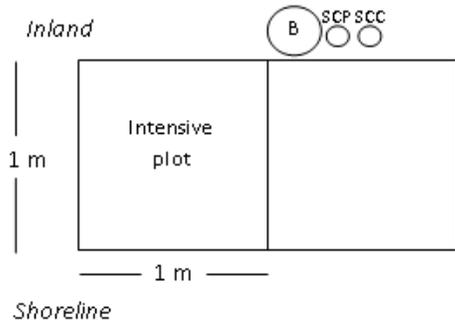


Figure 4: The four positions of the 1 m² mangrove-intensive plot.

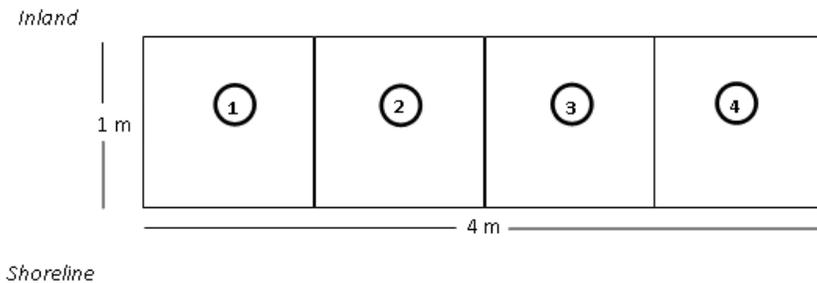
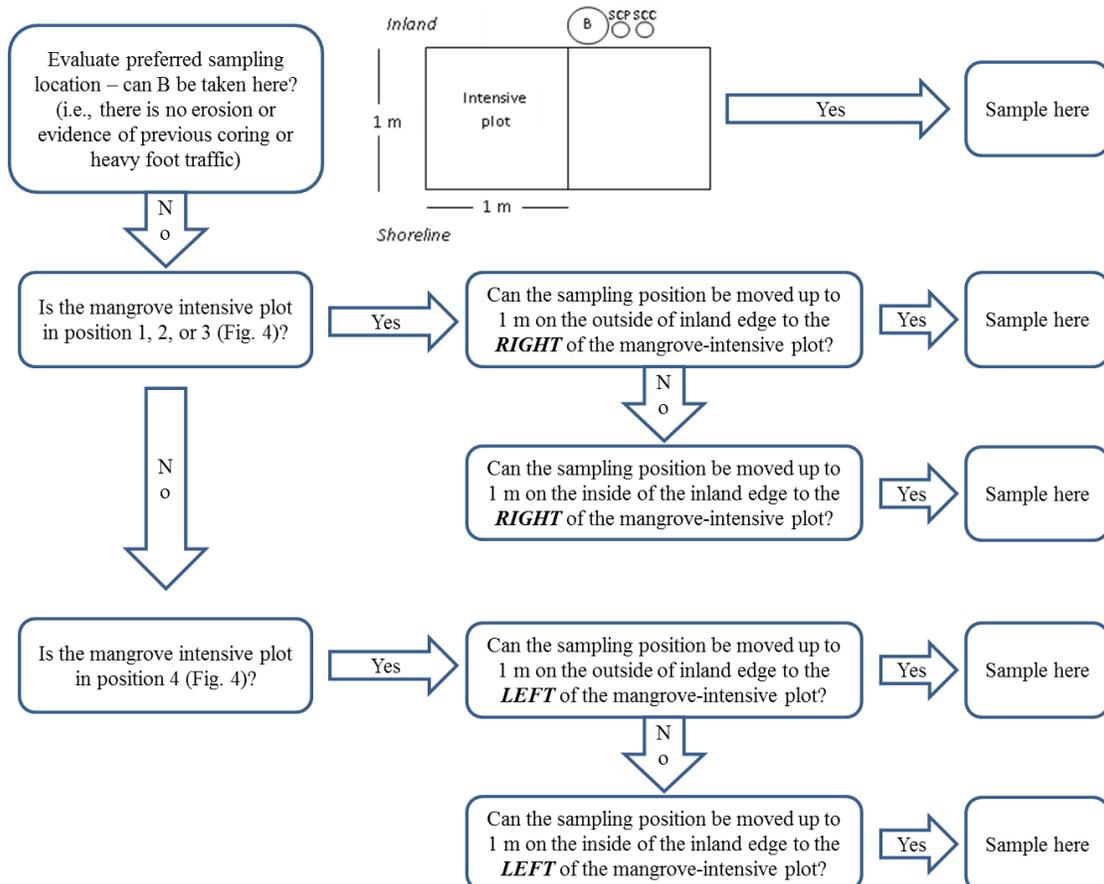


Figure 5: Sampling location decision flow chart for mangrove sites



- No sampling will occur on plots that are fully eroded. Sites where all plots are eroded (currently or previously reported as such) will be visited, erosion of all plots will be noted on the Site Set-Up / Verification datasheet, the Distance from the Inland Stake to Marsh Edge will be determined, and arrival and departure photos will be taken. Remaining fields on the Site Set-Up / Verification datasheet will be completed as possible.
- No sampling will occur on plots that were previously reported as being buried by more than 2 cm during the fall 2012 sampling event. A list of such plots will be provided to samplers. Sites where all plots have previously been reported as being buried by more than 2 cm will be revisited, the Distance from Inland Stake to Marsh Edge will be determined, and arrival and departure photos will be taken. Remaining fields on the Site Set-Up / Verification datasheet will be completed as possible.

The datasheets and quick reference guides will be updated as appropriate to reflect the changes to the sampling and monitoring procedures outlined above.

Coastal Wetland Vegetation Plan – Site Set-Up Verification Datasheet

Page ____ of ____

1	Team #: _____	Date: _____	Time (24hr): _____
2	Site ID: _____	Sampler Team Code: _____	
3	Data Recorder/Affiliation: _____		
4	Other Team Members/Affiliations: _____		

Site / Station Verification

5	Vegetation Transect Markers:		
	<i>Initial Shoreline Stake</i>	Present / Absent	If absent, do not replace.
	<i>Initial Inland Stake</i>	Present / Absent	If absent, was it replaced?
	<i>Fall 2012 Marsh Edge Stake</i>	Present / Absent	If absent, do not replace.
			Yes / No / NA
6	Station Markers:		
	Number of Stakes	Extent of Horizontal Erosion in Plot (%)	
	<i>Enter NA if the plot was never est. Otherwise, use a value 0-4 as appropriate</i>	<i>If plot fully eroded, enter 100% If plot not eroded, enter 0% If plot never established, enter NA</i>	
	Absent	Replaced	
	C1: _____	C1: _____	
	C2: _____	C2: _____	
	C3: _____	C3: _____	
	P1: _____	P1: _____	
	P2: _____	P2: _____	
	P3: _____	P3: _____	

Point Data for Vegetation Transect Shoreline Change and New Oiling Information

7	Bearing to Inland Stake: _____ ° (Obtained from Site Set-Up Datasheet)						
8	Bearing Inland Stake to Shoreline Stake: _____ ° (Add 180° to Bearing to Inland Stake if the bearing is between 0° and 180° and subtract 180° if the bearing is between 180° and 360°)						
9	Transect Length: _____ meters (Obtained from Site Set-Up Datasheet)						
10	Distance from Inland Stake to Marsh Edge: _____ meters						
11	Oil Distribution Beyond Inland Stake (circle one):	Trace (<1%)	Sporadic (1-10%)	Patchy (11-50%)	Broken (51-90%)	Continuous (91-100%)	NA
	<i>Note: If 'Trace (<1%)' or 'NA' is circled in line 11, enter NA into the three fields in line 12</i>						
12	Oil Distance from Inland Stake: _____ meters (If beyond 20 m, write >20)	Photos: _____		Waypoint: _____			

Photos

13	<i>Upon arrival:</i>						
	Offshore (1-2 m) looking inland (center of photo left of cover plots): _____						
	Offshore (1-2 m) looking inland (center of photo access point between cover and productivity plots): _____						
	Offshore (1-2 m) looking inland (center of photo right of productivity plots): _____						
14	<i>During data collection:</i>						
	At shoreline stake:						
	looking inland: _____	looking right: _____	looking left: _____				
	At inland stake:						
	looking shoreward _____	looking right: _____	looking left: _____	looking inland: _____			
15	<i>Upon departure:</i>						
	Offshore (1-2 m) looking inland (center of photo left of cover plots): _____						
	Offshore (1-2 m) looking inland (center of photo access point between cover and productivity plots): _____						
	Offshore (1-2 m) looking inland (center of photo right of productivity plots): _____						

Notes:

Sign Off:		Date	Time (24 hr)
	Responsible Party Representative/Affiliation: _____		
	State Representative/Affiliation: _____		
	Federal Representative/Affiliation: _____		

Coastal Wetland Vegetation Plan Herbaceous Marsh Cover Plot Datasheet				Page ____ of ____			
1	Team #: _____	Date: _____	Time (24 hr): _____				
2	Site ID: _____	Sampler Team Code: _____					
3	Data Recorder/Affiliation: _____						
4	Other Team Members/Affiliations: _____						
5	Habitat Type/Plot ID (circle one): C-1 / C-2 / C-3 (<i>C-1 is edge plot</i>)						
6	Water on Marsh: Yes / No If yes, record depth (if no, write NA): _____ cm (if >15cm, no further data to be collected)						
Oiling Impact Extent							
7	Vegetation Condition Index (circle one):	0	0.5	1	2	3	NA
8	Sediment Surface Oiling Coverage: _____ % if underwater, denote with UW						
9	Veg. Oiling Extent Index – On This Season’s Growth (circle one):	0	0.5	1	2	3	NA
10	Oiling Height – On This Season’s Growth (cm): _____ * (Highest point on stem from sediment surface)						
<small>*If vegetation is heavily oiled and cannot be stood up or is oiled stubble, enter HO instead of measurement; if no oiling, enter NA.</small>							
Plotwide (1 m² Plot*) Vegetation Information							
11	Total Live Cover (%): _____	16	Debris Cover (%): _____				
12	Total Dead Cover (%): _____	17	Boom Cover (%): _____				
13	Total Vegetative Cover (%): _____	18‡	Dominant Species Average Live Canopy Height (cm): _____				
14	Wrack Cover (%): _____	19‡	Vegetation Stature: _____ (ST = standing; LO = laid over)				
15	Photos: 45°: _____ 90°: _____ Waypt: _____		*All % cover measurements should be made relative to the entire 1m ² plot. ‡If appropriate (see QRG), write NA in these fields.				
Cover by Species (1 m² Plot*)							
Species Name (Scientific)	Live Cover (%)	Dead Cover (%)	Additional Information				
Circle Visibly Dominant Species (select one)							
20	Spartina alterniflora						
21	Juncus roemerianus						
22	Phragmites australis						
23	Avicennia germinans						
24	Distichlis spicata						
25	Spartina patens						
26	Salicornia sp.						
27	Batis maritima						
28	Aster sp.						
29	Borrchia frutescens						
30							
31							
32							
33							
<small>*All % cover measurements should be made relative to the entire 1m² plot.</small>							
Notes:							

Sign Off: _____ **Date** _____ **Time (24 hr)** _____

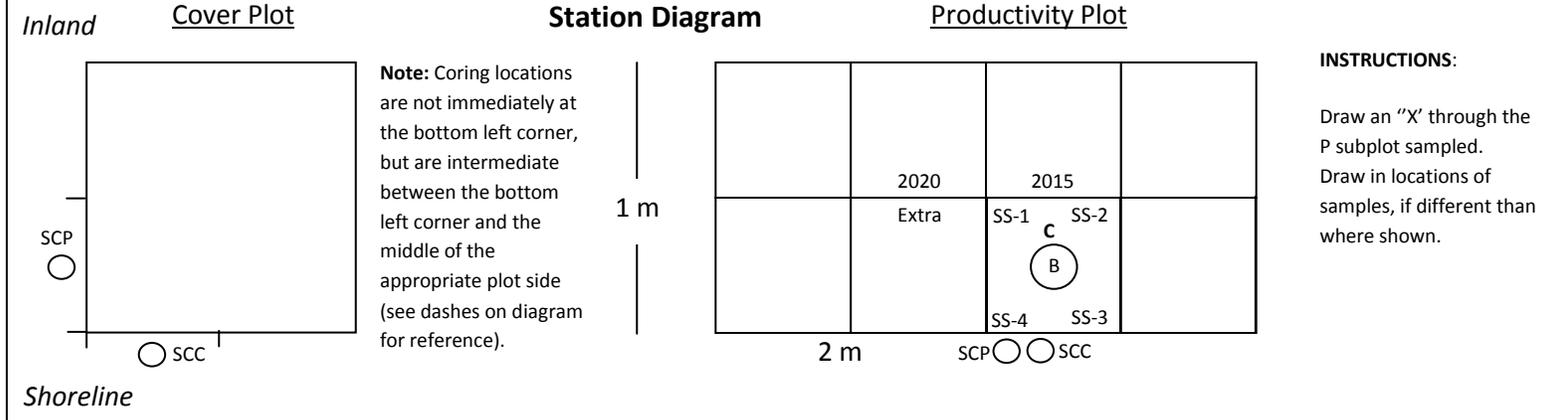
Responsible Party Representative/Affiliation: _____

State Representative/Affiliation: _____

Federal Representative/Affiliation: _____

Coastal Wetland Vegetation Plan - Herbaceous Marsh Sample Collection Datasheet Page ___ of ___

1 Team #: _____ Date: _____ Time (24 hr): _____
 2 Site ID: _____ Sampler Team Code: _____
 3 Data Recorder/Affiliation: _____
 4 Other Team Members/Affiliations: _____
 5 **Habitat Type/Zone ID (circle one):** 1 / 2 / 3 (1 is edge zone)
 6 **Water on Marsh: Yes / No** If yes, record depth: _____ cm (if >15cm, no further data to be collected)
 (If no, write NA)
 7 **Photos:** 45°: _____ 90°: _____ Waypoint: _____ Take photo of productivity plot



			Sample ID#									
	Sample Collected (circle one)	Time (24hr)	Grid Code Ex: LAAP39	YearDate Ex: D0905	Matrix	Sampler Team Code	Site ID (4 digits)	Plot Type (C or P)	Zone ID (1, 2, 3)	Sample Type (C, B, SC, or SS)	Sample Depth (cm)	Corer Type
8	Y / N			-	-	T		P		C	NA	NA
9	Y / N			-	-	L		C		SCP	10	ALC
10	Y / N			-	-	L		C		SCC	10	ALC
11	Y / N			-	-	L		P		SCP	10	ALC
12	Y / N			-	-	L		P		SCC	10	ALC
13	Y / N			-	-	T		P		B	30	STS
14	Y / N			-	-	L		P		SS-1	2	NA
15	Y / N			-	-	L		P		SS-2	2	NA
16	Y / N			-	-	L		P		SS-3	2	NA
17	Y / N			-	-	L		P		SS-4	2	NA

Sample Type Notes:
 C=clip plot (vegetation)
 B=belowground biomass core from productivity plot (collect 1 from center of designated productivity plot area+)
 SCP=soil core (collect 1 from each plot type)-physical characterization
 SCC=soil core (collect 1 from each plot type)-chemical characterization

SS=soil scoops from productivity plot (collect 4 for contaminant analysis in glass jars)
 Corer types: STS = large stainless corer; ALC = aluminum corer
 #Full sample ID (all 10 columns above) must be written on sample containers and associated forms

The Sample ID should end with the plot type letter, habitat zone number, and sample type; e.g., the label for a mid-zone cover plot soil core-physical is "...C2SCP". Note that the plot type and the sample type identifier are pre-labeled for each sample ID in the above table

18 **Photos (belowground biomass):**
Notes:

Sign Off: _____ **Date** _____ **Time (24 hr)** _____
 Responsible Party Representative/Affiliation: _____
 State Representative/Affiliation: _____
 Federal Representative/Affiliation: _____

Coastal Wetland Vegetation Plan – Site Set-Up Verification Datasheet		Page ___ of ___												
1	Team #: _____	Date: _____												
2	Site ID: _____	Time (24hr): _____												
3	Data Recorder/Affiliation: _____													
4	Other Team Members/Affiliations: _____													
Site / Station Verification														
5	Vegetation Transect Markers:													
	<i>Initial Shoreline Stake</i>	Present / Absent If absent, do not replace.												
	<i>Initial Inland Stake</i>	Present / Absent If absent, was it replaced? Yes / No / NA												
	<i>Fall 2012 Marsh Edge Stake</i>	Present / Absent If absent, do not replace.												
6	Station Markers:													
	<table border="0" style="width: 100%;"> <tr> <th colspan="2" style="text-align: center;">Number of Stakes</th> <th rowspan="2" style="text-align: center;">Extent of Horizontal Erosion in Plot (%)</th> </tr> <tr> <th style="text-align: center;">Absent</th> <th style="text-align: center;">Replaced</th> </tr> </table>	Number of Stakes		Extent of Horizontal Erosion in Plot (%)	Absent	Replaced								
Number of Stakes		Extent of Horizontal Erosion in Plot (%)												
Absent	Replaced													
	<i>If plot fully eroded, enter 100%</i> <i>If plot not eroded, enter 0%</i>													
	C1: _____	_____												
	C2: _____	_____												
	C3: _____	_____												
Point Data for Vegetation Transect Shoreline Change and New Oiling Information														
7	Bearing to Inland Stake: _____ ° (<i>Obtained from Site Set-Up Datasheet</i>)													
8	Bearing Inland Stake to Shoreline Stake: _____ ° (<i>Add 180° to Bearing to Inland Stake if the bearing is between 0° and 180° and subtract 180° if the bearing is between 180° and 360°</i>)													
9	Transect Length: _____ meters (<i>Obtained from Site Set-Up Datasheet</i>)													
10	Distance from Inland Stake to Marsh Edge: _____ meters													
11	Oil Distribution Beyond Inland Stake (circle one):	<table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">Trace</td> <td style="text-align: center;">Sporadic</td> <td style="text-align: center;">Patchy</td> <td style="text-align: center;">Broken</td> <td style="text-align: center;">Continuous</td> <td style="text-align: center;">NA</td> </tr> <tr> <td style="text-align: center;">(<1%)</td> <td style="text-align: center;">(1-10%)</td> <td style="text-align: center;">(11-50%)</td> <td style="text-align: center;">(51-90%)</td> <td style="text-align: center;">(91-100%)</td> <td></td> </tr> </table>	Trace	Sporadic	Patchy	Broken	Continuous	NA	(<1%)	(1-10%)	(11-50%)	(51-90%)	(91-100%)	
Trace	Sporadic	Patchy	Broken	Continuous	NA									
(<1%)	(1-10%)	(11-50%)	(51-90%)	(91-100%)										
	<i>Note: If 'Trace (<1%)' or 'NA' is circled in line 11, enter NA into the three fields in line 12.</i>													
12	Oil Distance from Inland Stake: _____ meters (<i>If beyond 20 m, write >20</i>)	Photos: _____ Waypoint: _____												
Photos														
13	<i>Upon arrival:</i>													
	Offshore (1-2 m) looking inland (<i>center of photo right of cover plots</i>): _____													
	Offshore (1-2 m) looking inland (<i>center of photo access point</i>): _____													
14	<i>During data collection:</i>													
	At shoreline stake:													
	looking inland: _____	looking right: _____ looking left: _____												
	At inland stake:													
	looking shoreward _____	looking right: _____ looking left: _____ looking inland: _____												
15	<i>Upon departure:</i>													
	Offshore (1-2 m) looking inland (<i>center of photo right of cover plots</i>): _____													
	Offshore (1-2 m) looking inland (<i>center of photo access point</i>): _____													
Notes: _____														

Sign Off: _____ **Date** _____ **Time (24 hr)** _____

Responsible Party Representative/Affiliation: _____

State Representative/Affiliation: _____

Federal Representative/Affiliation: _____

Coastal Wetland Vegetation Plan - Mangrove Marsh Cover Plot Datasheet							Page ___ of ___		
1	Team #: _____		Date: _____		Time (24 hr): _____				
2	Site ID: _____		Sampler Team Code: _____						
3	Data Recorder/Affiliation: _____								
4	Other Team Members/Affiliations: _____								
5	Habitat Type/Plot ID (circle one): C-1 / C-2 / C-3 (C-1 is edge plot)								
6	Water on Marsh: Yes / No If yes, record depth (if no, write NA): _____ cm (if >15cm, no further data to be collected)								
Oiling Impact Extent – 1m x 4m Plot									
7	Mangrove Vegetation Condition Index (Mangrove Adult≥50cm) (circle one):			0	0.5	1	2	3	NA
8	Mangrove Vegetation Condition Index (Mangrove Seedling<50cm) (circle one):			0	0.5	1	2	3	NA
9	Dominant Herbaceous Species Vegetation Condition Index (circle one):			0	0.5	1	2	3	NA
10	Sediment Surface Oiling Coverage: _____% if underwater, denote with UW								
11	Adult Tree Veg. Oiling Extent Index (circle one):			0	0.5	1	2	3	NA
12	Seedling (<50cm) Veg. Oiling Extent Index (circle one):			0	0.5	1	2	3	NA
Plotwide (1m x 4m Plot*) Vegetation Information									
13	Total Live Cover (%): _____		19	Boom Cover (%): _____					
14	Total Dead Cover (%): _____		20‡	Mangrove Avg Live Canopy Height (cm): _____					
15	Total Vegetative Cover (%): _____		21‡	Dominant Herbaceous Species Average Live Canopy Height (cm): _____					
16	Wrack Cover (%): _____		22‡	Herbaceous Vegetation Stature: _____ (ST=standing; LO=laid over)					
17	Debris Cover (%): _____		23‡	Maximum Live Tree Height (cm): _____					
18	Photos: 45° L ⁺ : _____ 45° R ⁺ : _____ Waypt: _____		*All % cover measurements should be made relative to the entire 1m x 4m plot.						
		+ L=take photo with back against transect; R=take photo facing transect		‡If appropriate (see QRG), write NA in these fields.					
Cover by Species (1m x 4m Plot*)									
Species Name (Scientific)		Live Cover (%)	Dead Cover (%)	Additional Information					
<i>Circle Visibly Dominant HERBACEOUS (not Avicennia) Species (select one)</i>									
24	Avicennia germinans								
25	Spartina alterniflora								
26	Juncus roemerianus								
27	Distichlis spicata								
28	Spartina patens								
29	Salicornia sp.								
30	Blutaparon vermiculare								
31	Batis maritima								
32	Aster sp.								
33	Borrichia frutescens								
34									
35									
36									
37									
*All % cover measurements should be made relative to the entire 1m x 4m plot.									

Notes:

Sign Off:

Date **Time (24 hr)**

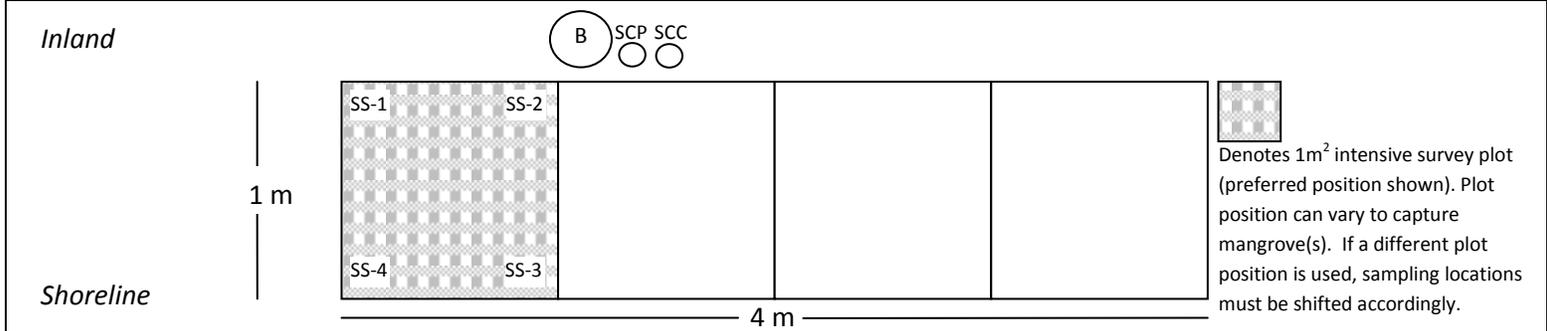
Responsible Party Representative/Affiliation: _____

State Representative/Affiliation: _____

Federal Representative/Affiliation: _____

Coastal Wetland Vegetation Plan		Page ___ of ___
1	Team #: _____ Date: _____ Time (24 hr): _____	
2	Site ID: _____ Sampler Team Code: _____	
3	Data Recorder/Affiliation: _____	
4	Other Team Members/Affiliations: _____	
5	Habitat Type/Plot ID (circle one): C-1 / C-2 / C-3 (C-1 is edge plot)	

Station Diagram



	Sample Collected (circle one)	Time (24hr)	Sample ID#										
			Grid Code Ex: LAAP39	YearDate Ex: D0905	Matrix	Sampler Team Code	Site ID (4 digits)	Plot Type (C or P)	Zone ID (1, 2, 3)	Sample Type (C, B, SC, or SS)	Sample Depth (cm)	Corer Type	
6	Y / N			-	-	T			C		B	30	STS
7	Y / N			-	-	L			C		SCP	10	ALC
8	Y / N			-	-	L			C		SCC	10	ALC
9	Y / N			-	-	L			C		SS-1	2	NA
10	Y / N			-	-	L			C		SS-2	2	NA
11	Y / N			-	-	L			C		SS-3	2	NA
12	Y / N			-	-	L			C		SS-4	2	NA

Sample Type Notes:
 B=belowground biomass core from plot (collect 1 from outside plot, as shown above)
 SCP=soil core (collect 1 from outside plot as shown above)-physical characterization
 SCC=soil core (collect 1 from outside each plot as shown above)-chemical characterization
 SS=soil scoops from plot (collect 4 for contaminant analysis)

Corer types: STS = large stainless corer for belowground biomass;
 ALC = aluminum corer
 The Sample ID should end with the plot type letter, habitat zone number, and sample type; e.g., the label for a mid-zone plot soil core-physical is "...C2SCP". Note that the plot type and the sample type identifier are pre-labeled for each sample ID in the above table
 #Full sample ID (all 10 columns above) must be written on sample containers and associated forms

13 **Photos (belowground biomass):** _____ **Waypoint:** _____

Notes:

Sign Off: _____ **Date** _____ **Time (24 hr)** _____

Responsible Party Representative/Affiliation: _____

State Representative/Affiliation: _____

Federal Representative/Affiliation: _____

Coastal Wetland Vegetation Plan Data/Sample Collection Quick Reference Guidance – Herbaceous Marsh
Plan ID: Assessment of MC252 Oil Impacts to Coastal Wetland Vegetation

General Coastal Vegetation Assessment Guidance

1. **Planning and Logistics**

The day's sites, launch times, and intake locations will be posted on the NRDA Field Ops Marsh Team Tracking Whiteboard.

2. **NRDA Field Operations Safety Information**

At the beginning of the day, be sure to check in with NRDA Field Ops on the 700 mhz radio or by cell phone notifying ICP when on water. Turn spot tracker on by depressing the on button (top button) until it blinks green. Then depress and hold the "bootprint" button until it blinks green. When done properly, the GPS light will blink green intermittently and the "sent" light will begin blinking green momentarily.

ONLY USE LITHIUM BATTERIES IN SPOT TRACKERS. Be sure to notify NRDA Field Ops of any changes to the personnel onboard prior to departing dock. Call in to NRDA Field Ops for a mid-day check and when off water. This is your float plan; any deviations from this instruction will result in a USCG violation and breach of standard safety protocol for the entire project. Please complete a "Daily Safety Vessel Checklist" for each boat. If any of the listed safety items are not present or if the registration number provided by Field Ops does not match the registration number on the vessel, please call NRDA Field Ops (504-303-2086) prior to the commencement of operations. Take a photograph of the registration number on the side of the boat.

3. **GPS Logs**

All field teams should have at least one Garmin Map 76 or Map 60 assigned. Before leaving the dock, turn on your GPS. Once satellite signal has been acquired, take a picture of your location screen with time (collect two photos if not on same screen). Clear unit of all previous way points or tracks, then turn on track log. Your GPS will be given to data intake for download of your daily activity. *Note: GPS operation is a Trustee function.*

4. **Data Intake**

Data intake personnel will download files from all electronic equipment (GPSs and camera) along with the scanning of the original datasheets produced in the field. **All information and samples will be relinquished to the sample intake crews under proper chain-of-custody documentation.** Following data upload, the data intake team will supply each member of the team with an electronic copy of the transfer to be placed on a USB thumb drive. If no data are collected by a sample team, no approach photos need be taken and no datasheet filled out unless site is not sampled due to erosion. Information about why the site was unable to be sampled should be included in the team's daily summary to Field Ops. Data intake personnel will provide guidance as to laboratory destination and specific analyses to be performed.

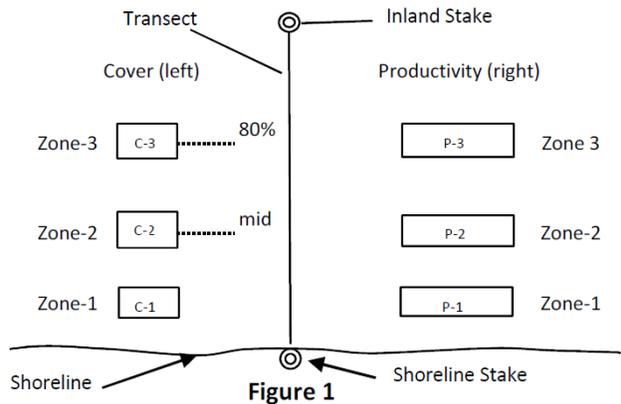
Site Set-up Verification Datasheet (Fall 2013 – v1)

Note: Upon reaching a transect, the “Coastal Wetland Vegetation Plan – Site Set-Up Verification” datasheet should be completed first. Previously completed “Site Visit/Set-Up” datasheets are provided in a booklet to each team for reference.

1. **Team #:** Assigned by NRDA Field Operations for the purpose of radio communications and field assignments. The format should be state abbreviation-team #. Example: LA-1
Date: mm/dd/yy
Time (24hr): Actual time site set-up was verified. Time should be recorded in 24hr notation – example: 1:00 pm should be recorded as 13:00. Louisiana observes daylight savings time. Please be aware of the time of year and time changes.
 2. **Site ID:** Actual site number to be referenced on all datasheets and samples. Assigned by NRDA Field Ops. Clean-up sites have a dash (ex. B-01).
Sampler Team Code: Alphanumeric-provided by NOAA for analytical sample identification.
 3. **Data Recorder/Affiliation:** Trustee (state or federal representative) responsible for entering data on data sheet for that site. Enter name and affiliation following the format First Last (Primary Affiliation/Secondary Affiliation). Ex: Jane Doe (Shaw/CPRA/LA), John Doe (AIS/NOAA), Jim Doe (Cardno ENTRIX/BP)
 4. **Other Team Members:** Include additional parties involved with data collection for that site. Enter name and affiliation - see #3 for format.
 5. **Vegetation Transect Markers:** Note the presence or absence of the initial shoreline, initial inland, and Fall 2012 marsh edge stake. If the Inland stake is present, indicate NA for its replacement. If either the initial shoreline stake or Fall 2012 marsh edge stake is missing, it will not be replaced. If the Inland stake is missing and the team has a Trimble unit, replace the stake. If for any reason the Inland stake cannot be replaced, note this in the log book.
 6. **Station Markers:**
 For any plot, if 1 or 2 PVC poles that mark the plot are missing, then replacement PVC poles should be employed to re-mark plots fully.
 For any plot, if 3 PVC poles that mark the plot are missing, then replacement PVC poles should be carefully employed to re-mark plots fully according to the following constraints. Plots must be carefully re-established in such a fashion that they do not include former areas of destructive sampling, such as soil core collection or walk paths outside of the plot. Consult the “Site Visit/Set Up Datasheet” to verify distances as appropriate.
 If all the PVC poles marking a plot are missing, then see below.
 - a. If PVC poles are missing due to erosion then this plot cannot be re-established.
 - b. If PVC poles are missing due to factors other than erosion (e.g., vandalism) and there is clear evidence of the location of the plot (e.g., markings from PVC poles or previously collected cores), then the plot should be re-established in the same location.
 - c. If PVC poles are missing due to factors other than erosion (e.g., vandalism) and there is not clear evidence of the location of plot, then the plot should be revisited with a Trimble GPS and reestablished using coordinates provided by NRDA Field Ops, previous Site Set-Up datasheets, and the GPS as a guide.
 If a plot is submerged or partially submerged, it should be sampled to the extent feasible and should not be re-established at a different location. Any signs of erosion should be noted on the datasheets and in the field notebook. If the water depth exceeds 15 cm, the site should not be sampled. Rather, the water depth should be recorded in the logbook, no datasheets should be filled out, and the site should be revisited when the water level is lower.
 If the plot was never established, write ‘NA’ for the number of absent and replaced stakes as well as for the extent of erosion in the plot. If the plot was established, indicate the number of stakes absent and replaced. Also note the extent of *horizontal* erosion in the plot.
 7. **Bearing to Inland Stake:** Record this value from the Site Set-Up datasheet.
 8. **Bearing Inland Stake to Shoreline Stake:** Calculate this value by adding 180° to line 6 if the bearing is between 0° and 180° or subtracting 180° from line 6 if the bearing is between 180° and 360°.
 9. **Transect Length:** Record this value from the Site Set-Up datasheet.
 10. **Distance from Inland Stake to Marsh Edge:** Distance should be recorded in meters.
 11. **Oil Distribution:** Circle the appropriate oil distribution based on the surface area coverage of the oil. If no oil was observed beyond the inland stake, circle NA. Consider an area approximately 10m on either side of the transect to the farthest inland point of observed oil or 20 m inland of the inland stake, whichever is closest to the inland stake.
 12. *Note: if no oil or trace oil (<1%) was observed beyond the inland stake, write NA for the following fields.*
Distance from Inland Stake: Record the distance parallel to the transect of the inland stake to the farthest inland point of observed oil. This measurement should be made along the transect. If farthest inland point of observed oil is beyond 20 m inland of the inland stake, write '>20'.
Photos: Take at least 2 photographs of the observed oiling and record the photograph numbers.
Waypoint: Take a waypoint at the farthest inland point of observed oil.
- Note: directions for all photographs are from the photographer’s perspective.
13. **Photos: Upon Arrival:** Note the photo number(s) for each of the three types of photos to be taken upon arrival.
 14. **Photos: During Data Collection:** Note the photo numbers(s) for each of the seven types of photos to be taken during data collection.
 15. **Photos: Upon Departure:** Note the photo numbers(s) for each of the three types of photos to be taken upon departure.

Herbaceous Marsh Cover Plot Datasheet (Fall 2013 – v1)

- Team Number:** Assigned by NRDA Field Operations for the purpose of radio communications and field assignments. The format should be state abbreviation-team #. Example: LA-1
Date: mm/dd/yy
Time (24hr): Actual time plot sampled; time should not be the same for all plots at the site. Time should be recorded in 24hr notation – example: 1:00 pm should be recorded as 13:00. Louisiana observes daylight savings time. Please be aware of the time of year and time changes.
- Site ID:** Actual site number to be referenced on all datasheets and samples. Assigned by NRDA Field Ops. Clean-up sites have a dash (ex. B-01).
Sampler Team Code: Alphanumeric-provided by NOAA for analytical sample identification.
- Data Recorder:** Trustee (state or federal representative) responsible for entering data on data sheet for that site. Enter name and affiliation following the format First Last (Primary Affiliation/Secondary Affiliation). Ex: Jane Doe (Shaw/CPRA/LA), John Doe (AIS/NOAA), Jim Doe (Cardno ENTRIX/BP)
- Other Team Members:** Include additional parties involved with data collection for that site. Enter name and affiliation - see #3 for format.
- Habitat Type/Plot ID:** Consult Figure 1 and select the corresponding plot ID for habitat type. There will be one cover plot data sheet per cover plot.



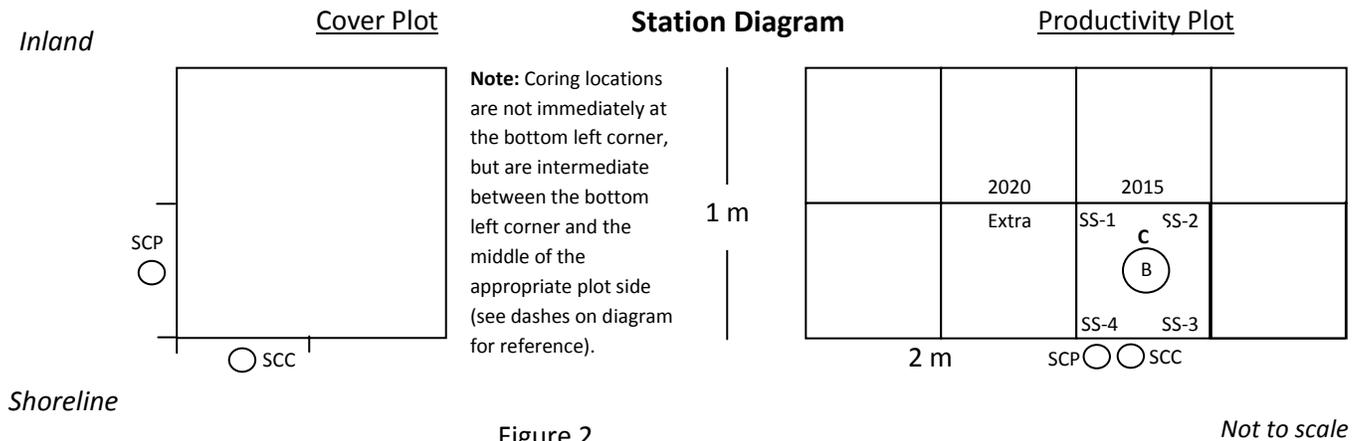
Note: for transects less than 7 meters in length, only two plots may be established (C-1/P-1 and C-2/P-2).

Figure 1

- Water on Marsh:** Record water depth in centimeters-should be measured in the plot and represent an average water depth for the entire plot. If no water is on marsh, write NA for depth. *Note: No data can be collected if greater than 15 cm.*
- Vegetation Condition Index:**
 NA = No vegetation in plot.
 0 = Vegetation having a natural appearance, stem/leaf chlorosis not exceeding a slight mottling or occasional yellowing as observed in reference plots.
 0.5 = Vegetation having an intense speckled chlorosis.
 1.0 = Vegetation green but with considerable chlorosis (<50% chlorosis).
 2.0 = Vegetation having >50% yellowing (chlorosis) of leaves and stems.
 3.0 = Vegetation dead; no green aboveground tissue visible.
Note: Vegetation Condition Index should be determined on live tissue only, unless all vegetation is dead (Vegetation Condition Index = 3.0).
- Sediment Surface Oiling Coverage:** estimate of percentage of visible oiled sediment observed.
- Vegetation Oiling Extent Index-On This Season's Growth:** To be performed on this season's growth vegetation
 NA = No vegetation in plot.
 0 = No oil evident anywhere in the plot.
 0.5 = Oil intermittently present on plant stems.
 1.0 = Oil present on 5%-25% of plant stems.
 2.0 = Oil present >25%-50% of plant stems.
 3.0 = Oil present on > 50% of plant stems.
Note: Oiling Index should be determined by the presence/absence of oil observed on a percentage of stems within the plot, not by oiling degree
- Oiling Height-On This Season's Growth:** Highest point of observed oil on the stem of this year's growth. Recorded in cm. For laid over vegetation, if vegetation can be stood up, oiling height should be measured from base of stem to the highest point observed on stem. If vegetation is heavily oiled and cannot be stood up or is oiled stubble, enter HO (heavily oiled) instead of measurement. If there is new growth but no oiling, enter '0.' If there is no new growth, circle 'NA.'
- Total Live Cover:** Estimate of percentage of LIVE vegetation cover observed within the plot.
- Total Dead Cover:** Estimate of percentage of DEAD vegetation cover (brown leaf matter) observed within the plot.
- Total Vegetative Cover:** Estimate of percentage of ALL vegetative cover observed within the plot - should be the sum of lines 11 & 12
- Wrack Cover:** estimate of percentage of vegetative wrack cover within the plot.
- Photos:** 45°: collect from transect looking toward the plot; 90°: collect looking downward above plot. Photos should be obtained prior to disturbing plot area. A white board should also be employed with the following information: Site ID, Plot ID, and Date. White board should always be placed in lower left hand corner of plot for consistency. *Note: Photos should be obtained utilizing a camera with a minimum of 10 mp resolution.*
- Waypt** Record GPS waypoint at each plot.
- Debris Cover:** Estimate of percentage of debris cover within the plot - boards, trash, etc.
- Boom Cover:** Estimate of percentage of boom cover within the plot if present.
- Dominant Species Avg. Live Canopy Height:** Average LIVE CANOPY height of DOMINANT species in centimeters. Note: not total height measurement; does not include inflorescence. Record the height only in this field; note the dominant species in the appropriate field in the *Cover by Species* section (see line 20 below). If there is no live cover, write 'NA.'
- Vegetation Stature:** ST=standing, LO=laid over. If there is 0% vegetative cover, write 'NA.'
- Cover by Species:** Identify each species with an estimation of percentage of live and dead cover relative to the entire plot. Note: acceptable to be >100% due to overlapping species within canopy. This percentage should be absolute cover and may also be greater than total cover -Ex: total live cover = 60%, species A = 50%, species B = 15%. Note the dominant species based on live vegetation by circling the appropriate species name in the left-hand column. This species should be the one used for obtaining the metric in line 18 (dominant species average live canopy height). Use blank rows to add species additional to those preprinted. If a species is not present, enter a "0" for the "Live Cover" and "Dead Cover" metrics.

Herbaceous Marsh Sample Collection Datasheet (Fall 2013 – v1)

1. **Team Number:** Assigned by NRDA Field Operations for the purpose of radio communications and field assignments. The format should be state abbreviation-team #: Example: LA-1
Date: mm/dd/yy
Time (24hr): Actual time plot sampled; time should not be the same for all plots at the site. Time should be recorded in 24hr notation – example: 1:00 pm should be recorded as 13:00. Louisiana observes daylight savings time. Please be aware of the time of year and time changes.
2. **Site ID:** Actual site number to be referenced on all datasheets and samples. Assigned by NRDA Field Ops. Clean-up sites have a dash (ex. B-01).
Sampler Team Code: Alphanumeric-provided by NOAA for analytical sample identification.
3. **Data Recorder:** Trustee (state or federal representative) responsible for entering data on data sheet for that site. Enter name and affiliation following the format First Last (Primary Affiliation/Secondary Affiliation) Ex: Jane Doe (Shaw/CPRA/LA), John Doe (AIS/NOAA), Jim Doe (Cardno ENTRIX/BP)
4. **Other Team Members:** Include additional parties involved with data collection for that site. Enter name and affiliations-see #3 for format.
5. **Habitat Type/Zone ID:** Consult Figure 1 and select the corresponding zone ID for habitat type. There will be one sample collection datasheet per zone.
6. **Water on Marsh:** Record water depth in centimeters-should be measured in the plot and represent an average water depth for the entire plot. If no water is on marsh, write NA for depth. *Note: No data can be collected if greater than 15 cm.*
7. **Photos:** Take photos of productivity plot. For general instructions, see line 15 under Herbaceous Marsh Cover Plot Datasheet (page 3 of 8).
Station Diagram: If there is no erosion noted in the Productivity Plot, place an 'X' in the subplot on the bottom row and third from the left to indicate that samples were taken as illustrated on the diagram. If partial erosion of the Productivity Plot has occurred, follow the guidance and flow chart on pages 5-6.
- 8- **Sample Collected:** Indicate whether or not the sample was collected.
17. **Time:** Enter the time at which the sample was collected. Time should be entered in 24hr format with a colon. Example 1 pm should be 13:00.
Grid Code: NRDA sample grid. Grid code may be entered once for all samples collected.
YearDate: Year letter (A=2010, B=2011, C=2012, D=2013) and mddd. YearDate may be entered once for all samples collected.
Matrix: Matrix letter (Tissue=T and Soil=L). This field is prelisted for all samples.
Sampler Team Code: Alphanumeric-provided by NOAA for analytical sample identification. This code may be entered once for all samples.
Site ID: Site number to be referenced for samples. This ID may be entered once for all samples and should be entered as a 4 digit number (add leading zeros if needed).
Plot Type: Productivity or cover plot. This field is prelisted for all samples.
Zone ID: Zone location (from line 5). This ID may be entered once for all samples.
Sample Type: Each sample type is prelisted on the sample collection table and explained in the notes below the table. The sample types are also depicted on the data sheet figures (and Figure 2 below) for both the cover plot and productivity plot along with their collection location in reference to the paired plots and transect.
Sample Depth: The proper sample collection depth is prelisted in each cell for the corresponding sample type. Please ensure that the samples have been collected from the appropriate depths as indicated by measuring the recovery from each sample collection location or core.
Core Type: The type of corer used in obtaining the sample. This field is prelisted for all samples.
Summary Notes: for Fall 2013, the following samples should be collected utilizing the specified devices or methods as indicated on datasheet diagrams:
C = Clip-clip aboveground material from designated subplot using 0.5 x 0.5 m PVC frame and double bag sample
B = Belowground Biomass-16 cm stainless steel sampler-30 cm depth. Extrude sample into Ziploc or plastic storage bag.
SCP= Soil Core-Physical Characterization-7.2 cm aluminum sample tube-10 cm depth (collect from each plot type as indicated). Extrude sample into Ziploc storage bag.
SCC = Soil Core-Chemical Characterization-7.2 cm aluminum sample tube-10 cm depth (collect from each plot type as indicated). Extrude sample into Ziploc storage bag.
SS = Soil Scoops (collected as indicated on datasheet diagram utilizing a gloved hand-2 cm depth). Place into glass jars.
18. **Photos:** Collect one photo of each below ground biomass sample recovery. A white board should also be depicted in the photo with the following information: Site ID, Date, & Plot ID.



Herbaceous Guidance: Sampling in Eroded and Previously Buried Plots (Fall 2013 – v1)

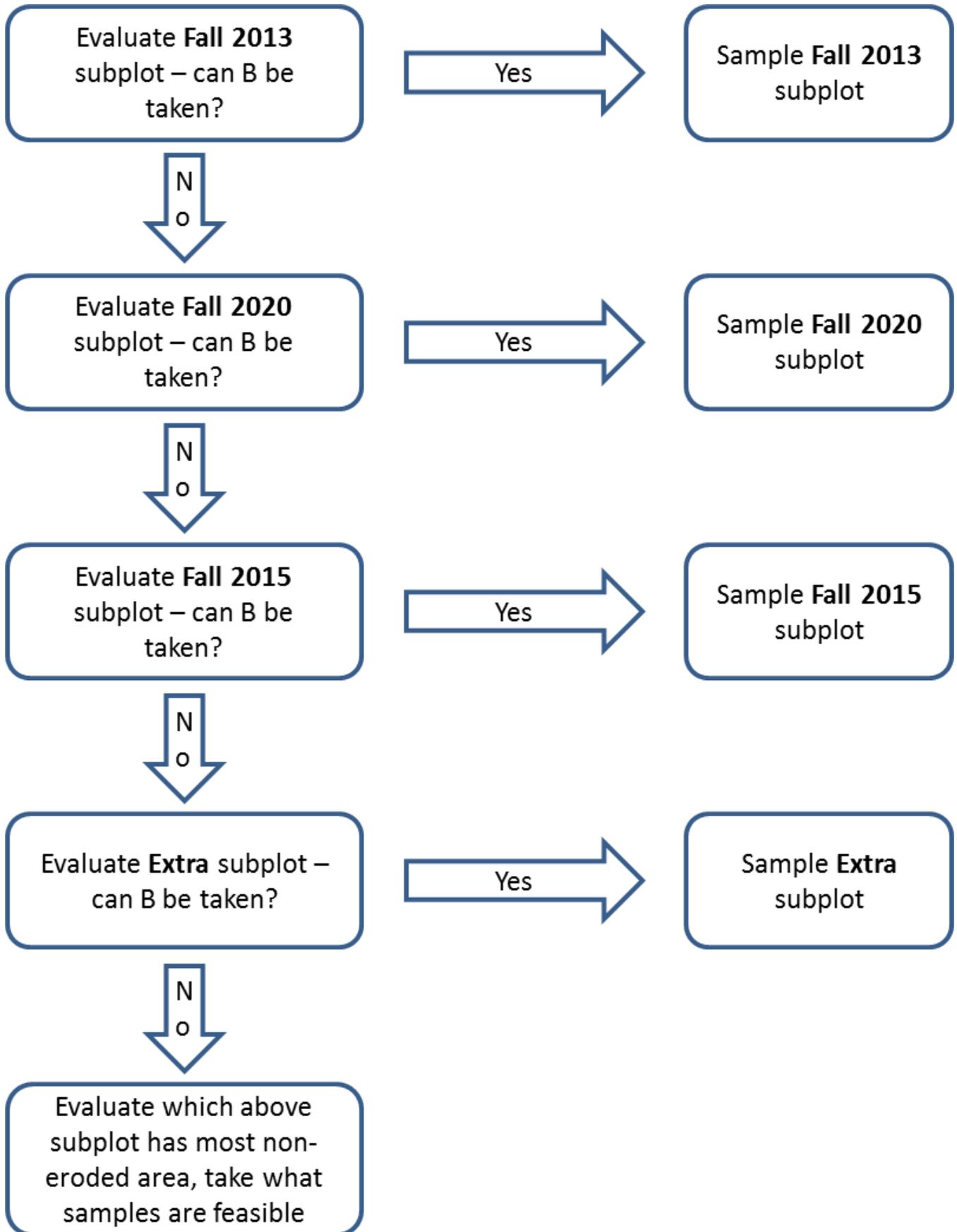
1. No sampling should occur on plots that are fully eroded.
2. If all plots at the site are fully eroded, the erosion of all plots should be confirmed by completing the Site Set-Up Verification Sheet, noting full erosion for each plot and the Distance from the Inland Stake to Marsh Edge, and completing arrival and departure photos. The remaining information on the Site Set-Up Verification Sheet should be completed as possible. Any existing PVC stakes delineating the site, transect path, and plots should not be removed from the site.
3. If the 2013 productivity subplot is partially eroded, samplers should determine whether they can take a fully intact below ground biomass (BGB) core. Samplers may be able to visually inspect. In addition, samplers have a plywood disk that is slightly larger in diameter than the BGB corer. That disk can be laid down as a gauge for the BGB core. If the BGB core can be taken, all samples should be collected as feasible. The soil scoops should be collected in the designated corners of the subplot. If a corner has eroded, do not move the soil scoop location to collect that scoop. Therefore, fewer than 4 soil scoops may be taken. The SCP and SCC cores should be taken in the designated areas, but can be moved within the designated limits of the 2013 subplot if those locations have eroded.
4. If the 2013 productivity subplot is not viable (BGB core cannot be collected), the subplot should be relocated to the productivity subplot designated for 2020 (center left subplot on the inland row). If the 2020 subplot is partially eroded, use the guidance in #1 to determine whether a BGB core can be taken, as well as other samples. Samplers should note the new location in the notes section. If the BGB core is viable, collect all samples per the field sampling protocol. The SCC and SCP cores should be taken outside of the subplot along the inland edge of the 2020 subplot. If there is limited non eroded surface to collect the SCC and SCP cores, priority should be given to the SCC core.
5. If the 2020 productivity subplot is not viable (BGB core cannot be collected), there are 2 additional subplots available for sampling: the 2015 subplot and the 'extra' subplot not designated for a particular year. Samplers should evaluate the 2015 subplot per guidance in #3 and collect samples, if feasible. If this plot is not viable, samplers should evaluate the 'extra' subplot per guidance in #3 and collect samples, if feasible. If this subplot is not viable, samplers then evaluate the 2013 subplot per guidance in #1 and collect samples, if feasible. If the BGB core cannot be collected in the 2013 subplot, samplers should evaluate the available subplots (2013, 2020, 2015, 'extra') and identify the subplot with the greatest non eroded surface area. Samples (other than the BGB core) should be collected from this subplot. The guidance in #3 provides clarification on collection of samples aside from the BGB core in partially eroded subplots.
6. Samplers should state which productivity subplot (e.g. 2013, 2015) is used in the notes section. Samplers should also draw an 'X' in the subplot on the station diagram on the sample collection datasheet and draw in locations of the collected samples.

Productivity Plot

Fall 2011	#2 Fall 2020	#3 Fall 2015	Spring 2011
Fall 2010	#4 Extra Plot	#1 Fall 2013	Fall 2012

- Current clip plot
- Previous clip plots

7. No sampling should occur on plots that have been previously reported to be buried by more than 2 cm. A list of these plots is provided. If all plots at the site have been previously reported as being buried by more than 2 cm, the Site Set-Up / Verification datasheet should be completed noting the Distance from the Inland Stake to Marsh Edge, and the arrival and departure photos should be taken. The remaining information on the Site Set-Up / Verification datasheet should be completed as possible.
8. If the plot has been reported as previously experiencing burial up to 2 cm, it should be sampled as normal.



Equipment Checklist

- | | | | |
|--------------------------|--|--------------------------|---|
| <input type="checkbox"/> | Clipboard | <input type="checkbox"/> | White board |
| <input type="checkbox"/> | Write-in-the-rain Pens | <input type="checkbox"/> | Dry erase markers |
| <input type="checkbox"/> | 50 m measuring tape | <input type="checkbox"/> | Datasheets |
| <input type="checkbox"/> | Small metric tape measure or level rod | <input type="checkbox"/> | Waterproof labels |
| <input type="checkbox"/> | Compass | <input type="checkbox"/> | Map book with GPS coordinates and sample grid ID |
| <input type="checkbox"/> | Book with site set-up sheets | <input type="checkbox"/> | Tyvek suits and other safety gear |
| <input type="checkbox"/> | PVC -10' long, 1¼" wide (at least 3 per site) | <input type="checkbox"/> | Nitrile gloves |
| <input type="checkbox"/> | PVC -10' long, ¾" wide (12 per site) | <input type="checkbox"/> | Stainless steel below-ground biomass sampler with extruder, cap, and clamps |
| <input type="checkbox"/> | Pole driver | <input type="checkbox"/> | Shovel |
| <input type="checkbox"/> | Flagging tape (arctic grade) | <input type="checkbox"/> | Trowel |
| <input type="checkbox"/> | Hand saw | <input type="checkbox"/> | 8 oz. wide mouth sample jars |
| <input type="checkbox"/> | Multi tool | <input type="checkbox"/> | 1 and 2 gal. Ziploc bags, black contractor, and white kitchen garbage bags |
| <input type="checkbox"/> | Sharpies | <input type="checkbox"/> | 7.2 cm aluminum corer with cap, extruder, and metal file |
| <input type="checkbox"/> | 1 m quadrats (3) | <input type="checkbox"/> | Single hand clippers |
| <input type="checkbox"/> | ½ x ½ m quadrat | <input type="checkbox"/> | Coolers |
| <input type="checkbox"/> | Boot covers (1 pair per person per site) | <input type="checkbox"/> | Heavy duty paper towels and decontamination supplies |
| <input type="checkbox"/> | Trash bags or drum liners | <input type="checkbox"/> | D1 water (laboratory grade) |
| <input type="checkbox"/> | Quick Reference Guide | <input type="checkbox"/> | Alconox |
| <input type="checkbox"/> | Trimble Geo XH | <input type="checkbox"/> | 2 spray bottles |
| <input type="checkbox"/> | Camera | <input type="checkbox"/> | 5 gallon bucket |
| <input type="checkbox"/> | Spot tracker | <input type="checkbox"/> | Compass |
| <input type="checkbox"/> | 700 MHz radio | <input type="checkbox"/> | Scissors |
| <input type="checkbox"/> | 700 MHz radio charger | <input type="checkbox"/> | Tape – clear and duct |
| <input type="checkbox"/> | VHF radio | <input type="checkbox"/> | Stadia Rod |
| <input type="checkbox"/> | VHF radio charger | <input type="checkbox"/> | Stainless steel meter stick |
| <input type="checkbox"/> | Personal flotation device | <input type="checkbox"/> | Work/Kevlar gloves |
| <input type="checkbox"/> | Extra batteries (AA, AAA lithium, and other types as needed) | <input type="checkbox"/> | Enclosed eye goggles |
| <input type="checkbox"/> | Wooden stakes (for Refuge property) | <input type="checkbox"/> | Hip/chest waders |
| <input type="checkbox"/> | Permits and safety forms | <input type="checkbox"/> | Toothbrush |
| <input type="checkbox"/> | Vessel safety checklists | | |

Coastal Wetland Vegetation Plan Data/Sample Collection Quick Reference Guidance – Mangrove
Plan ID: Assessment of MC252 Oil Impacts to Coastal Wetland Vegetation

General Coastal Vegetation Assessment Guidance

1. **Planning and Logistics**

The day's sites, launch times, and intake locations will be posted on the NRDA Field Ops Marsh Team Tracking Whiteboard.

2. **NRDA Field Operations Safety Information**

At beginning of day, be sure to check in with NRDA Field Ops on the 700 mhz radio or by cell phone notifying ICP when on water. Turn spot tracker on by depressing the on button (top button) until it blinks green. Then depress and hold the "bootprint" button until it blinks green. When done properly, the GPS light will blink green intermittently and the "sent" light will begin blinking green momentarily. **ONLY USE LITHIUM BATTERIES IN SPOT TRACKERS.** Be sure to notify NRDA Field Ops of any changes to the personnel onboard prior to departing dock. Call in to NRDA Field Ops for a mid-day check and when off water. This is your float plan; any deviations from this instruction will result in a USCG violation and breach of standard safety protocol for the entire project. Please complete a "Daily Safety Vessel Checklist" for each boat. If any of the listed safety items are not present or if the registration number provided by Field Ops does not match the registration number on the vessel, please call NRDA Field Ops (504-303-2086) prior to the commencement of operations. Take a photograph of the registration number on the side of the boat.

3. **GPS Logs**

All field teams should have at least one Garmin Map 76 or Map 60 assigned. Before leaving the dock, turn on your GPS. Once satellite signal has been acquired, take a picture of your location screen with time (collect two photos if not on same screen). Clear unit of all previous way points or tracks, then turn on track log. Your GPS will be given to data intake for download of your daily activity. *Note: GPS operation is a Trustee function.*

4. **Data Intake**

Data intake personnel will download files from all electronic equipment (GPSs and camera) along with the scanning of the original datasheets produced in the field. **All information and samples will be relinquished to the sample intake crews under proper chain-of-custody documentation.** Following data upload, the data intake team will supply each member of the team with an electronic copy of the transfer to be placed on a USB thumb drive. If no data are collected by a sample team, no approach photos need be taken and no datasheet filled out unless site is not sampled due to erosion. Information about why the site was unable to be sampled should be included in the team's daily summary to Field Ops. Data intake personnel will provide guidance as to laboratory destination and specific analyses to be performed.

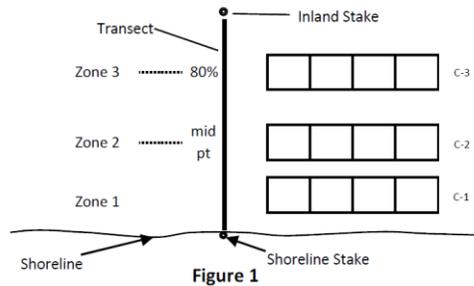
Site Set-Up Verification Datasheet (Fall 2013 – v1)

Note: Upon reaching a transect, the “Coastal Wetland Vegetation Plan – Site Set-Up Verification” datasheet should be completed first. Previously completed “Site Visit/Set-Up” datasheets are provided in a booklet to each team for reference.

1. **Team #:** Assigned by NRDA Field Operations for the purpose of radio communications and field assignments. The format should be state abbreviation-team #. Example: LA-1
Date: mm/dd/yy
Time (24hr): Actual time site set-up was verified. Time should be recorded in 24hr notation – example: 1:00 pm should be recorded as 13:00. Louisiana observes daylight savings time. Please be aware of the time of year and time changes.
2. **Site ID:** Actual site number to be referenced on all datasheets and samples. Assigned by NRDA Field Ops. Clean-up sites have a dash (ex. B-01).
Sampler Team Code: Alphanumeric-provided by NOAA for analytical sample identification.
3. **Data Recorder/Affiliation:** Trustee (state or federal representative) responsible for entering data on data sheet for that site. Enter name and affiliation following the format First Last (Primary Affiliation/Secondary Affiliation). Ex: Jane Doe (Shaw/CPRA/LA), John Doe (AIS/NOAA), Jim Doe (Cardno ENTRIX/BP)
4. **Other Team Members:** Include additional parties involved with data collection for that site. Enter name and affiliation - see #3 for format.
5. **Vegetation Transect Markers:** Note the presence or absence of the initial shoreline, initial inland, and Fall 2012 marsh edge stake. If the initial Inland stake is present, indicate NA for its replacement. If the initial shoreline stake or the Fall 2012 Marsh Edge stake is missing, it will not be replaced. If the initial inland stake is missing and the team has a Trimble unit, replace the stake. If for any reason, this stake is not replaced, note that in the logbook.
6. **Station Markers:**
 For any plot, if 1 or 2 PVC poles that mark the plot are missing, then replacement PVC poles should be employed to re-mark plots fully.
 For any plot, if 3 PVC poles that mark the plot are missing, then replacement PVC poles should be carefully employed to re-mark plots fully according to the following constraints. Plots must be carefully re-established in such a fashion that they do not include former areas of destructive sampling, such as soil core collection or walk paths outside of the plot. Consult the “Site Visit/Set Up Datasheet” to verify distances as appropriate.
 If all the PVC poles marking a plot are missing, then see below.
 - a. If PVC poles are missing due to erosion then this plot cannot be re-established.
 - b. If PVC poles are missing due to factors other than erosion (e.g., vandalism) and there is clear evidence of the location of the plot (e.g., markings from PVC poles or previously collected cores), then the plot should be re-established in the same location.
 - c. If PVC poles are missing due to factors other than erosion (e.g., vandalism) and there is not clear evidence of the location of plot, then the plot should be revisited with a Trimble GPS and reestablished using coordinates provided by NRDA Field Ops, previous Site Set-Up datasheets, and the GPS as a guide.
 If a plot is submerged or partially submerged, it should be sampled to the extent feasible and should not be re-established at a different location. Any signs of erosion should be noted on the datasheets and in the field notebook. If the water depth exceeds 15 cm, the site should not be sampled. Rather, the water depth should be recorded in the logbook, no datasheets should be filled out, and the site should be revisited when the water level is lower.
 Enter a number value from 0-4 for the number of absent and replaced stakes; because all mangrove plots were established, do not enter NA for any of these blanks.
 Estimate the extent of *horizontal* erosion as a percentage of the original plot size as seen from above. If the plot is not eroded, enter 0% in this field. If the plot is completely eroded, enter 100% in this field.
7. **Bearing to Inland Stake:** Record this value from the Site Set-Up datasheet.
8. **Bearing Inland Stake to Shoreline Stake:** Calculate this value by adding 180° to line 6 if the bearing is between 0° and 180° or subtracting 180° from line 6 if the bearing is between 180° and 360°.
9. **Transect Length:** Record this value from the Site Set-Up datasheet.
10. **Distance from Inland Stake to Marsh Edge:** Distance should be recorded in meters.
11. **Oil Distribution:** Circle the appropriate oil distribution based on the surface area coverage of the oil. If no oil was observed beyond the inland stake, circle NA. Consider an area approximately 10m on either side of the transect to the farthest inland point of observed oil or 20 m inland of the inland stake, whichever is closest to the inland stake.
12. **Note:** if no oil or trace oil (<1%) was observed beyond the inland stake, write NA for the following fields.
Distance from Inland Stake: Record the distance parallel to the transect of the inland stake to the farthest inland point of observed oil. This measurement should be made along the transect. If farthest inland point of observed oil is beyond 20 m inland of the inland stake, write '>20'.
Photos: Take at least 2 photographs of the observed oiling and record the photograph numbers.
Waypoint: Take a waypoint at the farthest inland point of observed oil.
Note: directions for all photographs are from the photographer’s perspective.
13. **Photos: Upon Arrival:** Note the photo number(s) for each of the two types of photos to be taken upon arrival.
14. **Photos: During Data Collection:** Note the photo numbers(s) for each of the six types of photos to be taken during data collection.
15. **Photos: Upon Departure:** Note the photo numbers(s) for each of the two types of photos to be taken upon departure.

Mangrove Marsh Cover Plot Datasheet – 1m x 4m (Fall 2013 – v1)

- Team #:** Assigned by NRDA Field Operations for the purpose of radio communications and field assignments. The format should be state abbreviation-team #.
Example: LA-1
Date: mm/dd/yy
Time (24hr): Actual time plot sampled; time should not be the same for all plots at the site. Time should be recorded in 24hr notation – example: 1:00 pm should be recorded as 13:00. Louisiana observes daylight savings time. Please be aware of the time of year and time changes.
- Site ID:** Actual site number to be referenced on all datasheets and samples. Assigned by NRDA Field Ops. Clean-up sites have a dash (ex. B-01).
Sampler Team Code: Alphanumeric-provided by NOAA for analytical sample identification.
- Data Recorder:** Trustee (state or federal representative) responsible for entering data on data sheet for that site. Enter name and affiliation following the format First Last (Primary Affiliation/Secondary Affiliation). Ex: Jane Doe (Shaw/CPRA/LA), John Doe (AIS/NOAA), Jim Doe (Cardno ENTRIX/BP)
- Other Team Members:** Include additional parties involved with data collection for that site. Enter name and affiliation - see #3 for format.
- Habitat Type/Plot ID:** Consult Figure 1 and select the corresponding plot ID for habitat type. There will be one cover plot data sheet per zone.



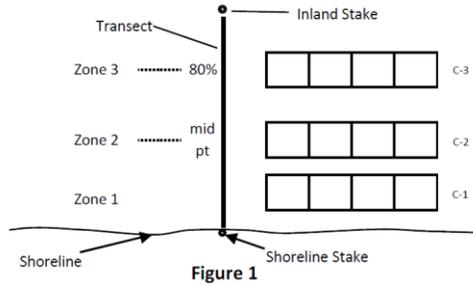
Note: all transect lengths are 20 m.

Figure 1

- Water on Marsh:** Record water depth in centimeters-should be measured in the plot and represent an average water depth for the entire plot. If no water is on marsh, write NA for depth. Note: No data can be collected if greater than 15 cm.
- Mangrove Vegetation Condition Index - Adults:** mangrove adults are classified as plants ≥ 50 cm in height.
NA = No vegetation in plot.
0 = Vegetation having a natural appearance, stem/leaf chlorosis not exceeding a slight mottling or occasional yellowing as observed in reference plots.
0.5 = Vegetation having an intense speckled chlorosis.
1.0 = Vegetation green but with considerable chlorosis (<50% chlorosis).
2.0 = Vegetation having >50% yellowing (chlorosis) of leaves and stems.
3.0 = Vegetation dead; no green aboveground tissue visible.
Note: Vegetation Condition Index should be determined on live tissue only, unless all vegetation is dead (Vegetation Condition Index = 3.0).
- Mangrove Vegetation Condition Index – Seedlings:** mangrove seedlings are classified as plants <50cm in height. Refer to #7 for index key.
- Dominant Herbaceous Vegetation Index:** Refer to #7 for a description and key for this index.
- Sediment Surface Oiling Coverage:** Estimate of percentage of visible oiled sediment observed.
- Adult (≥ 50 cm) Tree Veg. Oiling Extent Index:**
NA = No vegetation in plot .
0 = No oil evident anywhere in the plot.
0.5 = Oil intermittently present on plant stems.
1.0 = Oil present on 5%-25% of plant stems.
2.0 = Oil present >25%-50% of plant stems.
3.0 = Oil present on > 50% of plant stems.
Note: Oiling Index should be determined by the presence/absence of oil observed on a percentage of stems within the plot, not by oiling degree.
- Seedling (<50cm) Tree Veg. Oiling Extent Index:** Refer to #11 for a description and key for this index.
- Total Live Cover:** Estimate of percentage of LIVE vegetation cover observed within the plot.
- Total Dead Cover:** Estimate of percentage of DEAD vegetation cover (brown leaf matter) observed within the plot.
- Total Vegetative Cover:** Estimate of percentage of ALL vegetative cover observed within the plot - should be the sum of #s 13 & 14.
- Wrack Cover:** Estimate of percentage of vegetative wrack cover within the plot.
- Debris Cover:** Estimate of percentage of debris cover within the plot-boards, trash, etc.
- Photos:** 45° L: collect with back against transect; 45° R: collect facing transect. Photos should be obtained prior to disturbing plot area. A white board should also be employed with the following information: Site ID, Plot ID, and Date. White board should always be placed in lower left hand corner of plot for consistency. Note: Photos should be obtained utilizing a camera with a minimum of 10 mp resolution.
Waypt: Record GPS waypoint at each plot.
- Boom Cover:** Estimate of percentage of boom cover within the plot if present.
- Mangrove Avg Live Canopy Height (cm):** Average CANOPY height of MANGROVE species in centimeters. Note: not total height measurement; does not include inflorescence. If there are no mangroves in the plot, write NA.
- Dominant Herbaceous Species Avg. Live Canopy Height:** Average LIVE CANOPY height of DOMINANT HERBACEOUS species in centimeters. Note: not total height measurement; Record the height only in this field and note the dominant herbaceous species in the appropriate field in the Cover by Species section (see #24 below). If there is no herbaceous cover in the plot, write NA.
- Herbaceous Vegetation Stature:** ST=standing, LO=laid over (specifically for Spartina dominated plots). If no herbaceous cover in plot, write NA.
- Maximum Live Tree Height:** Measured from sediment surface to tip of the tallest living leaf. If there are no mangroves in plot, write NA.
- Cover by Species:** Identify each species with an estimation of percentage of live and dead cover relative to the entire plot. Note: acceptable to be >100% due to overlapping species within canopy. This percentage should be absolute cover and may also be greater than total cover-Ex: total live cover = 60%, species A = 50%, species B = 15%. Note the dominant species based on live vegetation by circling the appropriate species name in the left-hand column. This species should be the one used for obtaining the metric in #21 (dominant herbaceous species average live canopy height). Use blank rows to add species additional to those preprinted. If a species is not present, enter a "0" for the "Live Cover" and "Dead Cover" metrics.

Mangrove Plot Datasheet – 1m² (Fall 2013 – v1)

- Team #:** Assigned by NRDA Field Operations for the purpose of radio communications and field assignments. The format should be state abbreviation-team #. Example: LA-1
Date: mm/dd/yy
Time (24hr): Actual time plot sampled; time should not be the same for all plots at the site. Time should be recorded in 24hr notation – example: 1:00 pm should be recorded as 13:00. Louisiana observes daylight savings time. Please be aware of the time of year and time changes.
- Site ID:** Actual site number to be referenced on all datasheets and samples. Assigned by NRDA Field Ops. Clean-up sites have a dash (ex. B-01).
Sampler Team Code: Alphanumeric-provided by NOAA for analytical sample identification.
- Data Recorder:** Trustee (state or federal representative) responsible for entering data on data sheet for that site. Enter name and affiliation following the format First Last (Primary Affiliation/Secondary Affiliation). Ex: Jane Doe (Shaw/CPRA/LA), John Doe (AIS/NOAA), Jim Doe (Cardno ENTRIX/BP)
- Other Team Members:** Include additional parties involved with data collection for that site. Enter name and affiliation - see #3 for format.
- Habitat Type/Plot ID:** Consult Figure 1 and select the corresponding plot ID for habitat type. There will at least one plot datasheet per zone; supplemental sheets may be used to record additional tag numbers and associated data for live adults and seedlings.



Note: all transect lengths are 20 m.

- Oiling Height:** Highest point of observed oil on vegetation on the stem, recorded in centimeters. For laid over vegetation, if vegetation can be stood up, oiling height should be measured from base of stem to the highest point observed on stem. If vegetation is heavily oiled and cannot be stood up or is oiled stubble, enter HO (heavily oiled) instead of measurement. If there is new growth but no oiling, enter '0.' If there is no new growth, write 'NA.'
- Number of Pneumatophores:** Count of all pneumatophore within entire 1m² plot. Pneumatophore may be present in 100% Spartina sites.
- Pneumatophore Avg Height:** Average height of observable pneumatophores within entire 1m² plot.
- Propagule Production Estimate:** Visually estimate the number of propagules present: <100, 100-500, 500-1000, >1000
- Live Adult Trees (≥50 cm in height):** All trees with attached prestamped aluminum tags in the plot should be identified. This tag should be on the main stem immediately above the first branch or node from the sediment surface. Record the Tag No., Live-Dead-New-Missing status, Height (of individual tree), Main Stem Diameter (at 10 cm height), Canopy Diameter (measure largest diameter from outer leaf to outer leaf then perpendicular measurement), Number of Live Primary Branches (off main stem), and Number of Dead Primary Branches (off main stem). If tree is dead or tag is missing, record only the Tag No. and Live-Dead-New-Missing status. Use the tallest stem as the main stem. If more rows are needed to record all live adult trees in the plot, continue on page MSupp1, the Supplemental Adult datasheet and circle 'Yes' for line 11.
- Mangrove Plot Supplemental Adult Datasheet Completed for this plot:** If the Supplemental Adult datasheet was used as a continuation to this datasheet, circle 'Yes.' If the Supplement Adult datasheet was not needed, circle 'No.'
- Live Seedlings (<50 cm in height):** As with adult trees, prestamped aluminum tags with aluminum wire should be located immediately above the first branch or node. If new seedlings have colonized the plot, then tag, circle 'New' in the Live-Dead-New-Missing column and collect all data as described below.
Record Tag No., Live-Dead-New-Missing status, Height (of individual tree), Main Stem Diameter (at 5 cm height), and Number of Leaves. On unbranched seedlings also measure Number of Main Stem Nodes and Main Stem Internodal Distance (measured from first node to highest node (not top of growth)).
If seedling is dead or tag is missing, record only the Tag No. and Live-Dead-New-Missing.
Note: For at least one tree and one seedling per plot, measurements will be independently generated by two team members. Both the original and duplicate measurement will be marked with "FD" before the Tag No.
If more rows are needed to record all live seedlings in the plot, continue on page MSupp2, the Supplemental Seedling datasheet and circle 'Yes' for line 13.
- Mangrove Plot Supplemental Seedling Datasheet Completed for this plot:** If the Supplemental Seedling datasheet was used as a continuation to this datasheet, circle 'Yes.' If the Supplement Seedling datasheet was not needed, circle 'No.'

Mangrove Marsh Sample Collection Datasheet – 1m² (Fall 2013 – v1)

- Team #:** Assigned by NRDA Field Operations for the purpose of radio communications and field assignments. The format should be state abbreviation-team #.
Example: LA-1
Date: mm/dd/yy
Time (24hr): Actual time plot sampled; time should not be the same for all plots at the site. Time should be recorded in 24hr notation – example: 1:00 pm should be recorded as 13:00. Louisiana observes daylight savings time. Please be aware of the time of year and time changes.
 - Site ID:** Actual site number to be referenced on all datasheets and samples. Assigned by NRDA Field Ops.
Sampler Team Code: Alphanumeric or numeric-provided by NOAA for analytical sample identification.
 - Data Recorder:** Trustee (state or federal representative) responsible for entering data on data sheet for that site. Enter name and affiliation following the format First Last (Primary Affiliation/Secondary Affiliation) Ex: Jane Doe (Shaw/CPRA/LA), John Doe (AIS/NOAA), Jim Doe (Cardno ENTRIX/BP)
 - Other Team Members:** Include additional parties involved with data collection for that site. Enter name and affiliations-see #3 for format.
 - Habitat Type/Plot ID:** Consult Figure 1 and select the corresponding plot ID for habitat type. There will be one sample collection datasheet per plot.
Station Diagram: Place and 'X' in the correct location of the 1 m x 1 m intensive survey plot in the 1 m x 4 m mangrove plot. Follow the guidance provided on the pages 6-7 to determine the appropriate locations to collect samples relative to the 1 m x 1 m intensive plot. Draw in circles with relevant labels (SS-1, SS-2, SS-3, SS-4, B, SCP, SCC) on the station diagram to indicate where the samples were collected per the guidance on pages 6-7.
- 6-12. **Sample Collected:** Indicate whether or not the sample was collected.
Time: Enter the time at which the sample was collected. Time should be entered in 24hr format with a colon. Example 1 pm should be 13:00.
Grid Code: NRDA sample grid. Grid code may be entered once for all samples collected.
YearDate: Year letter (A=2010, B=2011, C=2012, D=2013) and mmdd. YearDate may be entered once for all samples collected.
Matrix: Matrix letter (Tissue=T and Soil=L). This field is prelisted for all samples.
Sampler Team Code: Alphanumeric or numeric-provided by NOAA for analytical sample identification. This code may be entered once for all samples.
Site ID: Site number to be referenced for samples. This ID may be entered once for all samples and should be entered as a 4 digit number (add leading zeros if needed).
Plot Type: Productivity or cover plot. This field is prelisted for all samples.
Zone ID: Zone location (from #5). This ID may be entered once for all samples.
Sample Type: Each sample type is prelisted on the sample collection table and explained in the notes below the table. The sample types are also depicted on Figure 2 below, which illustrates a properly completed station diagram for a plot with a leftmost 1 m x 1 m intensive plot and no erosion. **NO CLIP SAMPLES COLLECTED FOR MANGROVES.**
Sample Depth: The proper sample collection depth is prelisted in each cell for the corresponding sample type. Please ensure that the samples have been collected from the appropriate depths as indicated by measuring the recovery from each sample collection location or core.
Core Type: Type of corer used in obtaining the sample. This field is prelisted for all samples.
Summary Notes: for Fall 2013, the following samples should be collected utilizing the specified devices or methods as indicated on datasheet diagrams:
B = Belowground Biomass-16 cm stainless steel sampler - 30 cm depth. Extrude sample into Ziploc or plastic storage bag.
SCP= Soil Core-Physical Characterization-7.2 cm aluminum sample tube - 10 cm depth (collect from each plot type as indicated). Extrude sample into Ziploc storage bag.
SCC = Soil Core-Chemical Characterization-7.2 cm aluminum sample tube - 10 cm depth (collect from each plot type as indicated). Extrude sample into Ziploc storage bag.
SS = Soil Scoops (collected as indicated on datasheet diagram utilizing a gloved hand-2 cm depth). Place into glass jars.
- Photos:** Collect one photo of the below ground biomass sample recovery. A white board should also be depicted in the photo with the following information: Site ID, Date, & Plot ID.
Waypoint: Record GPS waypoint at each plot.

Station Diagram

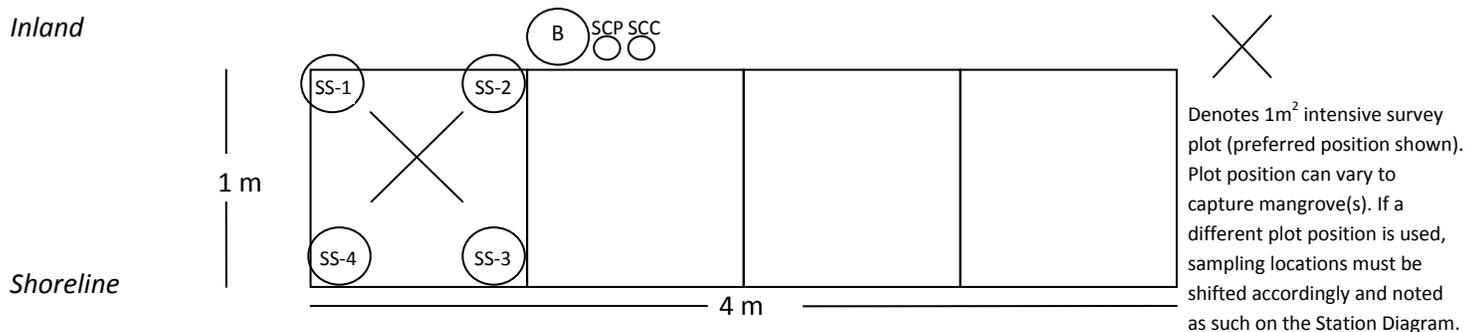


Figure 2

Mangrove Guidance: Sampling in Plots (Fall 2013 – v1)

Note: If all plots at the site have been previously reported as being buried by more than 2 cm, the Site Set-Up Verification datasheet should be completed, noting the Distance from the Inland Stake to Marsh Edge, and the arrival and departure photos should be taken. Remaining fields on the Site Set-Up / Verification datasheet should be completed as possible.

1. Samplers should first determine whether they can take a fully intact below ground biomass (BGB) core based on sufficient non-eroded marsh, not previously cored or exposed to heavy foot traffic, to allow for filling the core diameter. If possible, samples should be taken along the top right edge (looking inland) of the mangrove-intensive plot offset away from the plot up to 0.5 m (Figure 1). If not possible, the BGB coring location can be relocated as follows:
 - a. If the mangrove-intensive plot is in location 1, 2, or 3 based on Figure 4, looking inland and there is not sufficient non-eroded marsh for BGB coring in the preferred location as described above, the location can be moved farther to the **RIGHT** of the mangrove-intensive plot along the inland edge **up to a maximum distance of 1 m from the mangrove-intensive plot**. If the inland edge along the 1 m distance shows evidence of previous coring or heavy foot traffic such that a BGB core should not be taken, the sampling location can be moved to the inside of the 1 m x 4 m plot following the same lateral movement guidance of not exceeding the 1 m maximum distance from the intensive plot. Ensure that the sampling locations are clearly marked and labeled on the Station Diagram on the Mangrove Sample Collection Datasheet.
 - b. If the mangrove-intensive plot is in location 4 based on Figure 4, looking inland and there is not sufficient non-eroded marsh for BGB coring in the preferred position as described above, the location can be moved farther to the **LEFT** of the mangrove-intensive plot along the inland edge **up to a maximum distance of 1 m from the mangrove-intensive plot**. If the inland edge along the 1 m distance shows evidence of previous coring or heavy foot traffic such that a BGB core should not be taken, the sampling location can be moved to the inside of the 1 m x 4 m plot following the same lateral movement guidance of not exceeding the 1 m maximum distance from the intensive plot. Ensure that the sampling locations are clearly marked and labeled on the Station Diagram on the Mangrove Sample Collection Datasheet.
- The figure on page 7 summarizes the decision making process for selecting the core sampling locations at mangrove sites. If all plots at the site are fully eroded, the erosion of all plots should be confirmed by completing the Site Set-Up Verification Sheets, noting full erosion for each plot and the Distance from the Inland Stake to Marsh Edge, and completing arrival and departure photos. The remaining information on the Site Set-Up Verification Sheet should be completed as possible.
2. The soil **cores for physical (SCP) and chemical (SCC) analyses should be relocated to the same area** as the belowground core location. If there is not sufficient non-eroded marsh for both cores, **preference should be given to the SCC core**.
 3. **Soil contaminant scoops should not be relocated**, but taken with the mangrove-intensive plot corners where there is non-eroded marsh. Therefore, it is possible that fewer than 4 scoops will be able to be collected. Soil contaminant scoops should be labeled following the standard guidance given in the Coastal Wetland Vegetation Plan and associated QRGs.
 4. **All coring locations (whether relocated or not) should be clearly indicated on the 1m x 4 m plot diagram as described on Page 5, #5.**
 5. All other mangrove (non-coring) data collection should proceed as stated in the Coastal Wetland Vegetation Plan for mangroves within the established plot boundaries.

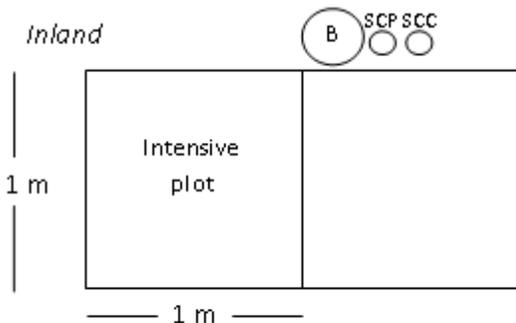


Figure 3: Location of core samples relative to mangrove-intensive plot if fully intact BGB core can be taken.

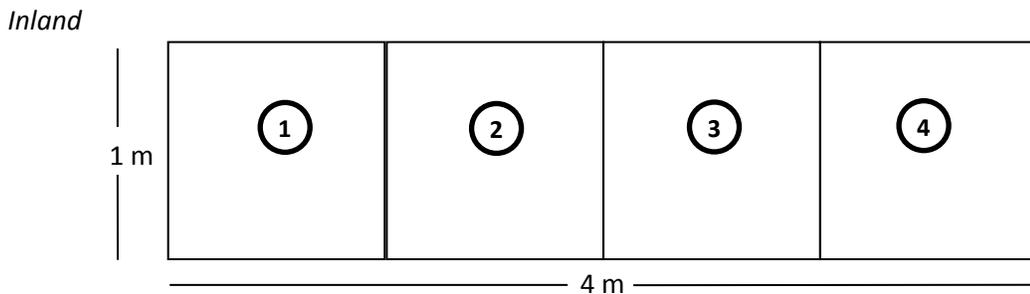
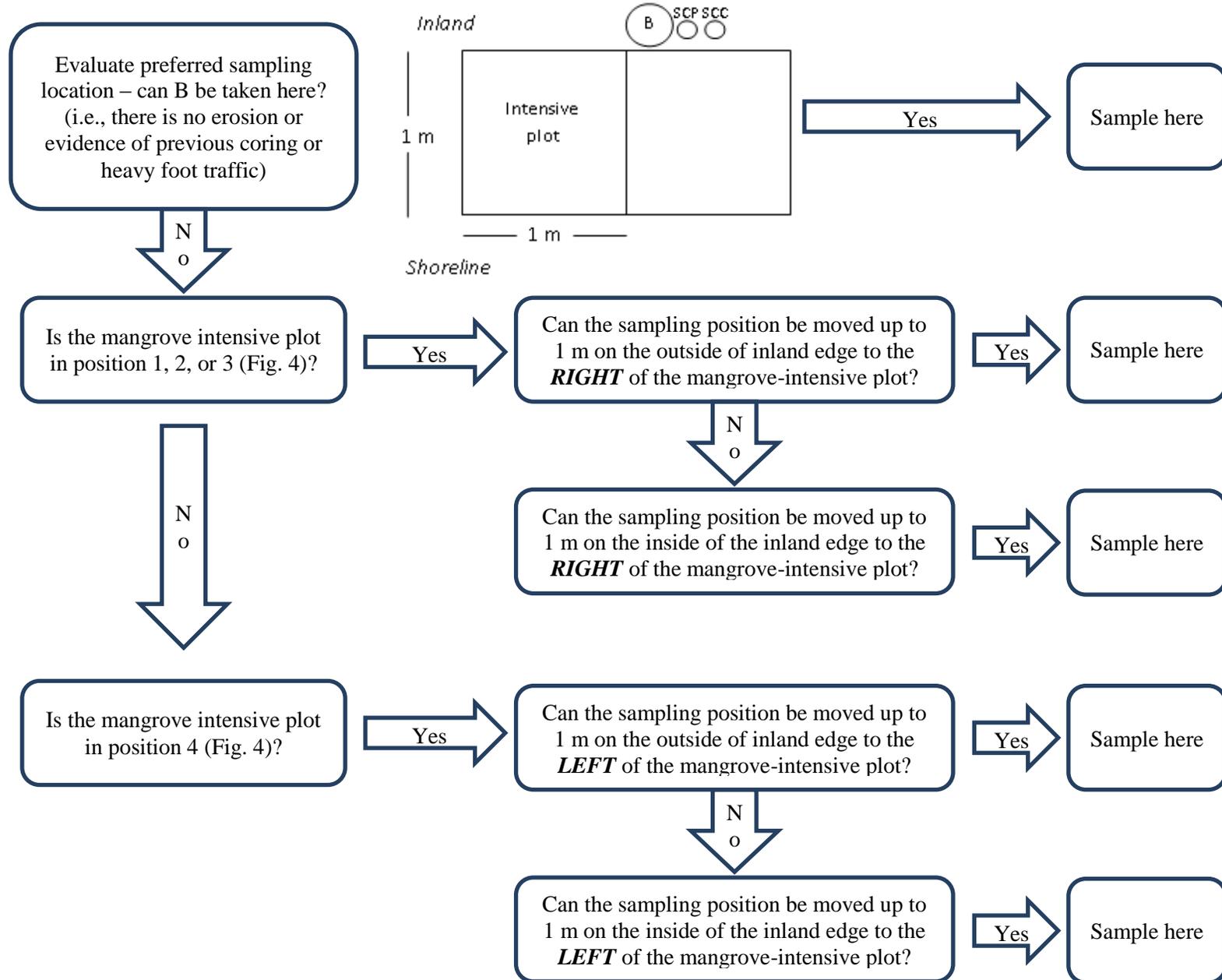


Figure 4: The four positions of the 1 m x 1 m mangrove-intensive plot. On the Station Diagram on the Mangrove Sample Collection Datasheet, place an 'X' in the position of the mangrove-intensive plot for that zone.

Mangrove Guidance: Sampling in Plots: Sample Core Location Determination Flow Chart (Fall 2013 – v1)



Equipment Checklist

_____	Clipboard	_____	White board
_____	Write-in-the-rain Pens	_____	Dry erase markers
_____	50 m measuring tape	_____	Datasheets
_____	Small metric tape measure or level rod	_____	Waterproof labels
_____	Compass	_____	Map book with GPS coordinates and sample grid ID
_____	Book with site set-up sheets	_____	Tyvek suits and other safety gear
_____	PVC-10' long, 1½" wide (at least 3 per site)	_____	Nitrile gloves
_____	PVC-10' long, ¾" wide (18 per site for new set-up)	_____	Stainless steel below-ground biomass sampler with extruder, cap, and clamps
_____	Pole driver	_____	Shovel
_____	Hand saw	_____	Trowel
_____	Flagging tape (arctic grade)	_____	Field knife
_____	Sharpies	_____	8 oz. wide mouth sample jars
_____	Multi tool	_____	1 and 2 gal. Ziploc bags, black contractor, and white kitchen garbage bags
_____	1 m quadrats (4)	_____	7.2 cm aluminum corer with cap, extruder, and metal file
_____	½ x ½ m quadrat	_____	Coolers
_____	Boot covers (1 pair per person per site)	_____	Heavy duty paper towels and decontamination supplies
_____	Trash bags or drum liners	_____	DI water (laboratory grade)
_____	Quick Reference Guide	_____	Alconox
_____	Trimble GEO XH	_____	2 spray bottles
_____	Camera	_____	5 gallon bucket
_____	Spot tracker	_____	Scissors
_____	700 MHz radio	_____	Tape – clear and duct
_____	700 MHz radio charger	_____	Stadia Rod
_____	VHF radio	_____	Stainless steel meter stick
_____	VHF radio charger	_____	Toothbrush
_____	Personal flotation devices	_____	Calipers (at least 2)
_____	Extra batteries (AA, AAA lithium, and other types as needed)	_____	Aluminum tree tags/wire
_____	Wooden stakes (for Refuge property)	_____	Counters
_____	Permits and safety forms	_____	Work/Kevlar gloves
_____	Vessel safety checklists	_____	Hip/chest waders
		_____	List of tag numbers at each site

Year 3, Fall 2013

Labor ^{1,2}					
Position	Number	Rate (\$/hr)	Days	Hours	Cost
<i>Federal³</i>					
QA floater (LA sampling)	1	█	50	11	█
Field team leads (LA sampling)	4	█	50	11	█
Field team staff (LA sampling)	4	█	50	11	█
Field team staff (AL sampling)	1	█	14	11	█
Field team leader (DOI representative for MS)	1	█	14	11	█
<i>Federal contractor labor costs</i>					█
<i>State</i>					
Field crew (ADCNR/GSA)	4	█	11	11	█
Field chief (ADCNR/GSA leads)	2	█	14	11	█
Field crew (MS)	2	█	14	11	█
Field chief (MDEQ lead)	2	█	16	11	█
LA labor (see Attachment 1 for details) ⁴					█
<i>State labor costs</i>					█
Labor Total					█

¹ All NOAA and State Trustee labor costs are recoverable under NRDA but are not calculated here, other than AL and MS field sampler costs specified above.

² Includes time for HAZWOPER and CPR/First Aid courses and the field training session.

³ All federal costs are NOAA's unless otherwise specified.

⁴ LA labor costs include all equipment and materials costs.

Laboratory Costs			
	Number	Rate (\$/sample)	Cost
Aboveground clips	271	\$800	\$216,800
Belowground cores	327	\$600	\$196,200
Soil cores - physical and chemical	622	\$800	\$497,600
PAH analysis	311	\$1,000	\$311,000
Lab Costs Total			\$1,221,600

Travel					
	Unit	Rate (\$/unit)	Days	Number	Cost
<i>Federal</i>					
Meals - QA floater (LA sampling)	day	█	44	1	█
Lodging - QA floater (LA sampling)	day	█	44	1	█
Meals - field team leads (LA sampling)	day	█	44	4	█
Lodging - field team leads (LA sampling)	day	█	44	4	█
Meals - field team staff (LA sampling)	day	█	44	4	█
Lodging - field team staff (LA sampling)	day	█	44	4	█
Meals (AL sampling)	day	█	14	1	█
Lodging (AL sampling)	day	█	14	1	█
Meals (DOI representative for MS)	day	█	14	1	█
Airplane (LA and AL sampling)	trip	█	N/A	20	█
<i>Federal contractor travel costs</i>					█
<i>State</i>					
Overnight Per Diem-Meals & Lodging- AL Rate (GSA Staff)	day	█	11	3	█
Day Trip Per Diem-AL Rate (ADCNR Staff)	day	█	14	3	█
Meals (MS)	day	█	18	4	█
Lodging (MS)	day	█	18	4	█
Airplane (MS)	trip	█	N/A	1	█
<i>State travel costs</i>					█
Travel Total					█

Coastal Wetland Vegetation Plan Budget
8/16/2013

Draft - v1

Other Direct Costs				
	Unit	Rate (\$/unit)	Number	Cost
<i>Federal</i>				
Car rental	per day	█	410	█
Bay boat rental	per day	█	157	█
Air boat rental	per day	█	156	█
HAZWOPER training (24 hour)	per field person	█	20	█
CPR/First Aid certification	per field person	█	20	█
Shipping	per cooler	█	622	█
<i>Equipment⁵</i>				
Digital calipers	each	█	4	█
Biomass corer	each	█	2	█
Bulk density corer	each	█	2	█
Pocket knife/multi-tool	each	█	4	█
Non-disposable equipment (other)	per team	█	6	█
Sediment chemistry sampling jars	per sample	█	1,244	█
Other disposable supplies	per team, per year	█	6	█
<i>Federal ODCs</i>				
<i>State</i>				
Car mileage - AL	per day	█	14	█
Boat rental (bay boat) - AL	per day	█	25	█
Car mileage - MS	per day	█	18	█
Boat rental (bay boat) - MS	per day	█	32	█
Training facility rental - MS	per day	█	1	█
LA ODCs ⁶ *				
<i>State ODCs</i>				
ODCs Total				

⁵ BP has paid upfront for most or all non-disposable equipment costs. Trustees will only seek reimbursement for costs they paid for out-of-pocket. Purchase of equipment will be on an as-needed basis, and not all equipment noted above may need to be purchased.

⁶ Louisiana ODCs are built into the hourly labor rates and are captured in the LA labor line item above.

Total Costs Year 3, Fall 2013 █

**Louisiana Contract Labor/Equipment Costs for Impacts to Coastal Wetland Vegetation Plan
Year 3 Sampling - Fall 2013**

Personnel	Hourly Rate	Estimated Man-Hours	Total Labor Cost
Principal		22	
Senior Project Manager		200	
Project Manager		200	
Senior Scientist (3)		1,680	
Project Scientist (4)		2,240	
Staff Scientist (2)		1,120	
Scientific & Technical Editor		90	
Geographical Information System Analyst		40	
Administrative / Clerical		140	
Total		5,732	