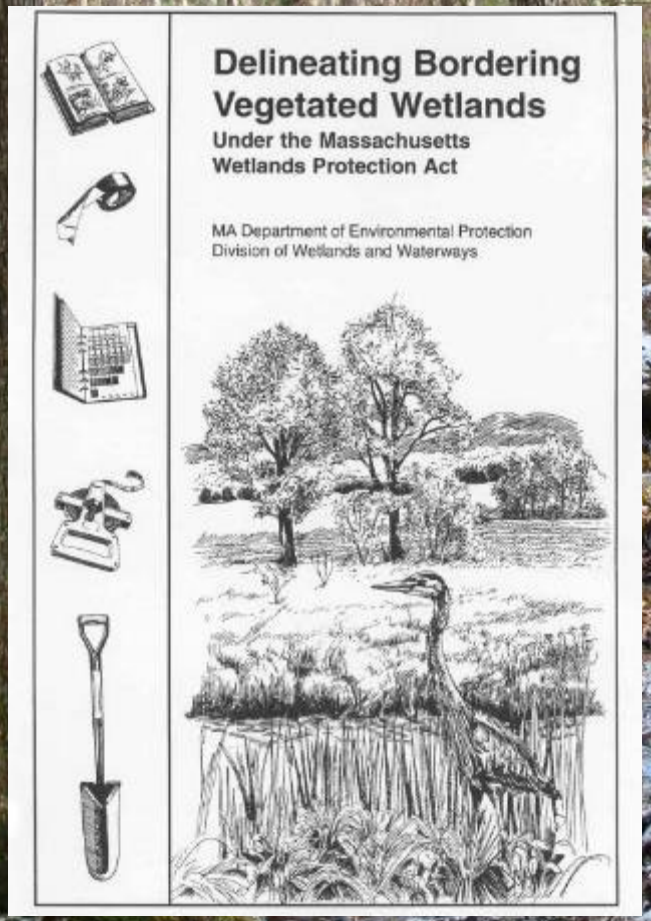
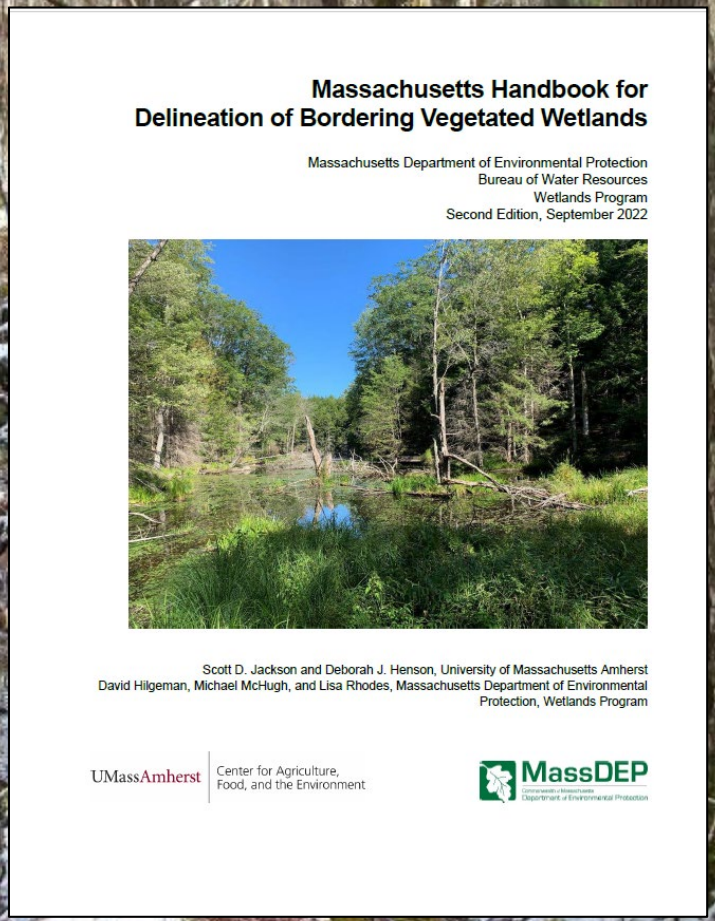
Update of the BVW Delineation Handbook Vegetation and Other Indicators of Hydrology





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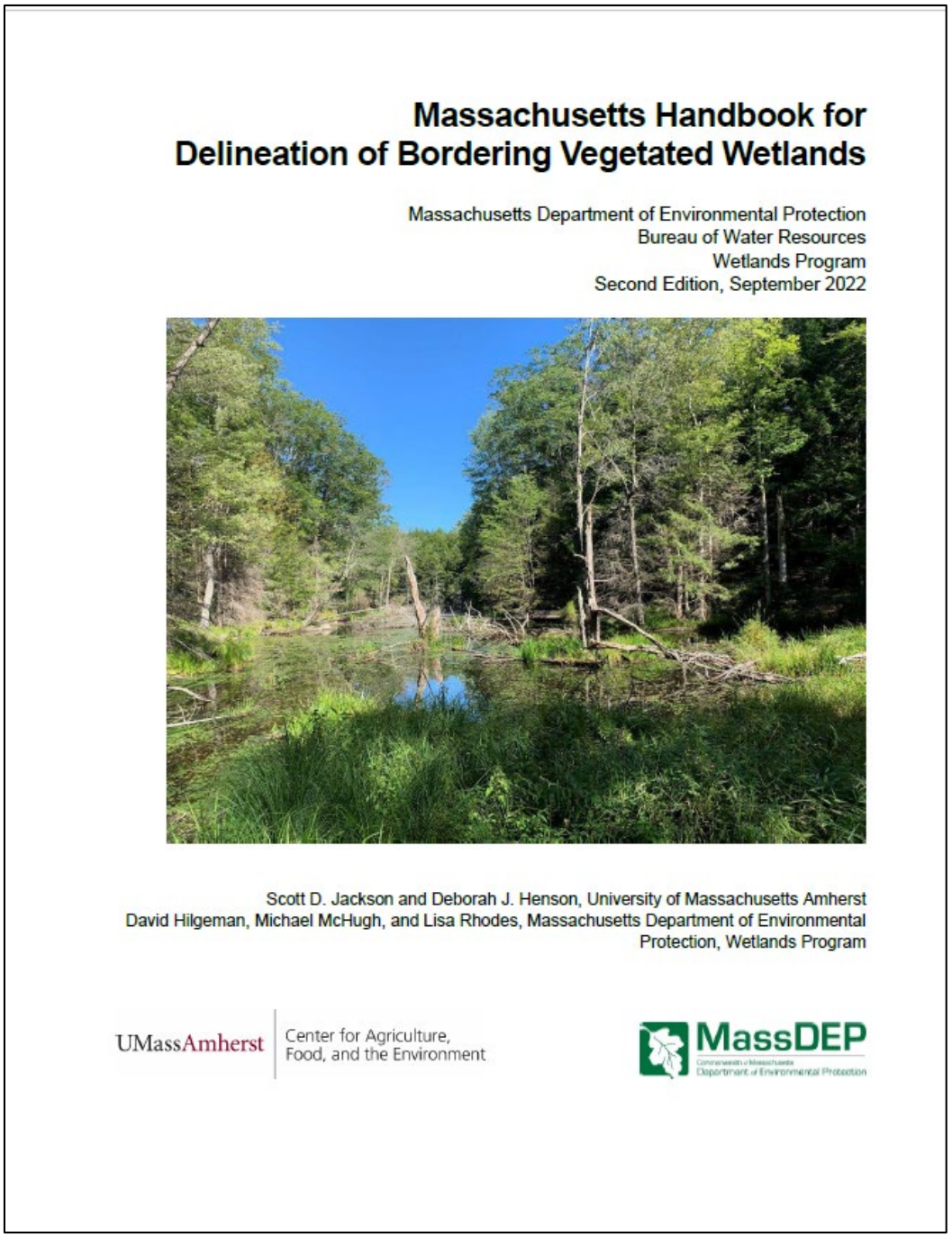
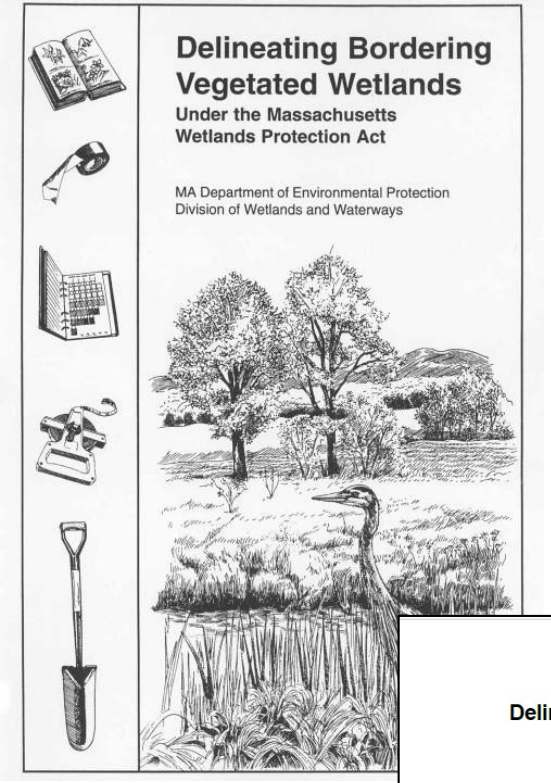
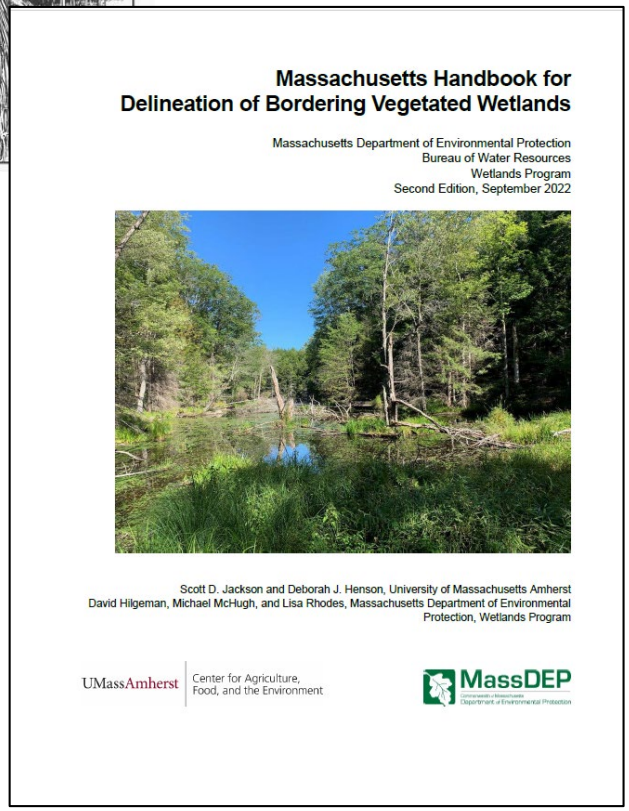


2022 Delineation Manual: Vegetation & Other Indicators of Hydrology

- Chapter 2: Vegetation
- Chapter 4: Other Indicators of Wetland Hydrology
- Chapter 5: Delineating & Reviewing BVW Boundaries
  - Criteria for Determining that an Area is Wetland
- Appendix B: Assessing the Vegetative Community
- Appendix C: Wetland Indicator Plants Identified in the Massachusetts WPA





Delineation Manual Update: Vegetation & Other Indicators of Hydrology

- Discourage the use of vegetation alone to delineate BVWs
- Reference 2020 plant list
- More flexible 2+ parameter approach
- Adopt federal hierarchy for vegetation analysis
- Adopt federal vegetative layers
- Deemphasize use of circular plots in favor of strip transects
- Other indicators of hydrology presented in three groups

310 CMR 10.55(2)
BVW Definition, Critical Characteristic & Boundary

(a) Bordering Vegetated Wetlands (BVWs) are freshwater wetlands that border on creeks, rivers, streams, ponds and lakes

(c) Boundary is the line within which ≥ 50% of vegetative community consists of wetland indicator plants and saturated or inundated conditions exist.

1. Boundary based on ≥ 50% wetland indicator plants shall be presumed accurate when
   a. All dominant species have an indicator status of obligate or facultative wetland and the boundary is distinct or abrupt
   b. Work is limited to the buffer zone
   c. The issuing authority determines that delineation by vegetation is sufficient.
2. Otherwise, delineate based on vegetation and hydrology (hydric soils being an indicator of hydrology)
3. Disturbed sites: BVW is area that supports or would support a predominance of wetland indicator plants

Characteristics of Wetlands

- **Hydrology:** saturation or inundation during the growing season sufficient to produce anaerobic conditions in the upper part of the soil
- **Vegetation:** areas where a significant part of the vegetative community is made up of plants adapted to wetland conditions
- **Soil (hydric soil):** a soil that is saturated, ponded, or flooded long enough during the growing season to cause anaerobic conditions in the upper part

Massachusetts Two-plus Parameter Approach

Undisturbed sites with all dominant plants Obl or FacW and boundary that is clear and abrupt

- Wetland vegetation alone can be used

Undisturbed Sites with Soils that are not Difficult to Analyze

- Wetland vegetation and hydric soils (recommended)
- Wetland vegetation and other indicators of hydrology

Disturbed Sites

- Evidence of altered hydrology: Use plants, soils and hydrology
- Evidence of altered vegetation: Use soils and hydrology
- Evidence of altered vegetation and soils: Use hydrology and/or historic data
- Wetlands with fill: Use soil (below the fill) and hydrology
- Recently drained sites: Use soils

USFWS Indicator Categories Occurrence in Wetlands

Plant Indicator Status Categories (Occurrence in Wetlands)		
Category	**Abbreviation**	**Descriptor**
Obligate wetland	OBL	Almost always occur in wetlands
Facultative wetland	FACW	Usually occur in wetlands
Facultative	FAC	Occur in wetlands & non-wetlands
Facultative upland	FACU	Usually occur in non-wetlands
Upland	UPL	Almost never occur in wetlands

Wetland Indicator Plants

- Plant species listed in Wetlands Protection Act and species in the genus *Sphagnum*
- Plants in the National List with indicator category of FAC, FACW or OBL
- Plants adapted to life in saturated or inundated conditions


Sphagnum


Eastern Hemlock (FacU)

Hierarchy for Vegetation Analysis

- Rapid Test
- Dominance Test
- Prevalence Index
- Morphological Adaptations

Question: Does the new manual intended to prohibit the HYDROPHYTIC COVER INDEX (2014a_Lichvar_Gillrich)?

Response: No. The handbook does not intend to prohibit the use of other vegetation assessment methodologies.

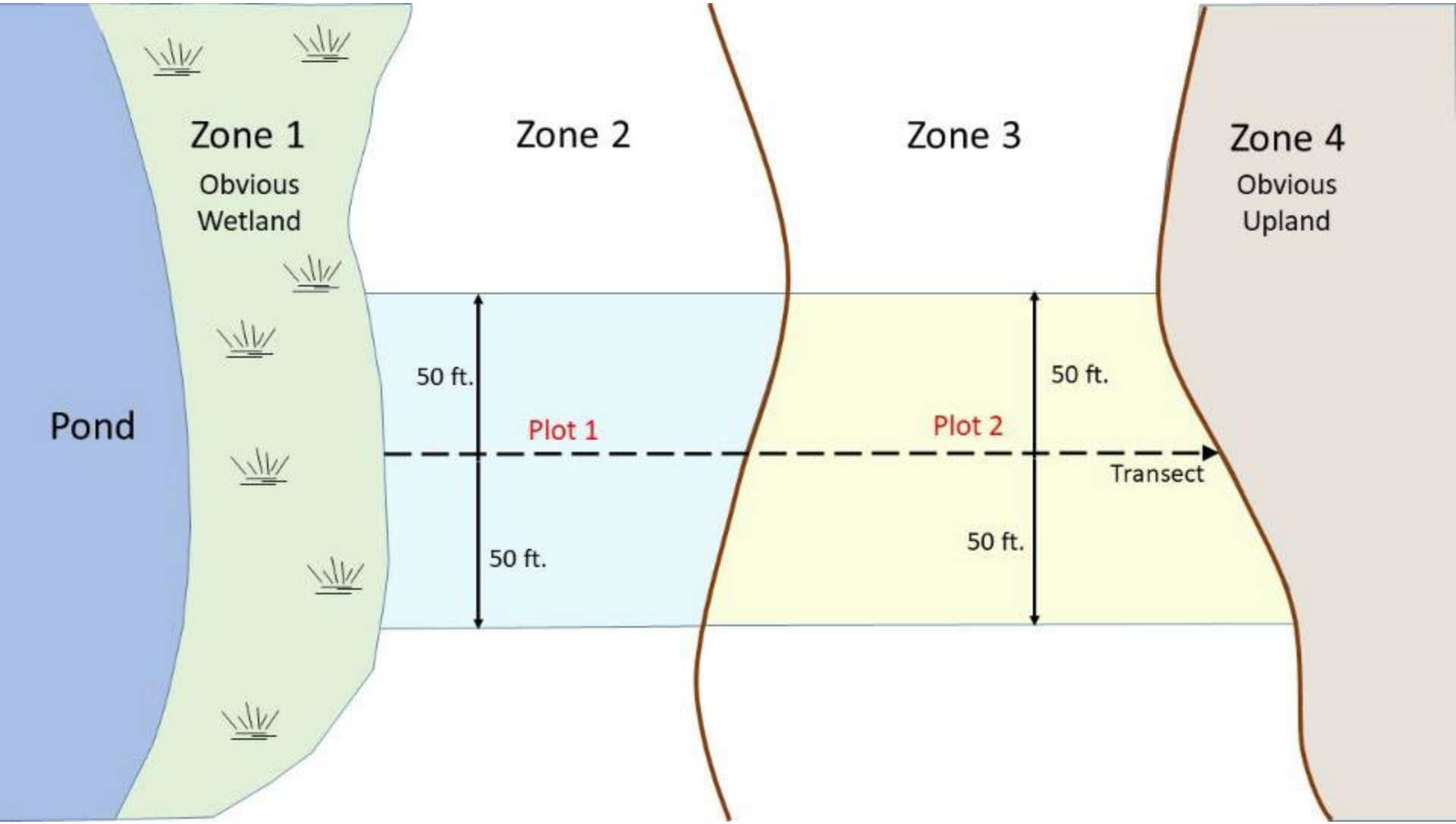
To bring the Massachusetts delineation methods closer to the federal approach, the handbook recommends use of the federal hierarchy for vegetation analysis.

When using another methodology, applicants should justify why the use of the method is appropriate for that particular delineation, and the issuing authority (conservation commission or MassDEP) must consent to its use.

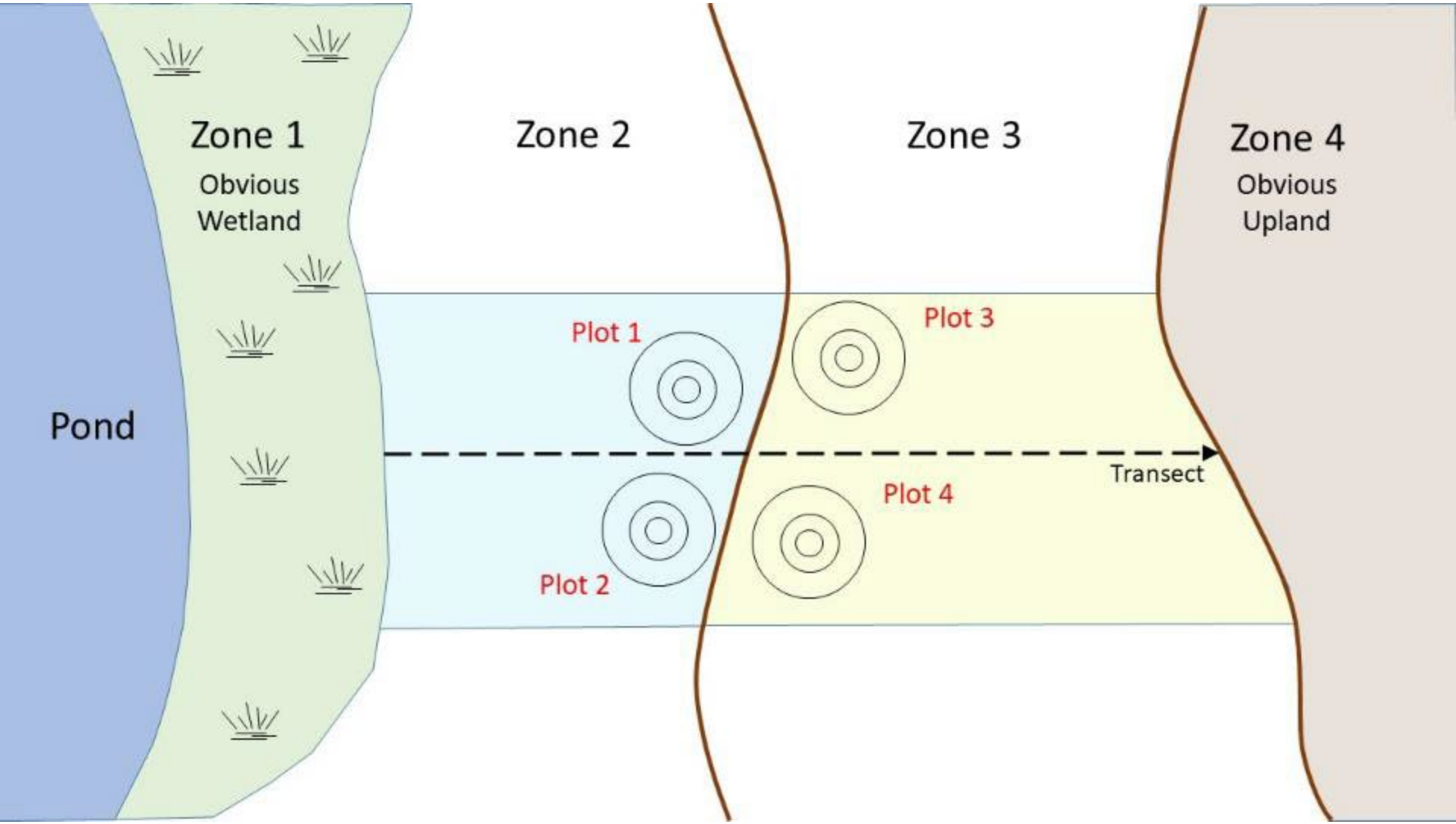
Vegetative Layers

- Herb: herbaceous plants and woody plants < 3.3’ tall
- Shrubs & Saplings: woody plants ≥ 3.3’ tall but < 3” DBH
- Trees: woody plants ≥ 3” DBH
- Woody vines

Strip Transect for Vegetation Analysis



Small Plots for Vegetation Analysis



Other Indicators of Hydrology

- Reliable Indicators of Wetlands Hydrology
- Indicators that Can be Reliable for Establishing Wetlands Hydrology with Proper Interpretation
- Indicators of the Influence of Water

Other indicators of hydrology vary in their reliability and it is difficult to proscribe what combination of indicators are sufficient to establish that wetland hydrology exists at a site. Sound judgement must be used and all indicators available at a site considered, in order to accurately determine the BVW boundary. The goal must always be the accurate interpretation of available evidence to determine the limits of wetland hydrology.

Other Indicators of Hydrology

Reliable Indicators

- Water-stained leaves
- Evidence of aquatic fauna
- Iron deposits
- Algal mats or crusts
- Oxidized rhizospheres (pore linings)
- Thin muck surfaces
- Hydrogen sulfide odor
- Morphological plant adaptations
  - Air-filled tissue (aerenchyma)
  - Polymorphic leaves
  - Floating leaves

Other Indicators of Hydrology

Indicators that can be Reliable with Proper Interpretation

- Hydrological records
- Free water in a soil test hole
- Saturated soil in the upper part
- Water marks on trees, boulders, abutments, etc.
- Moss trim lines
- Presence of reduced iron (alpha-alpha dipyridyl dye or strips)
- Morphological plant adaptations
  - Adventitious roots
  - Shallow root systems
  - Enlarged (hypertrophied) lenticels

Other Indicators of Hydrology

Indicators of the Influence of Water

- Direct observation of inundation
- Sparsely vegetated concave surfaces
- Drift lines
- Scoured areas
- Sediment deposits
- Surface soil cracking
- Drainage patterns
- Microtopographic relief
- Geographic position
  - Floodplain depressions
  - Toe of slope
  - Lowland fringing a water body