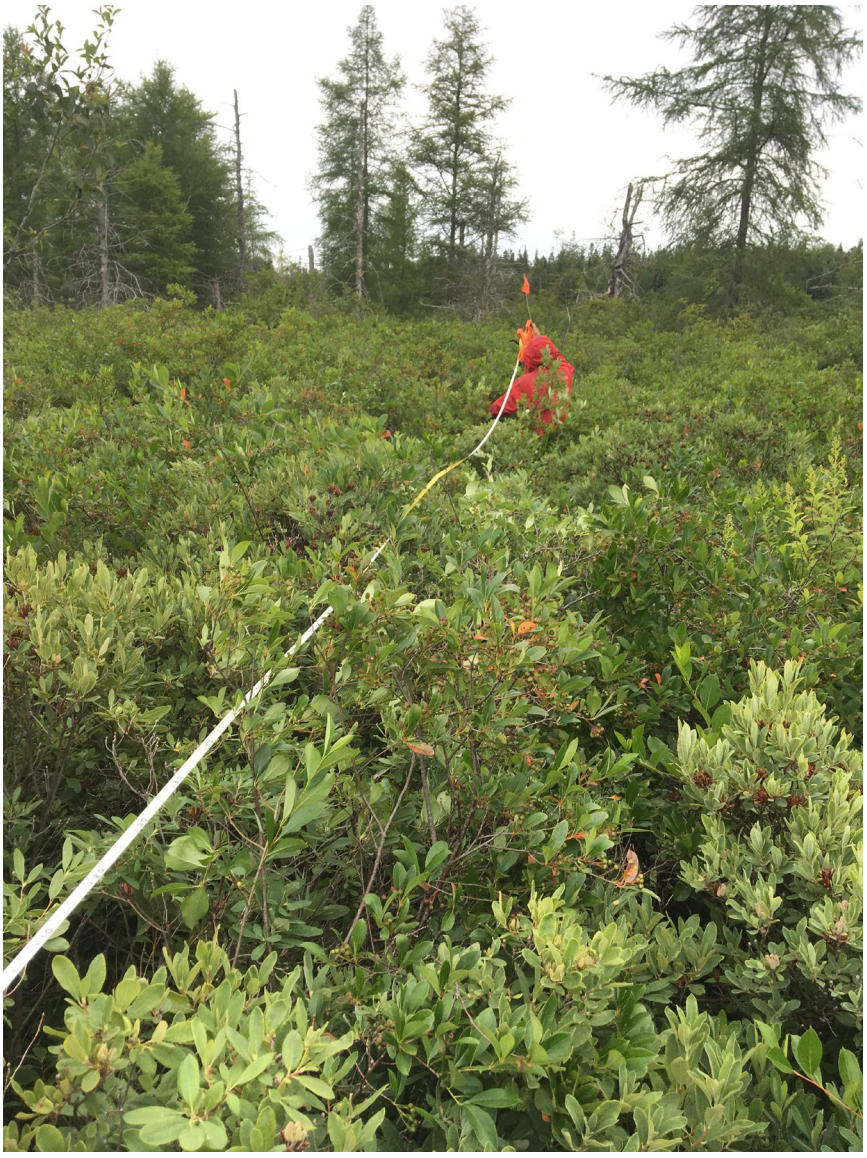
National Park Service
U.S. Department of the Interior

Northeast Temperate Network
Inventory & Monitoring Division

Summary of Major Protocol Changes and Deviations for the Northeast Temperate Network Permanent Freshwater Wetland Monitoring Program



ON THE COVER
Alex Gould running a transect, NPS photo

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This is a self-published addendum to the Northeast Temperate Network's Permanent Freshwater Wetland Monitoring Protocol. The current protocol, standard operating procedures, data, and other information can be found online on the IRMA Data Store at https://irma.nps.gov/Datastore/Reference/Profile/2208704.

For more information on NETN's Permanent Freshwater Wetland Monitoring Program, visit NETN's website at https://www.nps.gov/im/netn/freshwater-wetlands.htm

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Revision History

Version numbers will be incremented by a whole number (e.g., Version 1.3 to 2.0) when a change is made that significantly affects requirements or procedures. Version numbers will be incremented by decimals (e.g., Version 1.3 to Version 1.4) when there are minor modifications that do not affect requirements or procedures included in the protocol. Rows are added to the log as needed for each change or set of changes tied to an updated version number.

Revision History Log

Version #	Date	Revised by	Changes	Justification
1.00	January 2020		Initial version	

Executive Summary

This document summarizes changes in the protocol methods and/or data quality that affect data analysis for the NETN Permanent Freshwater Wetland Monitoring Protocol (https://irma.nps.gov/Datastore/Reference/Profile/2208704). Protocol changes that do not affect data quality or analysis, such as changes in equipment that do not affect data quality or precision, are documented in the Revision History section of each field SOP, and are not listed here.

Overview

This document summarizes known deviations in methods, major protocol changes, and updates to the sentinel site descriptions for the Northeast Temperate Network (NETN) Permanent Freshwater Wetland Monitoring Protocol.

- Known deviations are situations where data were collected in a manner that is substantially different from the methods documented within the SOPs used during a particular field season and may affect data analysis and interpretation over the period of observation.

- Major changes are fundamental shifts in the way data are collected that cannot easily be rectified with earlier data that will affect data analysis and interpretation. Major changes are not deviations, provided that the changes are documented in the SOPs. Ideally, any time there is a major change in methods the networks will use both methods long enough to determine whether the results from the different methods are sufficiently correlated to allow old data to be corrected. In some cases (especially early in the use of the protocol), the small amount of data lost by the protocol change will not be worth the cost of overlapping methods.

- Updates to sentinel sites are updates, such as beaver occupation or culvert replacements that will likely affect trends in sentinel wetland vegetation, soils, water chemistry and/or hydrology, but that may not be picked up during the years that the NWCA is implemented. These changes are often observed during the annual spring or fall well visits, and are recorded here to help inform future analyses.

This protocol has a three-tiered monitoring approach, level 1 is a GIS-based monitoring of landscape condition, level 2 is a rapid field assessment, and level 3 is an intensive field assessment. NETN conducts level 3, intensive monitoring in 10 sentinel sites, which were non-randomly selected to represent the least disturbed condition of various wetland types in ACAD. Sentinel sites are sampled every five years during the EPA NWCA, and following EPA's Field Operation Manual (FOM; U.S. EPA 2016a). Levels 1 and 2 are implemented across 40 randomly located sites, which are sampled during the four years between the NWCA. Levels 1 and 2 are hereafter referred to as rapid assessment monitoring (RAM). RAM methods follow the USA-Rapid Assessment Manual (USA-RAM; U.S. EPA 2011), with the addition of a timed plot search for plant species (see SOP 4 – Rapid Assessment Site Establishment). Because of the tiered approach, we summarize deviations and major changes separately for the EPA FOM and NETN-specific SOPs.

Known Deviations and Major Changes

NETN procedures compared to the EPA FOM

Numerous changes and updates were made to the EPA FOM between the 2011 and 2016 EPA NWCA. The information below is not an exhaustive list of all of the changes made between 2011 and 2016, but rather summarize the major changes that affect data availability and/or data analysis for NETN sentinel sites.

USA-RAM

During the first NWCA in 2011, EPA implemented the USA-RAM (U.S. EPA 2011) as part of the assessment. During the second NWCA in 2016 and later, the USA-RAM was dropped from the assessment.

This means that the USA-RAM was only implemented in NETN sentinel sites in 2011. NETN continues to implement the USA-RAM as part of RAM monitoring in the 40 RAM sites.

Algae

In 2011, EPA collected algae as part of the assessment. Starting 2016 and later, EPA dropped algae sampling from the assessment. Because of this, the algae multimetric index (MMI) that we developed (Miller et al. 2016), is only useful for rating 2011 sentinel sites.

Water Chemistry

In 2011, surface water needed to be at least 15 cm deep to be collected and analyzed for water chemistry. Using this depth requirement, only 6 out of 10 of the NETN sentinel sites had water of sufficient depth to be collected. Starting in 2016 and later, surface water did not have a minimum depth requirement for collection, resulting in 7 out of 10 sites with surface water samples.

NETN SOPs

Water Level Data

2014 & 2019: The growing season for water level monitoring is defined as May 15 to October 1. However, occasionally road closures due to late springs have delayed the spring well checks beyond May 15, thereby shortening the period that we can calculate growing season water level statistics. Years affected are 2014 and 2019.

2017: Due to logger failure during the growing season of 2017, there is no water level data available for this period in the Duck Pond sentinel site.

RAM Monitoring

2012 to 2014: % Bryophyte cover in the 40-m radius Assessment Area was not collected.

2015 and later: % Bryophyte cover was added to RAM monitoring because it is a metric in the vegetation MMI. % Bryophyte cover for visits prior to 2015 were populated by the value during the second visit, so that the vegetation MMI could be rated during each visit.

Updates to Sentinel Site Descriptions

Since monitoring began in 2011, conditions in the sentinel sites have periodically changed, including occupation or abandonment by beaver, culvert replacements, and new parcels added the park that increase level of protection in a given wetland's watershed. Many of these changes have occurred in the years between NWCA monitoring, and were observed during the spring or fall well visits. To ensure these observations are documented and can help inform analyses, we include updates to the sentinel site descriptions here.

Gilmore Meadow

An active beaver colony was also located near the outlet when monitoring began in 2011. However the beaver lodge and dam were removed by park maintenance staff in the spring of 2017, and as of October 2019, the outlet remains unoccupied by beaver. After removal of the lodge, water levels dropped significantly in the wetland, and have remained low as of 2019.

Duck Pond Peatland

At the start of monitoring in 2011, this wetland was transitioning from a low shrub and sedge dominated fen to a white cedar fen. White cedar seedlings and saplings were relatively common throughout the wetland. However, starting in 2012, this wetland was reoccupied by beaver and many of the white cedar seedlings present in 2011 have since died and the wetland has become more graminoid-dominated. As of 2019, this wetland continues to be influenced by beaver impoundment and the vegetation is dominated by graminoids and other emergent plants.

Frazer Fen

When this sentinel site was established in 2011, only 62% of the watershed was in park ownership. After the addition of the Schoodic Woods parcel in 2015, the watershed containing Frazer Fen is now entirely within park ownership.

Heath Brook

At the outlet of this wetland, Heath Brook flows through a culvert on Seal Cove Road. Seal Cove Road has had roughly the same route since 1887, which suggests that a culvert draining Heath Brook has likely been in place as long. However during the summer of 2015, the culvert at the mouth of this wetland was replaced with a larger opening to facilitate fish passage.

Literature Cited

Miller, K. M., B. R. Mitchell, and B. J. McGill. 2016. Constructing multimetric indices and testing ability of landscape metrics to assess condition of freshwater wetlands in the Northeastern US. Ecological Indicators 66: 143-152.

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