

Southeast Coast Network

National Park Service
Inventory and Monitoring Division



Standard Operating Procedure 1.2.02

Park-wide Assessment Navigation and Field Evaluation of Sampling Locations—Version 2.0

Please cite this as:

Starkey, E. N., and D. McCay. 2022. Park-wide assessment navigation and field evaluation of sampling locations—Version 2.0. Southeast Coast Network Standard Operating Procedure NPS/SECN/SOP—1.2.02. Southeast Coast Network, Athens, Georgia.

Summary

This standard operating procedure (SOP) outlines the procedure for accessing sites and determining if they meet site selection criteria set by EPA and the National Park Service. The purpose of this SOP is to ensure that field teams use standardized criteria from year to year and from park to park. The techniques and procedures outlined in this SOP are based on the EPA National Coastal Condition Assessment Field Operations Manual (EPA 2009 and 2014a) and are modified to reflect concerns at parks due to possible disturbance of sea grass beds by boat or sampling equipment.

Revision Log

Revision Date	Author	Changes Made	Reason for Change	New Version #
1/17/2013		Citation updated	Protocol publication	1.0
3/9/2021	E. N. Starkey	Updates based on the 2014 NCCA field manual and SECN specific procedures. Photographs are now required. Updated equipment list. Included important navigational considerations. Outlined procedures for alternate site selection and naming convention.	Revised datasheets and database. Field experience since publication. New NCCA field manual.	2.0

Contents

	Page
Park-wide Assessment Activities and Workflow Summary	3
Equipment/Materials List.....	4
Procedures.....	5
Prior to Departure	5
Navigation and Initial Site Evaluation	5
Determine Site Sample-Ability and Suitability	8
Criteria for Years with Water-Quality Only.....	8
Criteria for Years with Water and Sediment Quality	8
Location and Event Data Collection.....	8
Alternate Sites	10
Literature Cited	10

Park-wide Assessment Activities and Workflow Summary

An overview of park-wide assessment activities and workflow are presented in Figure 1. SOPs are presented left to right in the general order of operations for each activity. This SOP (1.2.02) pertains to evaluation of the sample site during the Sample Site activity.

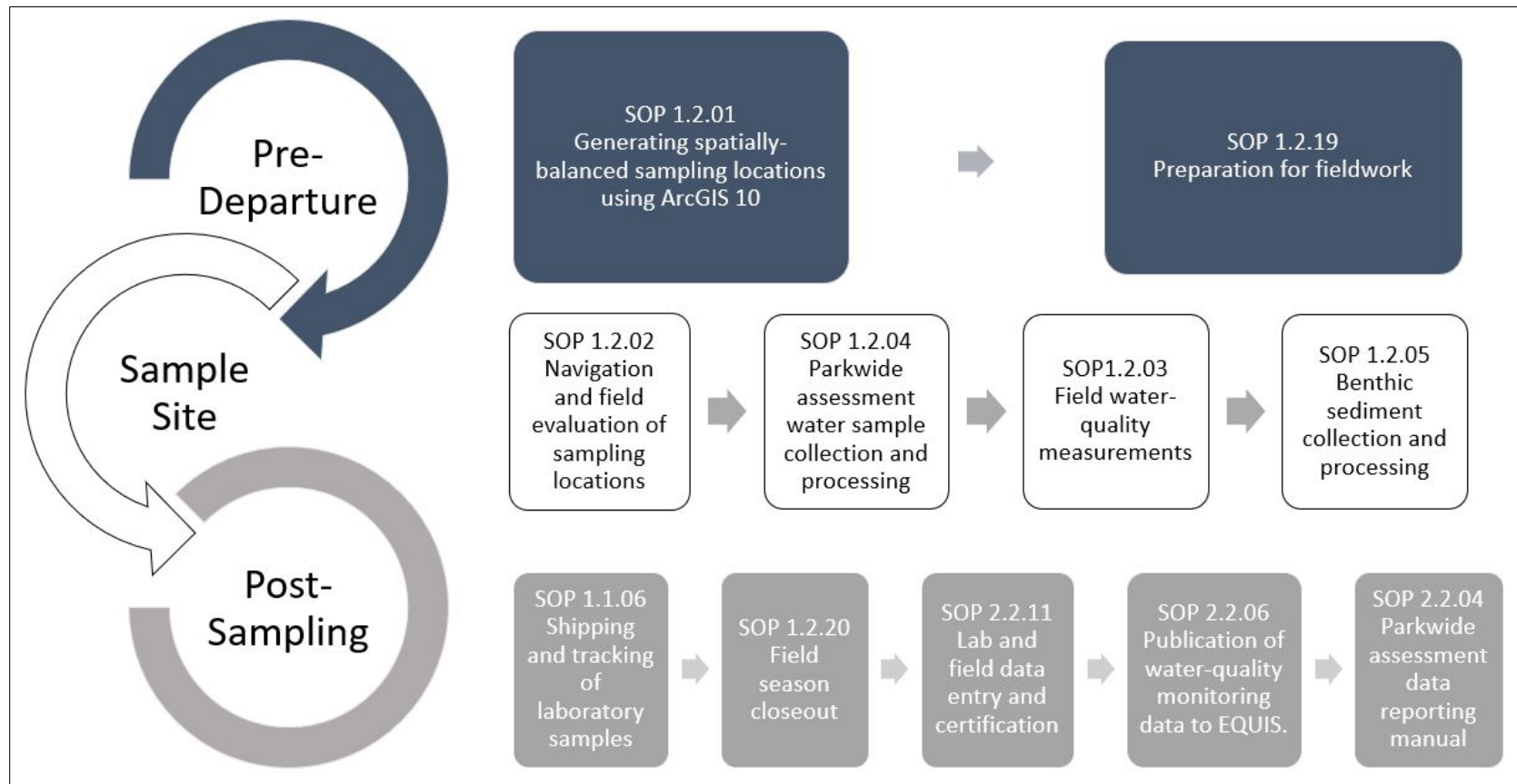


Figure 1. Park-wide assessment activities and workflow. SOPs are presented left to right in the general order of operations for each activity.

Equipment/Materials List

- Transportation
 - Shallow draft aluminum boat with capacity for crew and equipment for all park-wide assessment sampling activities.
 - Two anchors appropriate for substrate conditions
 - Push-pole
- Navigation
 - Marine chart plotter pre-loaded with sample points.
 - Handheld Global Positioning System (GPS) pre-loaded with sample points.
 - Paper charts (backup to chart plotter)
 - SECN map with sample sites and alternates
 - List of sites and alternates
 - Low and high tide times from nearest gage
- Sample Site Data Collection
 - Handheld weather meter with anemometer (e.g., Kestrel)
 - Compass
 - Camera
 - Monocular
 - Depth meter
 - Handheld GPS
 - Watch
 - Extra batteries: 1- 9v, 2- CR2032, 4-AA
 - SECN Park-wide Assessment: Location and Event Form

Procedures

Prior to Departure

1. Ensure that procedures outlined in SOP 1.2.19 *Park-wide Assessment Preparation for Fieldwork*—Version 1.0 (Starkey 2022) have been completed.
2. Load all equipment onto the boat and organize to facilitate completion of procedures.
3. Review sample locations, aerial imagery, and low/high tide times.

Navigation and Initial Site Evaluation

Note that the sample sites for SECN park-wide assessments are randomly distributed throughout and adjacent to park units (SOP 1.2.01 *Park-wide Assessment Spatially-Balanced Sampling Location Generation Using ArcGIS 10*—Version 2.0 [Cooper and Starkey 2022]). Sites are screened ahead of time to ensure sufficient water depth and access (SOP 1.2.19 [Starkey 2022]). However, during initial evaluation of the site, the crew may determine that an intended sample site is inaccessible or unsampleable. For this reason, a list of primary and alternate sites is provided. Site sample-ability/suitability is discussed in greater detail below.

1. Examine the intended sample site location on the chart plotter and aerial imagery, then determine the safest and most efficient route of travel.
2. Use the boat-mounted marine chart plotter to navigate to within 0.02 nautical miles (NM; 37 meters [m], 120 feet [ft]) of the designated sampling location.
3. **Navigation considerations**
 - a. **Due to the shallow nature of many sample locations throughout SECN parks, maintain a slow controlled speed when in route to a site. This will help avoid accidental grounding.**
 - b. **Access to some locations may require evaluation of water depth while in route. Use a push pole or depth meter to take periodic depth soundings.**
 - c. **Be cognizant of falling tides and account for falling water levels. Just because you can access a location, does not mean that you can navigate away from the same site at a lower tide level. Do not risk sampling extremely shallow locations on a falling tide. Sample shallow locations on a rising tide so that the boat will float if grounded.**
 - d. **Be on the lookout for and avoid shipping traffic. Even if you are not in the direct path of a ship, the boat wake can still be a hazard.**
4. Anchor the boat as close as possible to the designated sampling location. When working in currents or the wind, position the bow into the current or wind and play out anchor line until

the boat is over the sample location. Depending on conditions, two anchors may be required to maintain boat position.

5. Determine site sample-ability/suitability. If site characteristics or access restrictions preclude data collection at the exact sampling location, a reasonable attempt will be made to relocate the site within a radius of 0.02 NM (37 m, 120 ft) of the original point. Relocation of a site within the 0.02 NM radius will be done following these steps.
 - a. The boat captain will pick a compass heading (e.g., north, south, east, or west) and motor the vessel in that direction for 15–20 meters (49.2–65.6 ft; EPA 2014b).
 - b. The new location will be evaluated for sample-ability/suitability. If deemed sampleable the crew will proceed with Location and Event Data Collection. If the location is deemed un-sampleable, “this process may be continued using the same heading out to the 37 meters [0.02 NM] mark or using a new heading until an acceptable sampling location is found” (EPA 2014b). Record the reason for the shift on the Location and Event Form (Figure 2).
 - c. “If after a sufficient amount of effort is expended and no suitable site is found, then the determination may be made that the site is non-sampleable” (EPA 2014b). In these cases, attempt to access the first site on the prioritized list of alternate sampling locations.

SECN Parkwide Assessment: Location and Event Form

v2.5 (01/2021)

<u>Station Information</u>	
Station Name: _____ (e.g. CUIS27_2020, FOMA05_2018)	<u>Location Note</u>
Water Body Name: _____ Staging Area: _____ (e.g. access point/boat ramp)	
GPS UTM X: _____ UTM Y: _____ UTM Zone: _____ Datum (NAD83): _____ Zone 17 except CALO/CAHA = Zone 18	
Location within 0.02 NM (37 m) of original sample draw? (circle one): YES NO (if no, explain in comments)	
HABITAT TYPE (check all that apply) ☐ Tidal River ☐ Intertidal ☐ Marsh ☐ Open water ☐ Rocky/shell bottom ☐ Oyster bed ☐ Bayou/inlet ☐ Coral reef ☐ Other: _____	
DAY Arrival Date (MM/DD/YY): _____ Arrival Time (HH:MM): _____ EST Departure Date (MM/DD/YY): _____ Departure Time (HH:MM): _____ EST	
WEATHER Conditions at station: Wind (mph): _____ Temp (°C): _____ Cloud Cover/Sky (% cloudy): _____ Other: _____	
SUBMERGED AQUATIC VEGETATION Present? (Circle one) YES NO	
MARINE DEBRIS Present? (Circle one) YES NO Type (Circle one): Plastic Wood Glass Cans Other: _____	
COMMENTS	
Recorded By: _____ Computer Entry By / Date: _____ Accepted By / Date: _____	

<u>Photos</u>					
<table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Number</th> <th style="text-align: left; border-bottom: 1px solid black;">Camera Direction</th> </tr> <tr> <td style="font-size: small;">(From camera)</td> <td style="font-size: small;">(N., E., S., W)</td> </tr> </table>	Number	Camera Direction	(From camera)	(N., E., S., W)	
Number	Camera Direction				
(From camera)	(N., E., S., W)				
Captured By: _____					

Figure 2. Example of SECN Park-wide Assessment: Location and Event Form.

Determine Site Sample-Ability and Suitability

After anchoring the boat at or near the intended sample location and conducting an initial evaluation, the site is more thoroughly reviewed to determine if it is suitable for the intended sampling activity. The network samples water-quality parameters during each park-wide assessment event (5-year rotation), while sediment quality is evaluated every other event (10-year rotation). For more information regarding the sample rotation please refer to the protocol narrative (Gregory et. al. 2013). Due to this rotation, what is considered suitable for sampling changes in years including sediment sampling. Criteria for years with water quality only and years with both water and sediment quality are presented below. If criteria are met, proceed with data collection as outlined in the next section. If criteria are not met, reposition the boat within 0.02 NM (37 m) of the original point following procedures outlined in the section above “Navigation and Initial Site Evaluation.” If no suitable location is found within 0.02 NM (37 m) select the first available alternate sampling site from the list and return to the procedures outlined in the section above “Navigation and Initial Site Evaluation.” If an alternate site is used, see also the “Alternate Site” section below.

Criteria for Years with Water-Quality Only

1. Be within the area restrictions (< 0.02 NM) outlined in the initial site evaluation section.
2. Current velocities must allow for the measurement of Secchi depth and the hydrographic profile.

Criteria for Years with Water and Sediment Quality

1. Be within 0.02 NM (37 m) of the intended sample location.
2. Have a soft bottom (i.e., not rocky or oyster bed).
3. Be free of submerged aquatic vegetation (SAV; to prevent damage to SAV).
4. Current velocities must allow for successful sediment sampling, measurement of Secchi depth and the hydrographic profile.

Location and Event Data Collection

The following information will be recorded on the SECN Park-wide Assessment: Location and Event Form (Figure 2).

1. Station name formatted as PARK##_YYYY, where PARK is the park code, ## is the two-digit site number and YYYY is the year (e.g. CUIS27_2020). See explanation below when alternate locations are used.
2. Water body name—consult chart and station list for the correct name
3. Staging area—generally considered the boat ramp of departure
4. Actual coordinates of the sampling location in UTM. Include the UTM Zone and Datum.
5. Circle “Yes” or “No” if the site is within 37 meters (0.2 NM) of the original sample draw. If “no” explain why in the Location Notes.

6. Arrival date (MM/DD/YYYY) and time (HH:MM) (EST)
7. Fill in any location notes.
8. Determine the habitat type and check the appropriate box.
9. Determine the presence of submerged aquatic vegetation (SAV) within 10 meters (32.8 ft) of the boat and circle Yes (present) or No (absent) on the datasheet.
10. Determine the presence and type of marine debris within 10 meters (32.8 ft) of the boat. Check Yes or No and Circle the appropriate type of debris.
11. Use the Kestrel weather meter to determine wind speed (mph) and air temperature (°C) to the nearest 10th. Record the observations.
12. Visually estimate % cloud cover to the nearest 10% and record the observation.
13. Site Photos
 - a. Stand up in the boat.
 - b. Use the compass to determine North, East, South and West.
 - c. Use the digital camera to take photos in each direction (N, E, S, W). For consistency and ease of data entry, always take photos in the N, E, S, W order.
 - d. Record the file numbers associated with each photo and direction (Figure 2).
 - e. Fill in the Photos Captured By field.
14. Fill in the Recorded By field.
15. Proceed with water and/or sediment quality sampling activities outlined in SOP 1.2.03 *Park-wide Assessment Field Water-Quality Measurements*—Version 2.0 (Starkey and Gregory 2022a), SOP 1.2.04 *Park-wide Assessment Water Sample Collection and Processing*—Version 2.0 (Starkey and Gregory 2022b), and SOP 1.2.05 *Park-wide Assessment Benthic Sediment Collection and Processing*—Version 2.0 (Starkey and McCay 2022).
16. When all sample activities have been completed, record the departure date (MM/DD/YYYY) and time (HH:MM) (EST).

Alternate Sites

If an alternate site is selected because it is inaccessible or fails to meet sampling criteria, several considerations apply.

1. Station name: The station name is not formatted PARK-ALT##-YYYY or some combination thereof, but rather named for the intended sample site for which it is replacing (i.e., PARK##_YYYY). For example, station CUIS27_2020 was too shallow and rocky to sample, so an alternate site was selected from the prioritized list (CUIS-ALT02_2020). After navigating to CUIS-ALT02_2020 it is determined to be sampleable. On the datasheet and sample labels this site would be labeled as CUIS27_2020.
2. On the Location and Event form, “Location within 0.02 NM (37 m) of original sample draw?” should be responded to as if this is the original intended sample location. Alternates were part of the original sample draw. Additionally, make a comment on the Location and Event Form in the “Location Notes” section regarding the swapped points. Following the CUIS example from above the note would read “Original CUIS27_2020 was swapped for CUIS-ALT02_2020 due to insufficient depth at the original sample point.”
3. GPS: Record the location of the actual sampled site.

Literature Cited

- Cooper, C. S., and E. N. Starkey. 2022. Park-wide assessment spatially-balanced sampling location generation using ArcGIS 10—Version 2.0. Southeast Coast Network Standard Operating Procedure NPS/SECN/SOP—1.2.01. Southeast Coast Network, Athens, Georgia. Available at: <https://irma.nps.gov/DataStore/Reference/Profile/2284576> (last accessed June 2022).
- Gregory, M. Brian, J. C. DeVivo, E. M. DiDonato, C. J. Wright, and E. Thompson. 2013. Protocol for monitoring estuarine water and sediment quality in selected Southeast Coast Network parks. Natural Resource Report NPS/SECN/NRR—2013/644. National Park Service, Fort Collins Colorado, <https://irma.nps.gov/DataStore/Reference/Profile/2194106> (last accessed June 2022).
- Starkey, E. N. 2022. Parkwide assessment preparation for fieldwork—Version 1.0. Southeast Coast Network Standard Operating Procedure NPS/SECN/SOP—1.2.19. Southeast Coast Network, Athens, Georgia. Available at: <https://irma.nps.gov/DataStore/Reference/Profile/2294038> (last accessed July 2022).
- Starkey, E. N., and M. B. Gregory. 2022a. Park-wide assessment field water-quality measurements—Version 2.0. Southeast Coast Network Standard Operating Procedure NPS/SECN/SOP—1.2.03. Southeast Coast Network, Athens, Georgia. Available at: <https://irma.nps.gov/DataStore/Reference/Profile/2284595> (last accessed June 2022).

- Starkey, E. N., and M. B. Gregory. 2022b. Park-wide assessment water sample collection and processing— Version 2.0. Southeast Coast Network Standard Operating Procedure NPS/SECN/SOP—1.2.04. Southeast Coast Network, Athens, Georgia. Available at: <https://irma.nps.gov/DataStore/Reference/Profile/22284596> (last accessed June 2022).
- Starkey, E. N., and D. McCay. 2022. Park-wide assessment benthic sediment collection and processing—Version 2.0. Southeast Coast Network Standard Operating Procedure NPS/SECN/SOP—1.2.05. Southeast Coast Network, Athens, Georgia. Available at: <https://irma.nps.gov/DataStore/Reference/Profile/22284597> (last accessed June 2022).
- USEPA (EPA). 2009. National Coastal Condition Assessment: Field Operations Manual. EPA-841-R-09-003. U.S. Environmental Protection Agency, Washington, DC. 133 p.
- USEPA (EPA). 2014a. National Coastal Condition Assessment: Field Operations Manual. EPA-841-R-14-007. U.S. Environmental Protection Agency, Washington, DC. 165 p.
- USEPA (EPA). 2014b. National Coastal Condition Assessment: Site Evaluation Guidelines. EPA 841-R-14-006. U.S. Environmental Protection Agency, Washington, DC. 31 p.