ILLINOIS SUSTAINABLE AG PARTNERSHIP

WETLAND PRACTICES: SIMILARITIES & DIFFERENCES

THE WETLANDS INITIATIVE

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THE WETLANDS INITIATIVE

The Wetlands Initiative is a nonprofit dedicated to restoring the wetland resources of the Midwest to improve water quality, increase wildlife habitat and biodiversity, and reduce flood damage.


CURSE of the
SWAMP
CREATURE
John Agar
Francine York
(Elite Entertainment)

WETLAND SIMILARITIES & DIFFERENCES

- What is a wetland?
- What functions and services do wetlands provide?
- What are the different wetland practices?

BAYOU, BILLABONG, BOG, CARR, DAMBO, DELTA, FEN, LAGOON, MANGROVE, MARSH, MIRE, MOOR, MUSKEG, POCOSIN, POTHOLE, SEEP, SLOUGH, SWAMP, VLEI, VERNAL POOL, WET MEADOW

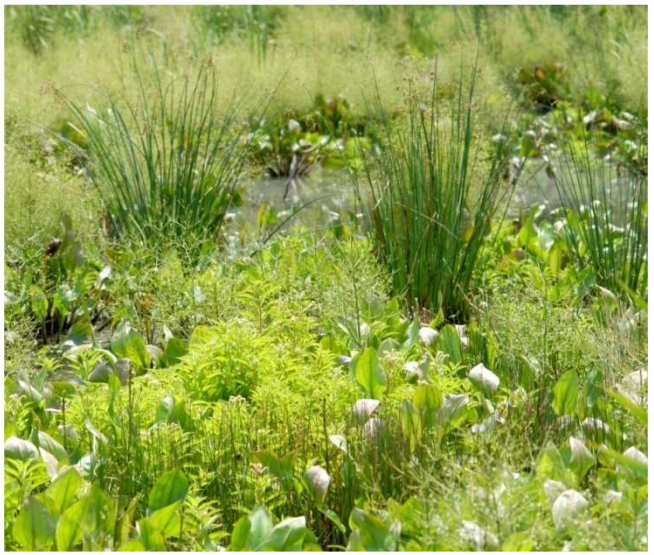
LEGAL DEFINITION OF A WETLAND

Wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (Federal Register, July 19, 1977, July 22, 1992).

3 DEFINING CHARACTERISTICS

Hydrology

Hydric Soils



Hydrophytic Plants

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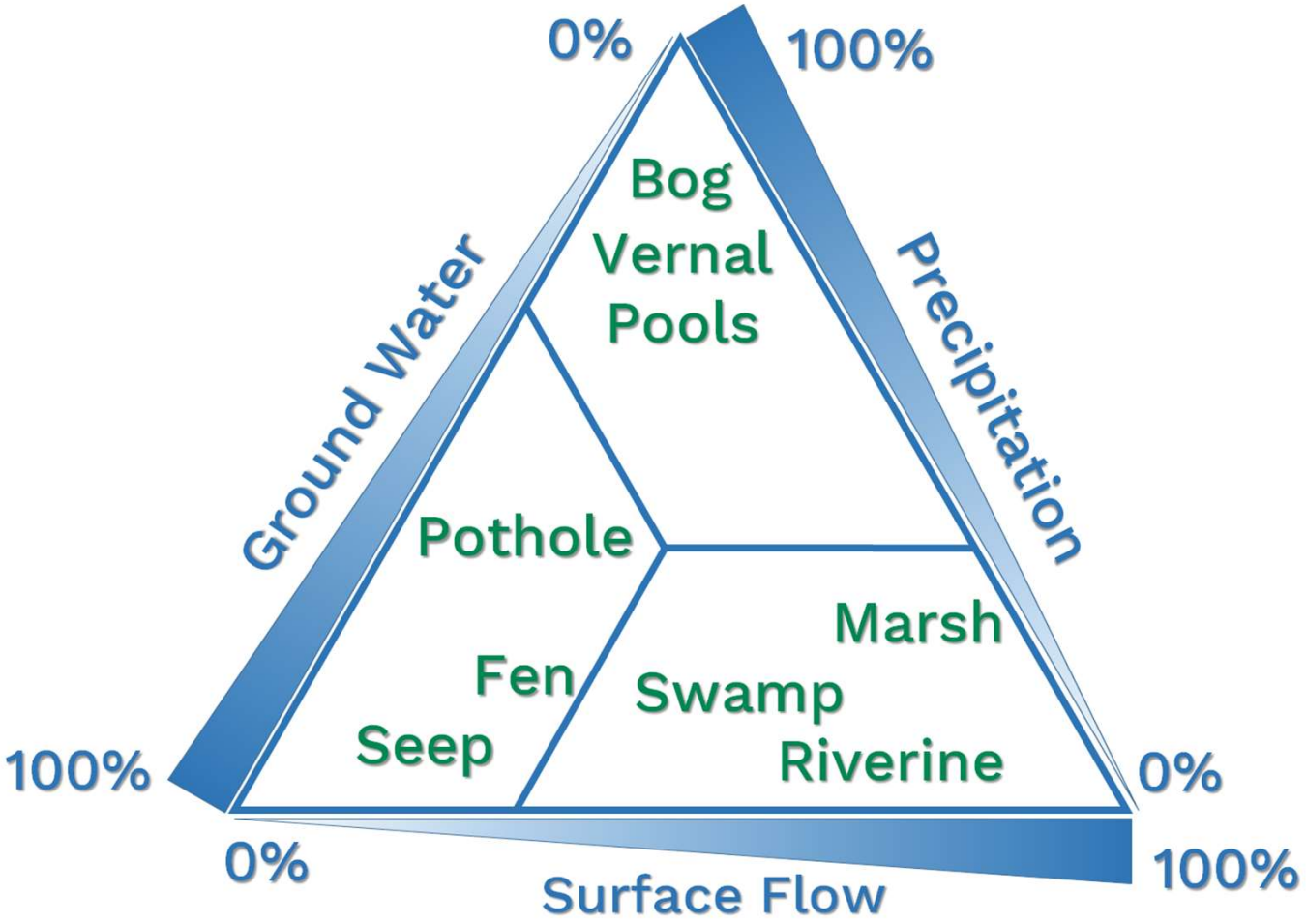
HYDROLOGY

- Where soils are always or often saturated
- In and at the edges of standing or flowing water
- Where rain and runoff collect in basins or depressions
- Where groundwater surfaces
- Where streams and rivers flood

FRESHWATER WETLAND HYDROLOGY



(derived from Brinson 1993)

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3 DEFINING CHARACTERISTICS

Hydrology

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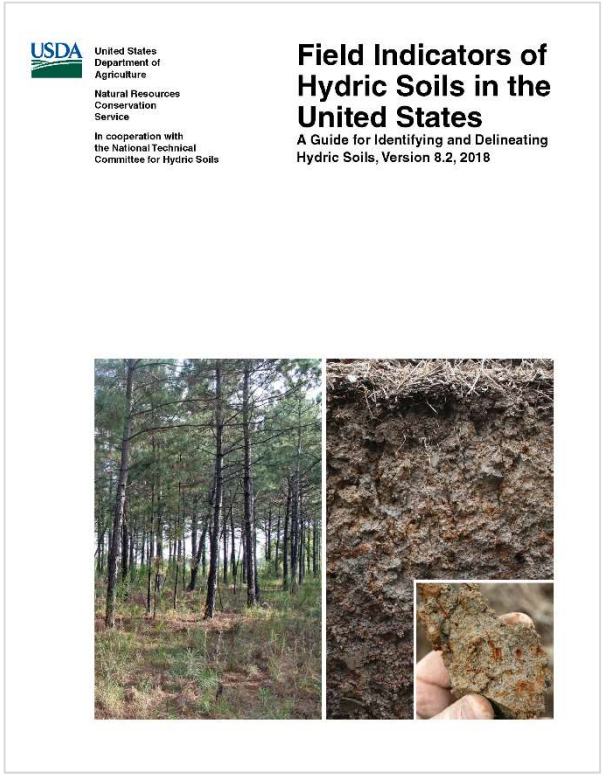
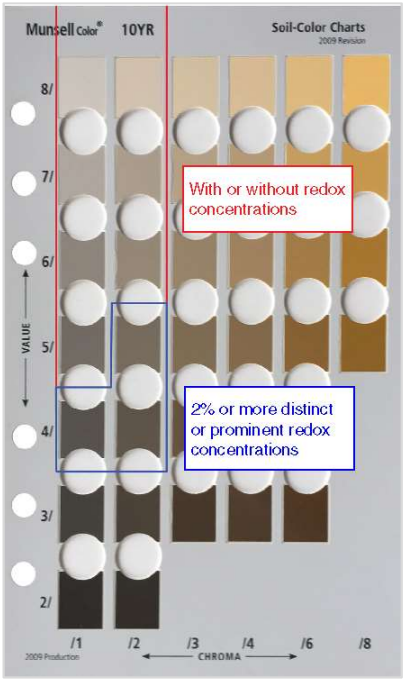
HYDRIC SOILS

- A soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions
- Anaerobic conditions lead to the formation of certain observable characteristics in the soils



- Texture, color (chroma) when moist, redox types (depletions or reduced matrix) and location (matrix or pore lining), and layers (thickness)



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HYDRIC SOILS

- Illinois is in Land Resource Region M

SOIL Sampling Point: _____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

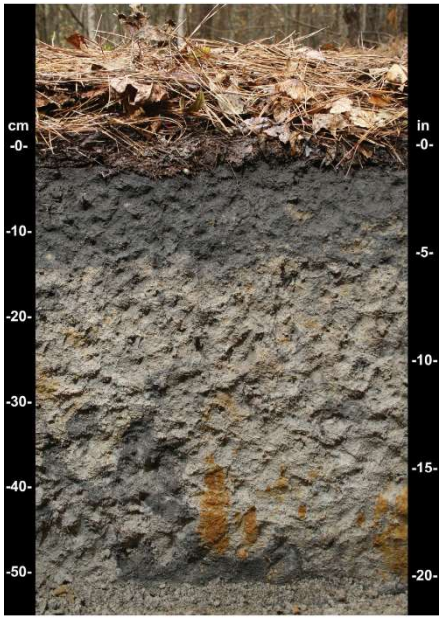
Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

(Army Corps of Engineers Midwest Wetland Determination Form Soil Section)

F2. Loamy Gleyed Matrix. A gleyed matrix that occupies 60% or more of the layer starting at a depth ≤ 30 cm (12 inches) from the surface.



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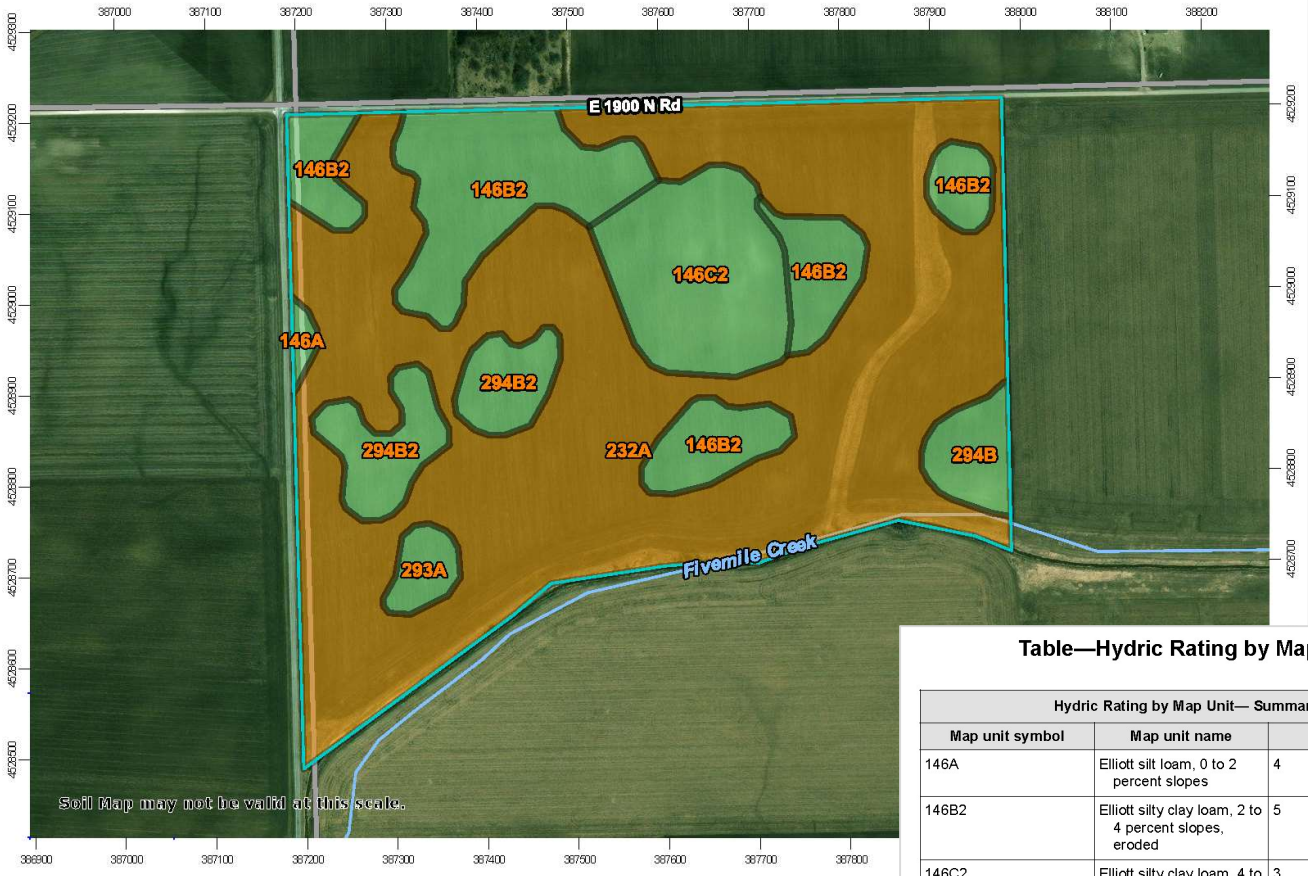
HYDRIC SOILS

Custom Soil Resource Report
Map—Hydric Rating by Map Unit



Table—Hydric Rating by Map Unit

Hydric Rating by Map Unit— Summary by Map Unit —				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
146A	Elliott silt loam, 0 to 2 percent slopes	4	0.5	0.4%
146B2	Elliott silty clay loam, 2 to 4 percent slopes, eroded	5	17.8	16.9%
146C2	Elliott silty clay loam, 4 to 6 percent slopes, eroded	3	9.5	9.0%
232A	Ashkum silty clay loam, 0 to 2 percent slopes	97	68.0	64.4%
293A	Andres silt loam, 0 to 2 percent slopes	6	1.5	1.4%
294B	Symerton silt loam, 2 to 5 percent slopes	6	2.5	2.4%
294B2	Symerton loam, 2 to 5 percent slopes, eroded	6	5.8	5.5%
Totals for Area of Interest			**105.5**	**100.0%**

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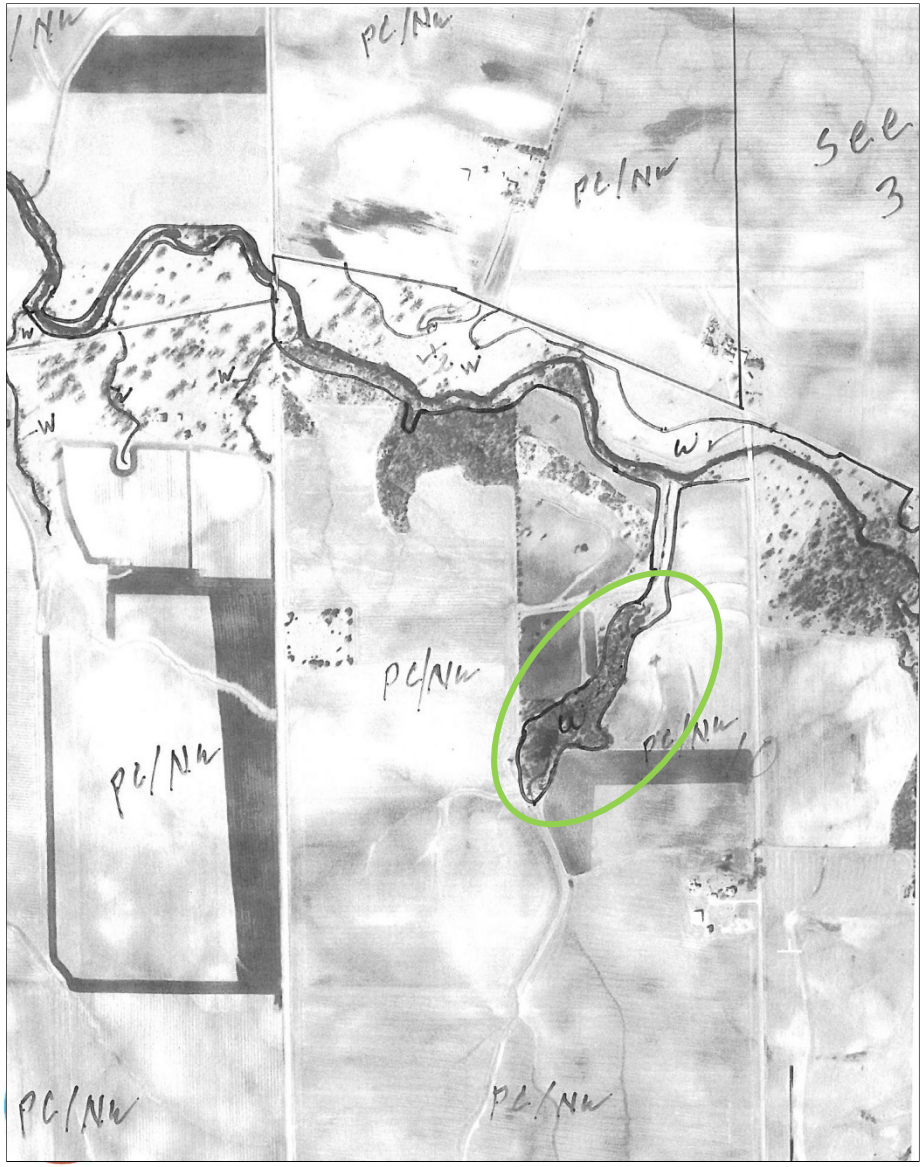
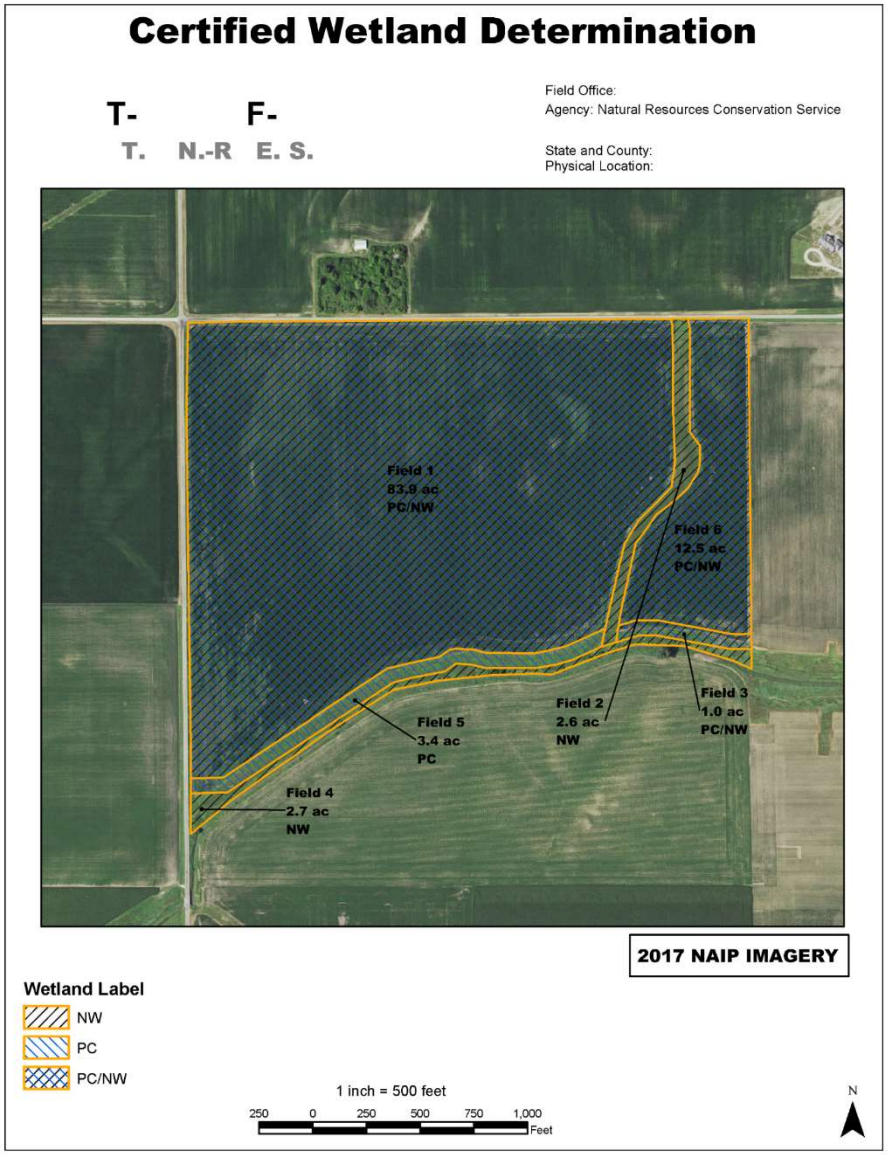
HYDRIC SOILS





3 DEFINING CHARACTERISTICS

Hydrology

Hydric Soils

Hydrophytic Plants

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HYDROPHYTIC PLANTS

- Plants with adaptations or responses that allow them to survive, grow, and reproduce with their roots in water or saturated soils for at least part of a year.

Water Lily, Cattail, Lotus, Pondweed, Spadder Dock

Sedges, Bulrushes, Cattail, Burreed, Duck Potato

Sedges, Rushes, Asters, Bulrushes, Spike Rushes, Lobelias

Sedges, Grasses, Asters, Lobelias, Coneflowers, Cup Plant

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HYDROPHYTIC PLANTS

- Adaptations to their mechanisms and structures allow them to survive in low oxygen, limited light, low nutrient conditions, and fluctuating water levels.

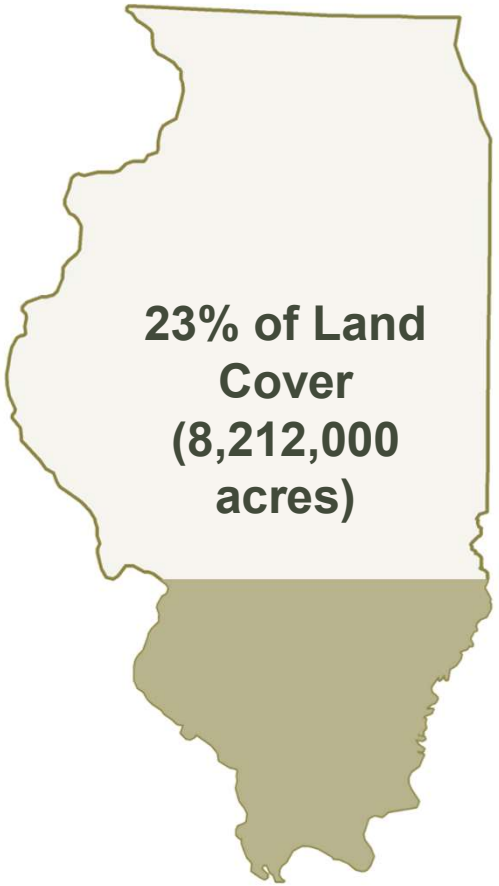
Asters, Skunk Cabbage, Monkey Flower, Sedges, Rushes, Marsh Marigold

Sugar Maple, Cottonwood, Willow, Pin and Swamp Oak

Cypress, Mangrove, Tupelo, Maple, Iris, Grasses, Ferns

WETLAND LOSS IN ILLINOIS

Pre-Settlement (1780s)



1980s

Only 6,000 acres are considered high in ecological quality.

(Images by Jim Monchak/TWI; data from Dahl, 1990)

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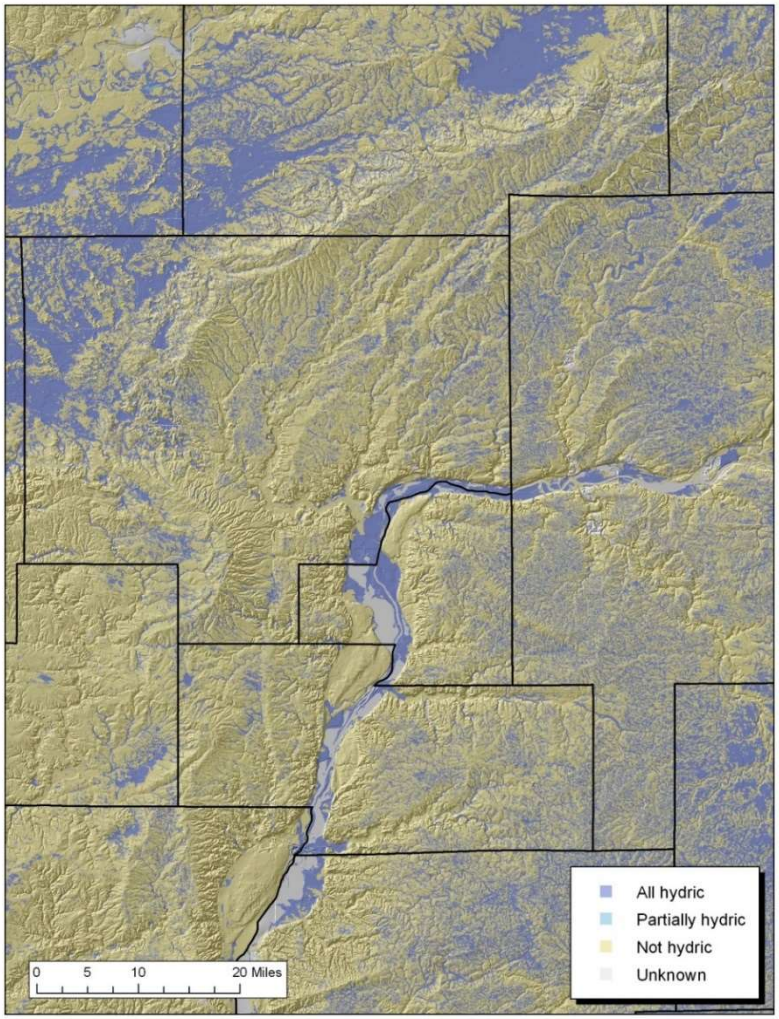
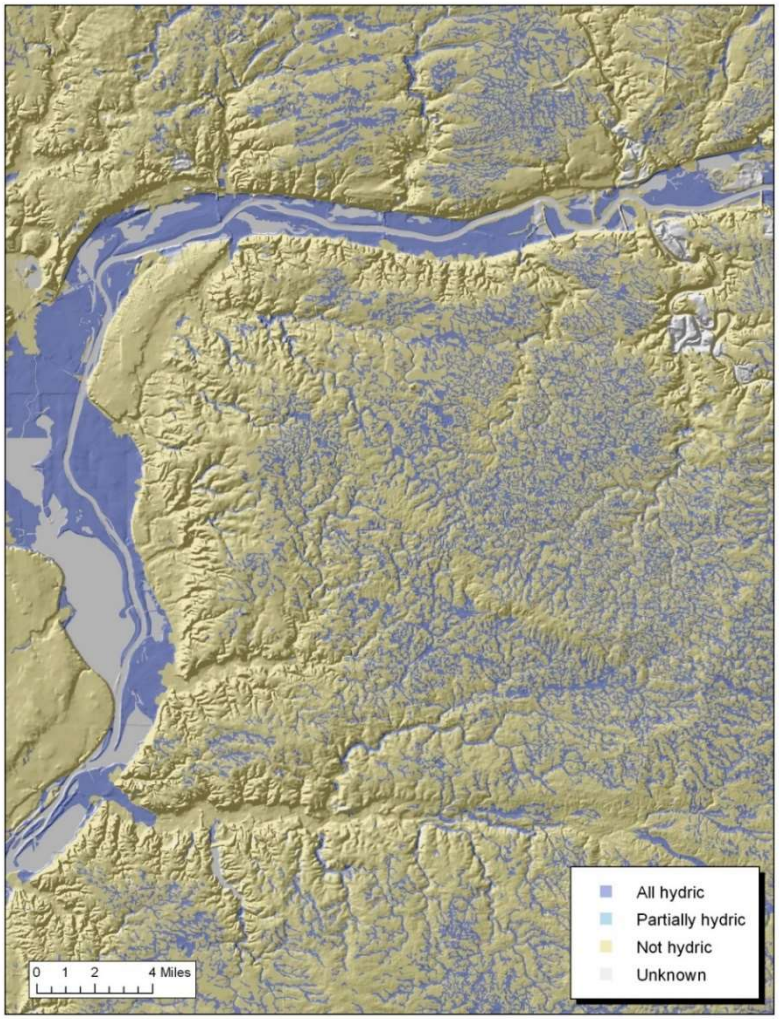
ILLINOIS PRE-SETTLEMENT WETLANDS





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(Images by Jim Monchak/TWI)

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MYTH: LAND IS BETTER DRY THAN WET

WETLAND ECOSYSTEM FUNCTIONS

Direct

- Wildlife habitat
- Recreational opportunities
- Water quality improvement
- Flood water storage
- Groundwater recharge
- Shoreline protection

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WETLAND ECOSYSTEM FUNCTIONS

Direct

- Wildlife habitat
- Recreational opportunities
- Water quality improvement
- Flood water storage
- Groundwater recharge
- Shoreline protection

Indirect

- Most productive ecosystem
- Storehouse of biodiversity

Global

- Clean water supply
- Oxygen regeneration
- Carbon storage
- Nutrient cycling

Human survival

- Raw materials
- Medicinal resources
- Fuel
- Food and fodder
- Hunting opportunities

BIODIVERSITY

U.S. wetlands support about 5,000 plants, 190 amphibian species, and 1/3 of all bird species.

WETLAND "PROTECTION"

SECTION 404 CLEAN WATER ACT (1972)

Requires individuals to obtain a permit before discharging dredged or fill material into waters of the United States, including most wetlands

SWAMPBUSTER

Provisions of the 1985 Food Security Act, which withholds certain Federal farm program benefits from farmers who convert or modify wetlands

Allows the continuation of most farming practices so long as wetlands are not converted or wetland drainage increased

WETLAND CONSERVATION COMPLIANCE

PC (Prior Converted Cropland) –

- Converted to cropland before December 23, 1985, and as of December 23,1985, was capable of being cropped and did not meet farmed wetland hydrology criteria.
- Are exempt from the Swampbuster provision of the Farm Bill.
- Can be further drained, cropped or manipulated without loss of eligibility for USDA program benefits.
- Are also exempt from wetland regulations administered by the Army Corps of Engineers and EPA (Section 404 of the Clean Water Act.

FW (Farmed Wetland) or FWP (Farmed Wetland Pasture/Hayland)

- Was manipulated and planted before December 23, 1985, but still meets inundation or saturation criteria.
- May be farmed and maintained as documented before December 23, 1985, if they are not abandoned
- Can take NO action to increase effects on the water regime beyond that which existed on such lands on or before December 23, 1985

WETLAND CONSERVATION COMPLIANCE

Wetland (W)

- An area meeting wetland criteria that was not converted after December 23, 1985.
- Include farmed wetlands and farmed wetland pasture that have been abandoned

Wetlands on farms, in order to maintain USDA benefits:

- Leave the wet areas intact and unaltered, continue farming activities around the wetland area (W), or farm the area (FW) if dry conditions exist but do not make any land manipulations (e.g., filling, drainage, clearing, etc.).
- Enroll in a USDA voluntary program that provides resources to restore and protect wetlands (Conservation Reserve Program, Environmental Quality Incentives Program, Agriculture Conservation Easement Program-Wetland Reserve Easement).
- If you wish to alter your wetland acreage
  - Mitigate any wetland losses
  - Purchase wetland credits through a mitigation bank
  - Request a minimal effect determination from NRCS
- Wetland drainage activities may be subject to provisions under the CWA

WETLAND ENHANCMENT

The augmentation of wetland functions beyond the original natural conditions on a degraded or naturally functioning wetland site.

- Enhance selected functions to conditions different than those that originally existed.
- Targets are to improve habitat for a targeted species, wildlife, or recreational purposes.
- Tend to enhance one function at the expense of others

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WETLAND RESTORATION

Restoration establishes conditions similar to the original conditions where wetlands have been changed by human activities.

- Hydric soils are present.
- The “original” hydrology and topography is reestablished.
- Target is to restore the natural hydrology, topography, native vegetation and natural processes and functions.

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20 YEARS LATER (BIODIVERSITY DESIGN TARGET)


(J. PYSZKA)


(D. GLAZIK)

WETLAND CREATION

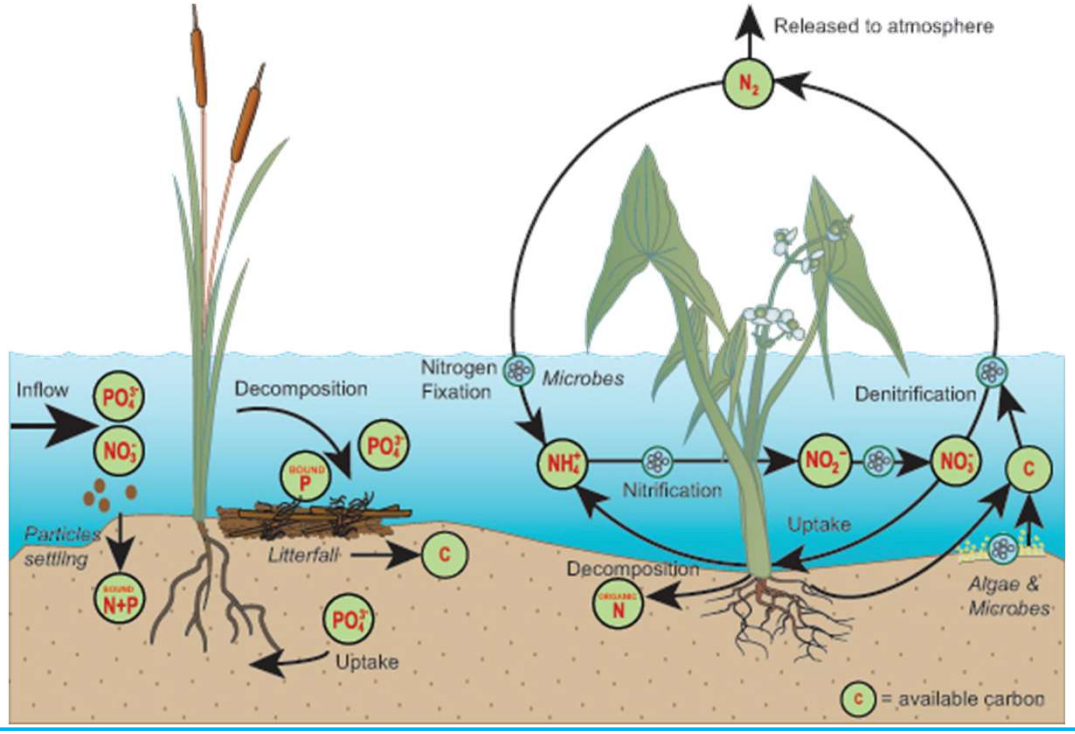
Creation establishes a wetland in a location where a wetland never historically existed.

- This practice applies to sites where no natural wetland occurred historically, and which contain soils that are not hydric. This means creating wetland characteristics on land that was historically upland.
- To establish wetland hydrology, vegetation, and wildlife habitat functions on soils capable of supporting those functions.
- More difficult (and expensive) than wetland restoration as it can be hard to establish and sustain wetland conditions.
- Hydric soils and biota that are critical to many functions take a long-time to form.

CONSTRUCTED WETLAND

A constructed wetland is a wetland created specifically for the purpose of treating water (aka a treatment wetland). It is an artificial or man-made ecosystem.

- Engineered systems designed to utilize and “optimize” specific wetland characteristics and functions that improve water quality.
- It can be built in an area where a wetland never historically existed (created wetland) or previously existed.



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CONSTRUCTED (TREATMENT) WETLAND

- Municipal wastewater treatment
  - Secondary treatment for small communities
  - Add-ons to older or overloaded conventional secondary plants
  - Add-ons to lagoons
- Domestic wastewater treatment
- Urban stormwater
- Agriculture
  - Animal waste: dairy manure and milkhouse wash, runoff from concentrated cattle feeding operations, swine manure, poultry manure, and catfish pond water
  - Field runoff
- Industrial wastewater treatment
  - Food processing (potato, wine, olive oil, sugar, alcohol, and meat)
  - Metal minewater and tailing pile leachates
  - Pulp and paper mills
  - Landfill leachate
  - Petroleum refineries
  - Groundwater remediation

CONSTRUCTED (TREATMENT) WETLAND

By Tim Williamsen (Own work) [CC BY-SA 3.0 (http://creativecommons.org/licenses/by-sa/3.0)], via Wikimedia Commons

Petaluma Wetlands Park and Ellis Creek Water Recycling (CA)

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CONSTRUCTED (TREATMENT) WETLAND

By U.S. Geological Survey (http://sofia.usgs.gov/publications/ofr/2007-1374/) [Public domain], via Wikimedia Commons

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Stormwater (sugar cane) Treatment Areas in the northern Everglades

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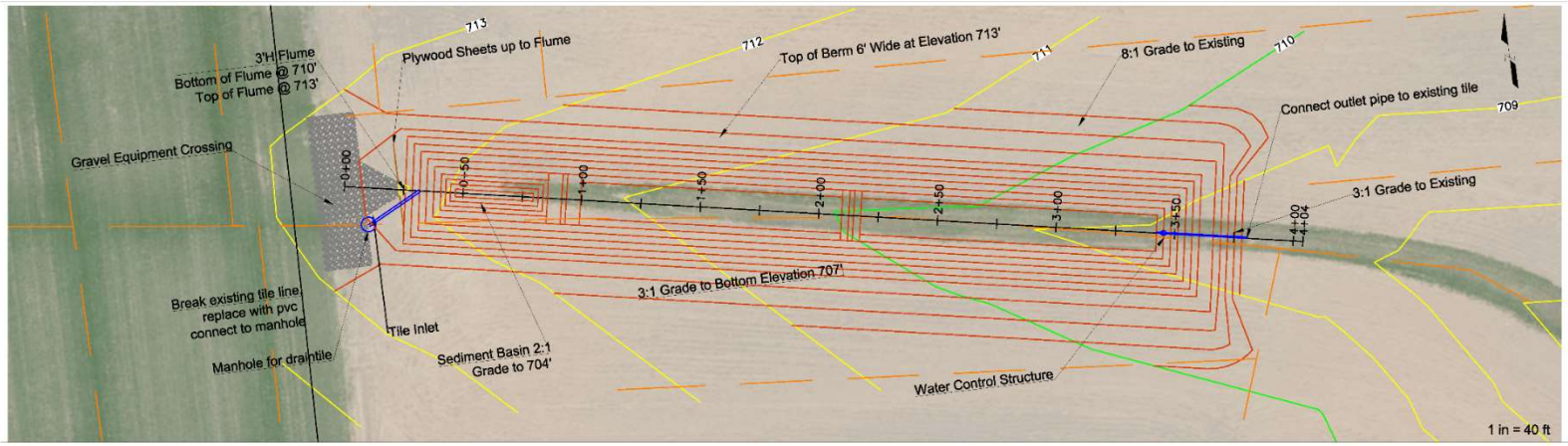
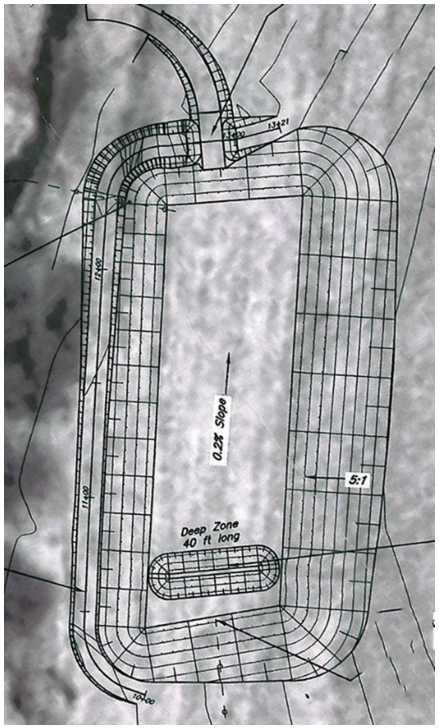
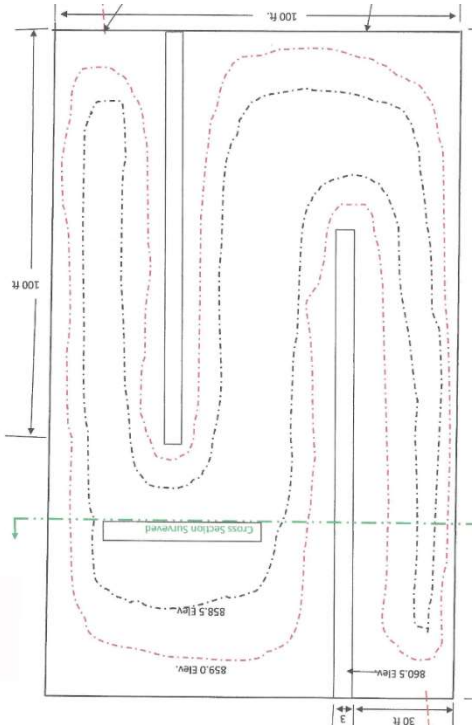
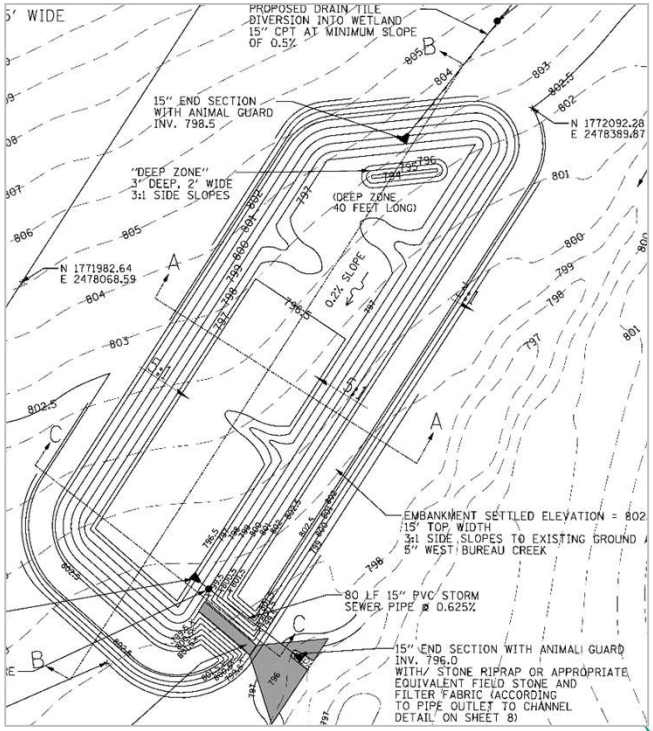
CONSTRUCTED (TREATMENT) WETLAND

CONSTRUCTED WETLANDS FOR CROPLAND TILE DRAINAGE TREATMENT









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Many restored wetlands are “constructed” to develop needed hydrologic connections/retention and topography for habitat targets, but they are not constructed wetlands!

Constructed Wetland Key Messages

- Constructed wetland are a “newer” technology to improve tile drainage systems in Illinois
- One of the most cost-effective nutrient removal practices available
- Can be installed on unproductive land thereby improving profitability
- Once established, it is a self-sustaining system
- Does not require changes in crop production practices or systems
- Can be placed out of public view
- Can test water at inlet to understand impacts of crop production practices in the tile-drainage area
- Can be designed to include buffers and other structures to reduce erosion from overland water flow
- Reduces nutrient flowing from cropland into streams/ditches thereby protecting stream health
- Requires up-front installation costs, it is a long-term, effective and efficient way to significantly reduces negative impact of nutrients on your local environment