
Bingham, S. N., C. C. Young, J. L. Haack-Gaynor , L. W. Morrison, and G. A. Rowell. 2016. Wetland monitoring protocol for Cuyahoga Valley National Park: Narrative. Natural Resource Report NPS/HTLN/NRR—2016/ 1336. National Park Service, Fort Collins, Colorado.

# Standard Operation Procedure 6: Plot Establishment in Intensively-Assessed Sentinel Wetlands

**Version 1.00 (12/27/2016)**

| Previous Version # | Revision Date | Author | Changes Made | Reason for Change | New Version # |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

# Contents



# Figures and Tables

# Standard Operation Procedure 6: Plot Establishment in Intensively-Assessed Sentinel Wetlands

## Overview

Sentinel wetlands, which include reference wetlands and wetlands of management concern, are sampled using sampling arrays. Eight reference wetlands are all sampled with a single sampling array. The wetlands of management concern include another eight wetlands that are large complexes, and seven out of eight of these required multiple sampling arrays for adequate characterization. The total number of all sampling arrays in sentinel sites is 37 (Table 6.1). Establishment of sampling arrays requires wetland delineation work (SOP 3), a randomized selection process (ArcGIS, Alaska Pak) and field verification.

## Placement of Sampling Arrays

### *Define Number of Sampling Arrays (Wetlands of Management Concern)*

Seven of eight wetlands of management concern consisted of multiple dominant wetland types (present in >0.2471 acre [0.1 ha] contiguous area), which required multiple sampling arrays. Polygons were used to define each representative wetland type (dominant plant community / hydrogeomorphic class combinations). The process required field and ArcGIS delineation work.

1. Clear changes in plant community (e.g. emergent, shrub, forest, meadow) and hydrology were identified (Attachment 5.1) and recorded using an aerial photograph and GPS during wetland delineation (see SOP 3).
2. The wetland area was dissected into polygons that represent each dominant plant community / hydrogeomorphic class (slope, riverine, depression) combinations using ArcGIS.
3. The resulting polygons were used to decide on the number of arrays needed to adequately characterize the wetland. *(e.g.,* If there is one dominant plant community in one HGM type and two dominant plant communities in another HGM type, then three VIBI plots would be necessary.)

### *Place a Sampling Array within Each Polygon*

1. ArcGIS Alaska Pak was used to generate random point locations within each wetland type.
2. GPS units were used to navigate (see SOP 2) to the centroids of intensively-assessed wetlands within each polygon.
3. Plot selection procedures roughly followed those described in SOP 5, *Placement of Sampling Arrays* section. A single random point was used as the starting location, but if the criteria listed above were not met, the exact placement allowed greater observer judgment (i.e, was less structured than for the randomly-selected wetlands).

**Table 6.1.** List of 37 intensively-assessed wetlands, identified by PlotID, and showing wetland name, sample set (reference or wetland of management concern[ WOMC]), dominant vegetation type, azimuth of the center line, array shape of modules, and location coordinates (UTM Zone 19 N, NAD 1983).

| Plot No | PlotID | WetlandName | SampleSet | Dominant Veg. Type | Azimuth Center Line | Array | X_Coord | Y_Coord |
|---|---|---|---|---|---|---|---|---|
| 1 | 1427 | Bath | Reference | forested | 90° | 2 x 5 | 451956.239329 | 4557257.599160 |
| 2 | 683 | BostonMills | Reference | shrub-shrub | 0° | 2 x 5 | 455170.534500 | 4567589.166150 |
| 3 | 554 | Columbia | Reference | emergent | 0° | 1 x 4 | 452285.982562 | 4568972.745800 |
| 4 | 970 | Fitzwater | Reference | forested | 0° | 2 x 5 | 449863.854815 | 4578175.339980 |
| 5 | 124 | Langes | Reference | shrub-scrub | 0° | 2 x 2 | 453847.660515 | 4562127.533240 |
| 6 | 398 | Snowville | Reference | emergent | 290° | 1 x 4 | 451543.095649 | 4570712.221000 |
| 7 | 526 | Stumpy | Reference | emergent | 0° | 2 x 5 | 454408.745700 | 4567140.493890 |
| 8 | 241K | Virginia Kendall | Reference/WOMC | emergent | 90° | 2 x 2 | 456153.332325 | 4562776.202940 |
| 9 | 970PV | Pleasant Valley | Survey / WOMC | forested | 144° | 2 x 5 | 449911.815264 | 4578266.878800 |
| 10 | 1079RS2 | Rockside | Survey / WOMC | emergent | 0° | 2 x 2 | 447083.081309 | 4582432.915790 |
| 11 | 365BM3 | Beaver Marsh | WOMC | emergent | 0° | 2 x 2 | 451391.660641 | 4559358.737340 |
| 12 | 365BM2 | Beaver Marsh | WOMC | emergent | 0° | 2 x 2 | 451198.660833 | 4559529.238070 |
| 13 | 365BM4 | Beaver Marsh | WOMC | forested | 180° | 2 x 5 | 451522.806753 | 4559879.213630 |
| 14 | 365BM5 | Beaver Marsh | WOMC | emergent | 330° | 2 x 2 | 451519.373793 | 4560095.169720 |
| 15 | 365BM6 | Beaver Marsh | WOMC | emergent | 302° | 2 x 4 | 451670.046817 | 4560334.262460 |
| 16 | 977FP1 | Fawn Pond | WOMC | forested | 90° | 2 x 5 | 450005.749088 | 4576513.516750 |
| 17 | 977FP2 | Fawn Pond | WOMC | emergent | 0° | 2 x 2 | 449807.231839 | 4576607.576390 |
| 18 | 977FP3 | Fawn Pond | WOMC | emergent | 0° | 2 x 2 | 450018.577504 | 4576854.829130 |
| 19 | 977FP4 | Fawn Pond | WOMC | emergent | 0° | 2 x 2 | 449929.178976 | 4577019.816780 |
| 20 | 977FP5 | Fawn Pond | WOMC | forested | 0° | 2 x 5 | 449938.991456 | 4577374.911440 |
| 21 | 968PV968 | Pleasant Valley | WOMC | emergent | 42° | 2 x 5 | 449100.999519 | 4578760.580940 |
| 22 | 969 | Pleasant Valley | WOMC | emergent | 120° | 2 x 5 | 449697.402975 | 4578825.406030 |
| 23 | 1043 | Pleasant Valley | WOMC | emergent | 355° | 2 x 5 | 448684.948318 | 4578711.000270 |
| 24 | 1047 | Pleasant Valley | WOMC | emergent | 323° | 2 x 5 | 448901.416287 | 4579130.870090 |
| 25 | 1049 | Pleasant Valley | WOMC | forested | 95° | 2 x 5 | 449676.377567 | 4579000.803530 |
| 26 | 526SB3 | Stumpy Basin | WOMC | forested | 0° | 2 x 5 | 454333.341924 | 4566853.348930 |
| 27 | 526SB2 | Stumpy Basin | WOMC | forested | 0° | 2 x 5 | 454293.667428 | 4567145.250500 |
| 28 | 526SB1 | Stumpy Basin | WOMC | emergent | 0° | 2 x 2 | 454278.286180 | 4567261.859910 |
| 29 | 241VK4 | Virginia Kendall | WOMC | emergent | 102° | 1 x 3 | 455927.332453 | 4562814.243520 |
| 30 | 242VK1 | Virginia Kendall | WOMC | emergent | 86° | 2 x 2 | 456096.224485 | 4563161.566650 |
| 31 | 242VK2 | Virginia Kendall | WOMC | forested | 110° | 2 x 5 | 456306.969061 | 4563191.892160 |
| 32 | 540SF1 | Stanford | WOMC | emergent | 0° | 2 x 2 | 453130.287675 | 4569393.440660 |
| 33 | 540SF2 | Stanford | WOMC | emergent | 0° | 2 x 2 | 453113.750898 | 4569463.449830 |
| 34 | 540SF3 | Stanford | WOMC | emergent | 0° | 2 x 2 | 453209.960396 | 4569427.511180 |
| 35 | 540SF4 | Stanford | WOMC | emergent | 0° | 2 x 2 | 453244.011986 | 4569513.765510 |
| 36 | 1622KR1 | Krejci | WOMC | emergent | 0° | 2 x 2 | 454954.070943 | 4568242.931670 |
| 37 | 1627KR2 | Krejci | WOMC | emergent | 0° | 2 x 2 | 454728.741149 | 4568433.300940 |