

Table of Contents for Report Modules

Module pages are numbered separately with a prefix corresponding to this outline.
(Sections of the report included on this CD appear in blue.)

Executive Summary

Background
Approach
Simulated application for Pennsylvania
Summary of accomplishments
(Figure 1)

Acknowledgements

I. New Approaches for Wetlands Monitoring and Assessment

A. Background

Brooks, Robert P., and Doreen Vetter. Wetlands Protection: Evolving from Quantity to Quality
(Submitting: National Wetlands Newsletter)

B. Rationale for the Cooperative Agreement – Brooks, Robert P.

□

C. Wetlands Monitoring Matrix

Brooks, Robert P., Denice Heller Wardrop, and C. Andrew Cole.
Monitoring wetlands for inventory, condition assessment, and restoration potential on a watershed basis; a case study from the Spring Creek watershed, Pennsylvania, USA.
(Submitted: Environmental Management)

□

II. Methods, Results, and Products

A. Reference Wetlands and Hydrogeomorphic Classification

Concepts of Reference Wetlands
Use of Reference in the Hydrogeomorphic (HGM) Approach
Selection of Reference Wetlands in Pennsylvania
Classification of Reference Wetlands in Pennsylvania
Recommended Steps for Establishing a Regional Set of Reference Wetlands
Terminology and Definitions
HGM Wetland Classification Key for Pennsylvania
(Figures 1-7, Summary Table)

B. Wetlands Monitoring Matrix - Levels 1, 2, and 3

1. Level 1 – Remote Inventory and Condition Assessment

a. Level 1 - Synoptic Watershed Assessments

Brooks, Robert P., Denice Heller Wardrop, and Joseph A. Bishop. 2004. □Assessing wetland condition on a watershed basis in the Mid-Atlantic region using synoptic land cover maps. □Environmental Monitoring and Assessment 94:9-22.

b. Level 1 - Pennsylvania Wetlands Assessment

Brooks, Robert P., Joseph A. Bishop, and Denice Heller Wardrop. □2004. □Preliminary Wetlands Condition Assessment for Pennsylvania using the National Wetlands Inventory.

2. Level 2 Enhanced Inventory and Rapid Condition Assessment
 - a. [Level 2 – Enhanced Wetlands Inventory](#) – Geology as a predictor of wetland occurrence within the Ridge and Valley physiographic province of central Pennsylvania. McLaughlin, Karen, Denice Heller Wardrop, Jennifer K. Perot, and Robert P. Brooks. (Submitted: Journal of the Pennsylvania Academy of Science)
 - b. [Level 2 – Rapid Condition Assessment](#)
Brooks, Robert P., Denice Heller Wardrop, and Joseph A. Bishop.
([Figure 1](#), [Figures 2 & 3](#))
3. Level 3 – Intensive Condition Assessments (HGM and IBI)
 - a. [Wetland Sampling Protocol in support of Hydrogeomorphic \(HGM\) Functional Assessment](#). Wardrop, Denice Heller, Robert P. Brooks, Laurie Bishel-Machung, C. Andrew Cole and Jennifer M. Rubbo.
 - b. Hydrogeomorphic Functional Assessment Models (HGM)
 1. Clairain, Ellis J. 2002. Hydrogeomorphic approach to assessing wetland functions: Guidelines for developing regional guidebooks; Chapter 1, Introduction and overview of the hydrogeomorphic approach. Pages 1-27 in ERDC/EL TR-02-3, U.S. Army Engineer Research and Development Center, Vicksburg, MI. (not included here)
 2. [Hydrogeomorphic Model Building Process](#).
Rubbo, Jennifer M., and Robert P. Brooks.
([Ecoregion Table](#))
 3. [Hydrogeomorphic Variables](#): Definitions, Rationale, and Scoring. Brooks, Robert P., Denice Heller Wardrop, Jennifer M. Rubbo, Wendy M. Mahaney, and C. Andrew Cole.
 4. Hydrogeomorphic functional assessment models by wetland type for Pennsylvania ecoregions. Brooks, Robert P., Jennifer M. Rubbo, Denice Heller Wardrop, Wendy M. Mahaney, and C. Andrew Cole.
[Riparian Depression](#)
[Isolated Depression](#)
[Slope](#)
[Headwater Floodplain](#)
Mainstem Floodplain (available at a later date)
Fringe (available at a later date)
 5. [Level 3 – Reference Wetlands HGM Scores for Pennsylvania](#). Penn State Cooperative Wetlands Center.
([Tables](#))
 6. [Hydrogeomorphic Functional Assessment Models – Sensitivity Analysis](#).
Brooks, Robert P., Denice Heller Wardrop, and Jennifer Masina Rubbo
 - c. Indices of Biological Integrity (IBIs) - Flora and Fauna
 1. Flora
 - a. Vascular Plants

- b. Farr, Melinda M. 2003. Amphibian assemblage response to anthropogenic disturbance in Pennsylvania wetlands. M.S. Wildlife and Fisheries Science. 90pp.
- c. Wetland Birds IBI. Brooks, Robert P. and Timothy J. O'Connell (available at a later date)

□

III. Recommendations

Suggestions for implementation in Pennsylvania

□

IV. Summary of Presentations, Workshops, Meetings, and Outreach Activities

□

V. Summary of Publications (Articles, Reports, Theses)

□

VI. Appendices (available at a later date)

CD with data

CD of photographs

Site ownership and access

□

▣

Please cite the overall report as follows:

Brooks, R. P. (ed.). 2004. Monitoring and Assessing Pennsylvania Wetlands. Final Report for Cooperative Agreement No. X-827157-01, between Penn State Cooperative Wetlands Center, Pennsylvania State University, University Park, PA and U.S. Environmental Protection Agency, Office of Wetlands, Oceans, and Watersheds, Washington, DC.

□

Individual sections should be cited using the format of this example:

Laubscher, Susan E., and Angela M. Conklin. 2004. Wetland Macroinvertebrates in Pennsylvania: Level 3 Condition Assessment using Indices of Community Integrity (ICIs). Part I.3.c.2.a. R. P. Brooks (ed.). Monitoring and Assessing Pennsylvania Wetlands. Final Report for Cooperative Agreement No. X-827157-01, between Penn State Cooperative Wetlands Center, Pennsylvania State University, University Park, PA and U.S. Environmental Protection Agency, Office of Wetlands, Oceans, and Watersheds, Washington, DC.