# Maintenance of stormwater features

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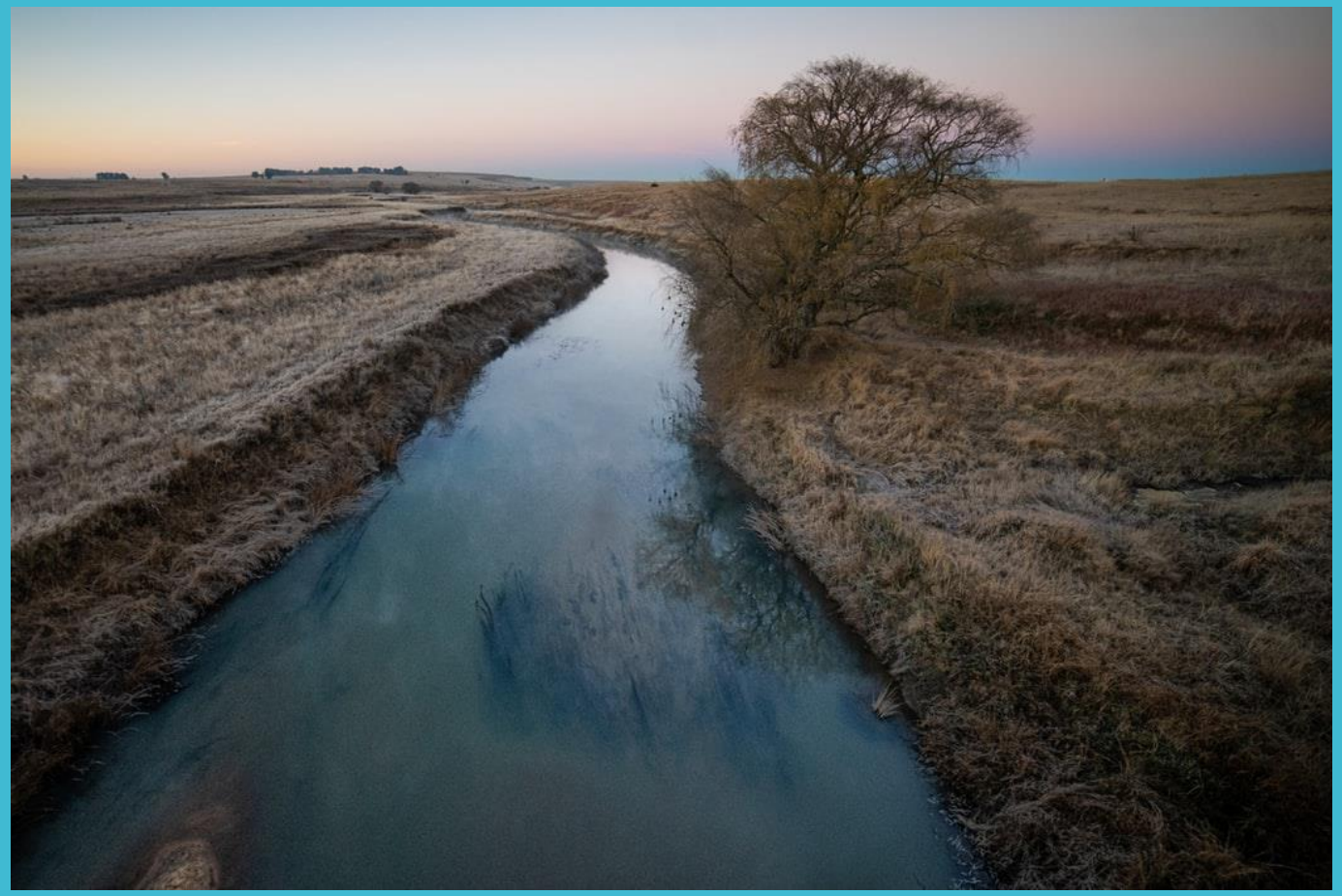


Photo: Tiaan van Zyl

photo Ivonne Woelki

# Stormwater features and wetlands

- Wetlands present within man-made stormwater detention basins or conveyance features
- Stormwater detention basins or conveyance features present within wetlands

# What is a wetland?

- Presence of water at or near the surface for at least 14 consecutive days during the growing season on a reoccurring basis
- Need soils, hydrology, vegetation

Photo by Tyler Butler

# What is a wetland?

- Soils – Need at least one indicator
- Hydrology – Need one primary indicator or two secondary indicators
- Vegetation – Fac-neutral test

# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Braun Road Parcel City/County: Racine Sampling Date: 12/9/19

Applicant/Owner: Fiduciary Real Estate Development, Inc. State: WI Sampling Point: W2-1w

Investigator(s): Matt Knickelbine, Brian Lennie Section, Township, Range: S35, T3N, R22E

Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0-2 Lat: N/A Long: N/A Datum: N/A

Soil Map Unit Name: AtA: Ashkum silty clay loam, 0 to 2 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No ____ | **Is the Sampled Area within a Wetland?** Yes X No ____ |
| Hydric Soil Present? | Yes X | No ____ | |
| Wetland Hydrology Present? | Yes X | No ____ | |

Remarks:
The sample plot is located in a seasonally flooded basin. WETS analysis determined that the antecedent precipitation conditions were normal.

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | | =Total Cover | |

| Sapling/Shrub Stratum (Plot size: 15) | | | |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | | =Total Cover | |

| Herb Stratum (Plot size: 5) | | | |
|---|---|---|---|
| 1. *Setaria pumila* | 70 | Yes | FAC |
| 2. *Echinochloa crus-galli* | 10 | No | FACW |
| 3. *Abutilon theophrasti* | 10 | No | FACU |
| 4. *Cyperus esculentus* | 5 | No | FACW |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| | 95 | =Total Cover | |

| Woody Vine Stratum (Plot size: 30) | | | |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 15 | x 2 = | 30 |
| FAC species | 70 | x 3 = | 210 |
| FACU species | 10 | x 4 = | 40 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 95 (A) | | 280 (B) |
| Prevalence Index = B/A = | | | 2.95 |

**Hydrophytic Vegetation Indicators:**

____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: W2-1w

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

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-30 | 10YR 2/1 | 100 | | | | | Loamy/Clayey | Clay loam |

[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)
____ Dark Surface (S7)
____ 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)
____ Iron-Manganese Masses (F12)
____ Red Parent Material (F21)
____ Very Shallow Dark Surface (F22)
X Other (Explain in Remarks)

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

**Restrictive Layer (if observed):**

Type: N/A
Depth (inches): ____

**Hydric Soil Present?** Yes X No ____

Remarks:
This data form is revised from Midwest Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx) Cross referenced with Version 8.2.
The soil was problematic because we could not get deep enough to tell for certain if it meets the A12 indicator. Based on the presence of wetland hydrology, hydrophytic vegetation, and professional opinion, soil is considered to be hydric.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

____ Surface Water (A1)
____ High Water Table (A2)
____ Saturation (A3)
____ Water Marks (B1)
____ Sediment Deposits (B2)
____ Drift Deposits (B3)
____ Algal Mat or Crust (B4)
____ Iron Deposits (B5)
____ Inundation Visible on Aerial Imagery (B7)
____ Sparsely Vegetated Concave Surface (B8)
____ Water-Stained Leaves (B9)
____ Aquatic Fauna (B13)
____ True Aquatic Plants (B14)
____ Hydrogen Sulfide Odor (C1)
____ Oxidized Rhizospheres on Living Roots (C3)
____ Presence of Reduced Iron (C4)
____ Recent Iron Reduction in Tilled Soils (C6)
____ Thin Muck Surface (C7)
____ Gauge or Well Data (D9)
____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

____ Surface Soil Cracks (B6)
____ Drainage Patterns (B10)
____ Dry-Season Water Table (C2)
____ Crayfish Burrows (C8)
X Saturation Visible on Aerial Imagery (C9)
____ Stunted or Stressed Plants (D1)
X Geomorphic Position (D2)
X FAC-Neutral Test (D5)

**Field Observations:**

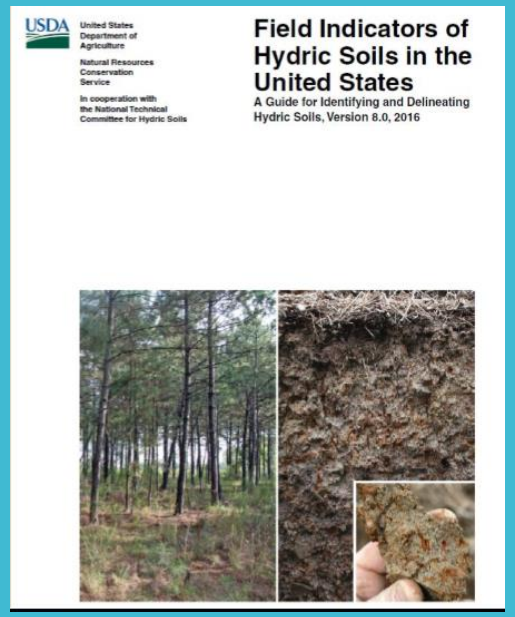
| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No X | Depth (inches): ____ |
| Water Table Present? | Yes ____ | No X | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes ____ | No X | Depth (inches): ____ |

**Wetland Hydrology Present?** Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Surface water present from recent rain, however, soil was dry beneath and it was determined that it does not meet the A1 Indicator. The presence of

# How are wetlands delineated?


USDA United States Department of Agriculture
Natural Resources Conservation Service
In cooperation with the National Technical Committee for Hydric Soils

Field Indicators of Hydric Soils in the United States
A Guide for Identifying and Delineating Hydric Soils, Version 8.0, 2016

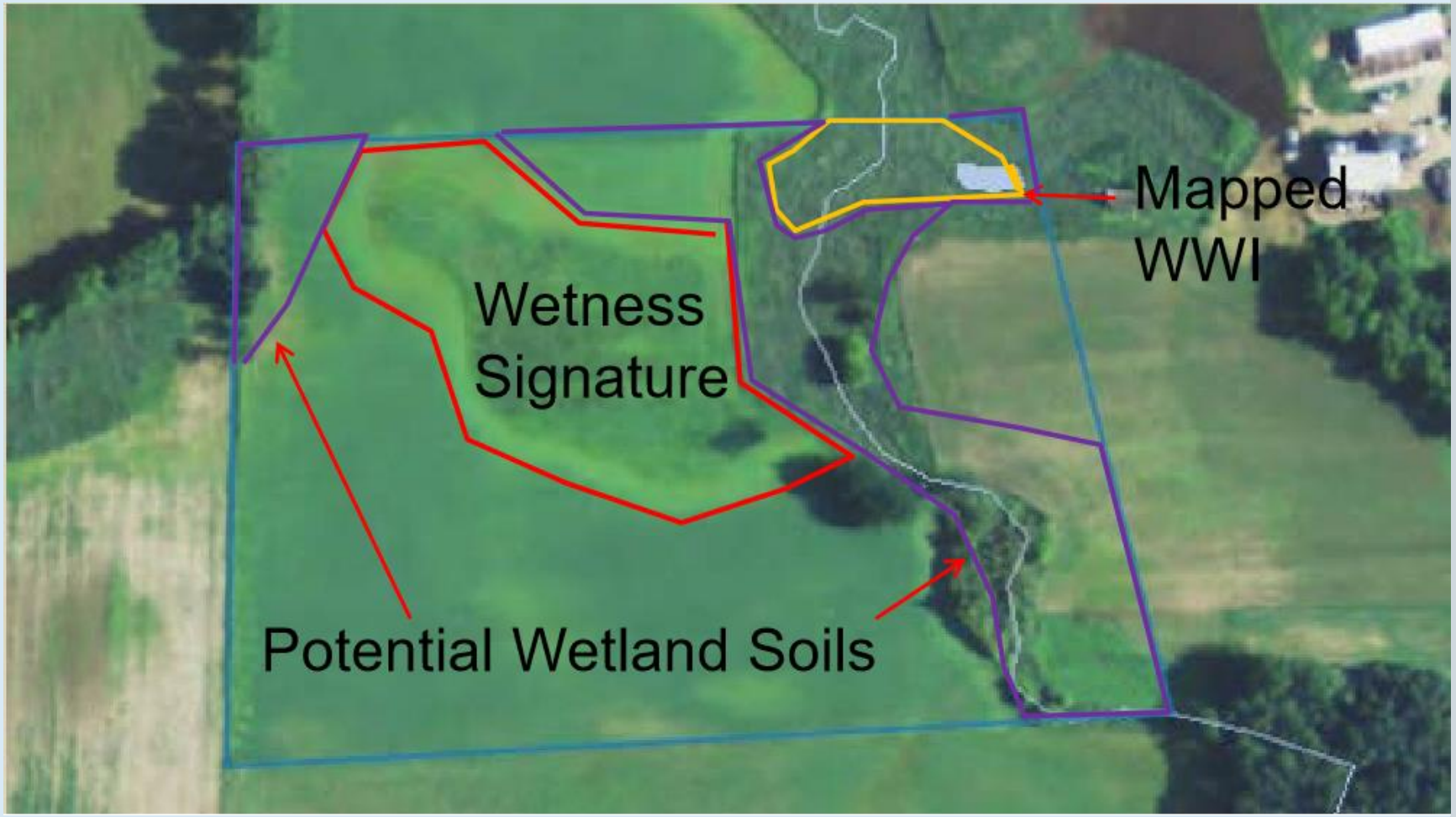
- USACOE 87 Manual
  - regional supplements
  - topography
- Wetland delineators, NRCS, WDNR staff

AMENDED PROJECT AREA
WETLANDS TO BE CONSIDERED FOR EXEMPTION DETERMINATION
W-1
0.131 Acres
SP-01
SP-02
SP-03
W-3
0.296 Acres
W-2
0.335 Acres
SP-06
SP-05
SP-08
SP-07
SP-04
W-5
0.043 Acres
SP-09
SP-11
SP-10

# Wetlands on the surface water data viewer

Credit Tom Nedland

# Wetlands on the surface water data viewer

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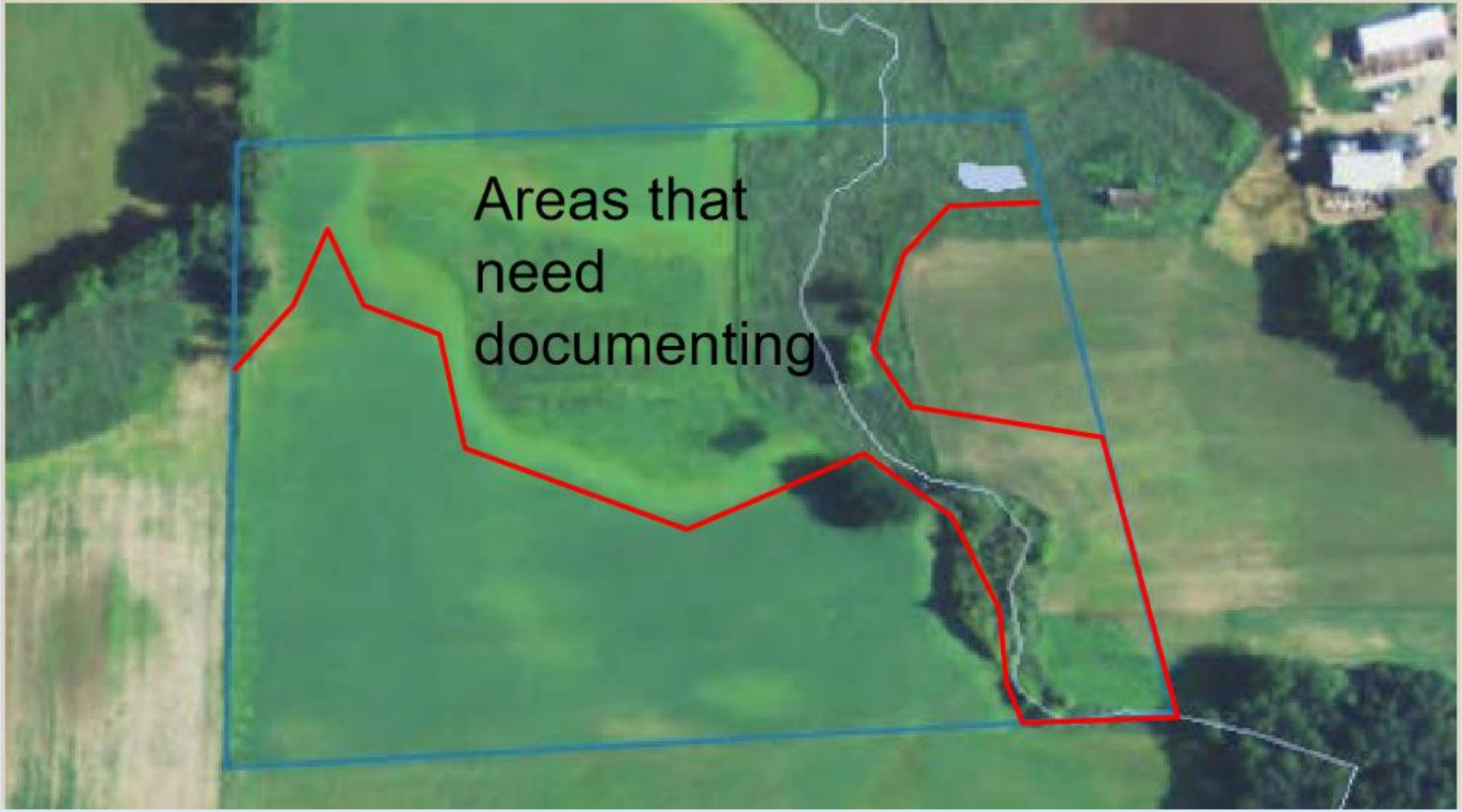
# Wetlands on the surface water data viewer




Credit Tom Nedland

# Are there wetlands in the project area?

- **SWDV: Check mapped WWI wetlands and Wetland Indicator Soils layer**
  - If contains orange mapped wetlands, likely need delineation if impact anticipated
  - If contains purple indicator area, talk to Wetland WMS
- **WDNR Wetland ID staff, Wetland WMS**

# Are there wetlands in the project area?

- **Non-assured delineators**
  - DNR confirmation needed
  - $300/20 acres
- **Assured wetland delineator**
  - No DNR confirmation needed
  - Passed DNR's assured delineation test
  - Minimum 5 years experience
  - https://dnr.wi.gov/topic/wetlands/assurance.html

# Functional Values of Wetlands

- Sediment/nutrient detention
- Storm/floodwater storage
- Groundwater processes
- Shoreline protection
- Fish/wildlife
- Floristic integrity
- Recreation, aesthetics

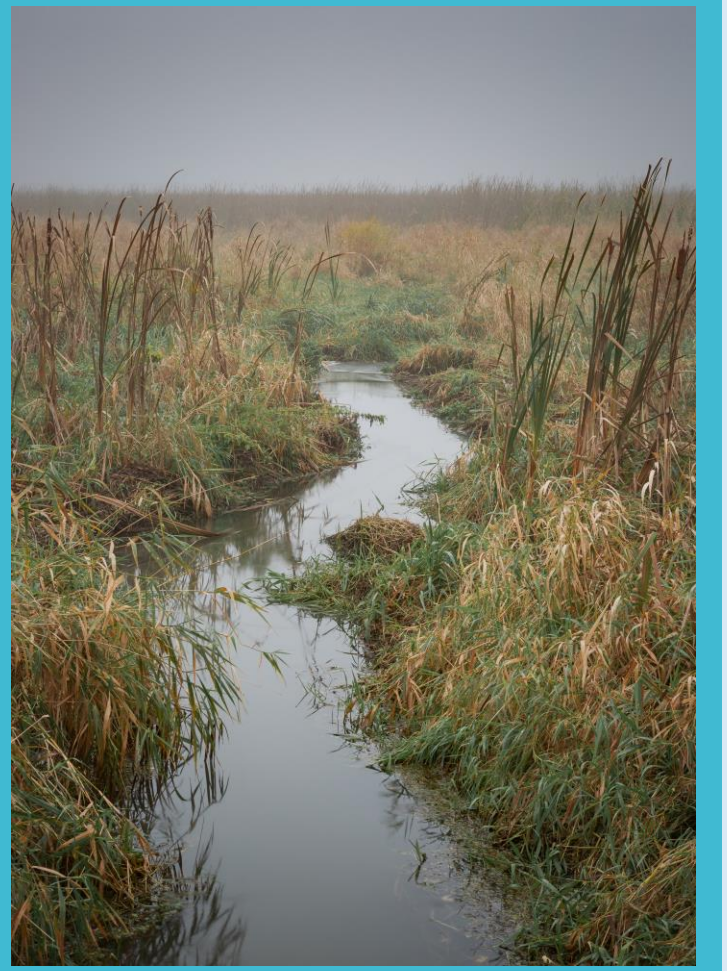


photo by Dave Iqo

# What rules regulate wetlands?

- **NR 103: Water Quality Standards for Wetlands**
- https://docs.legis.wisconsin.gov/code/admin_code/nr/100/103

- **NR 281.36: Permits for Discharges in Wetlands; Mitigation**
- https://docs.legis.wisconsin.gov/statutes/statutes/281/III/36

- **NR 353: Wetland Conservation Activities**
- https://docs.legis.wisconsin.gov/code/admin_code/nr/300/353

# Regulatory authority over wetlands

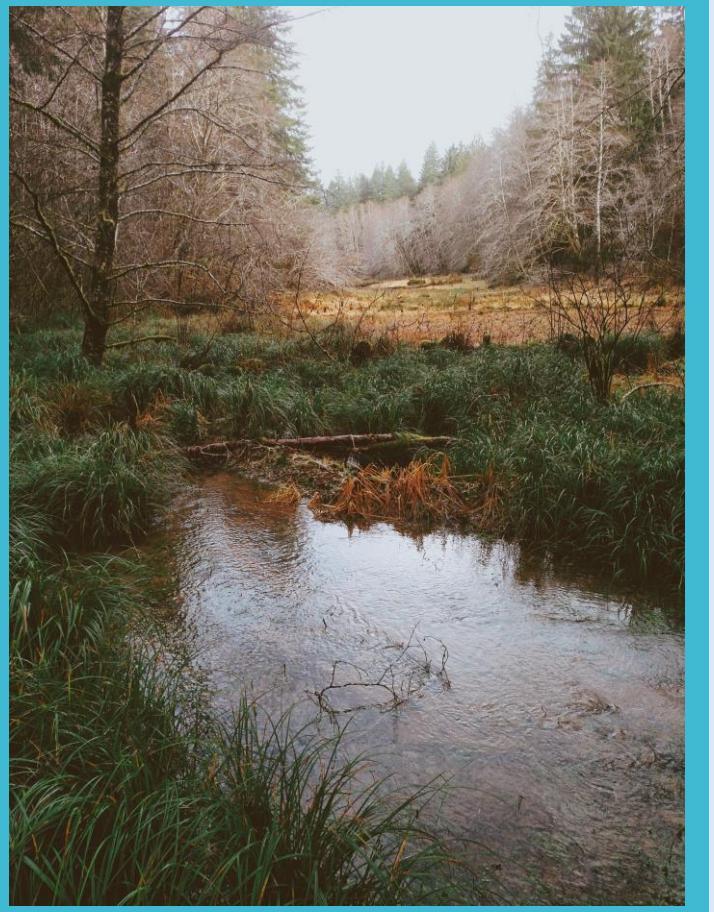
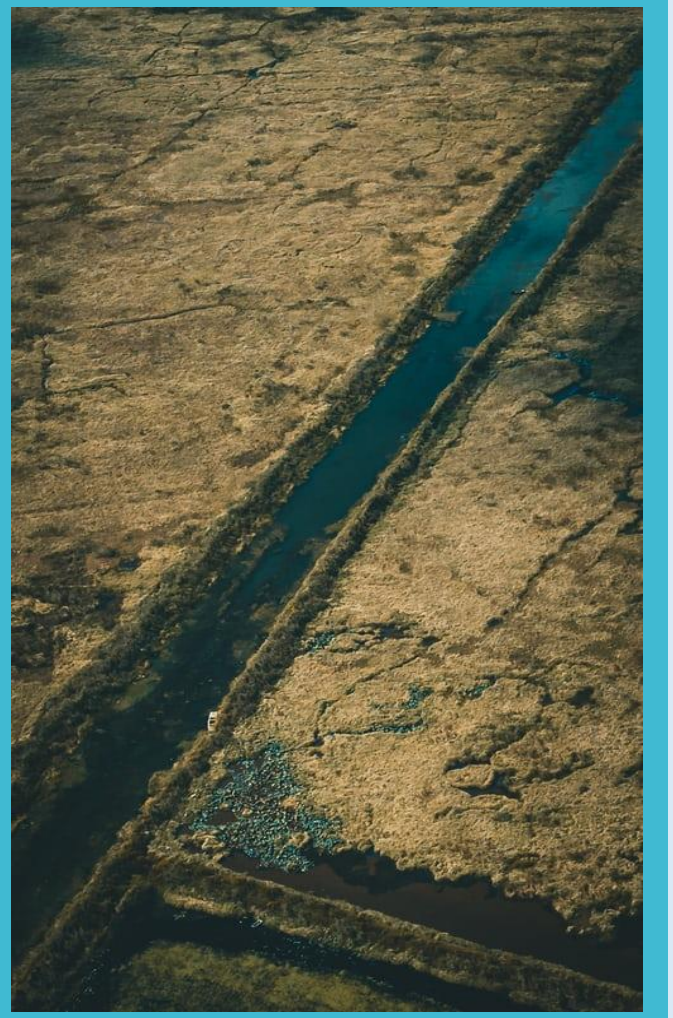


Photo by Eric Muhr

- DNR: NR 281.36 (3b)(b)
- No person may discharge dredged material or fill material into a wetland unless the discharge is authorized by a wetland general permit or individual permit issued by the department under this section or the discharge is exempt under sub. (4), (4m) (a), (4n), or (4r).
- NRCS "no wetland" or "prior converted" labels don't apply to DNR permitting.



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# Exemptions

- **281.36(4)** EXEMPTIONS; CERTAIN ACTIVITIES. Except as provided in sub. (5), the permitting requirement under sub. (3b) does not apply to any discharge that is the result of any of the following activities:
- **(b)** Maintenance, emergency repair, or reconstruction of damaged parts of structures that are in use in a wetland.
- **(d)** Maintenance of drainage ditches.
- **(f)** Maintenance, operation, or abandonment of a sedimentation or stormwater detention basin and associated conveyance features that were not originally constructed in a wetland.

- WDNR is able to provide documentation confirming exemption eligibility for peace of mind.

photo Philippe Leone

# Drainage district activity exemptions

- 281.36(4r)(a)**(a)** The permitting requirement under sub. (3b) does not apply to any discharge that is the result of activity undertaken by a drainage district to maintain drainage district drains in accordance with plans and specifications approved by DATCP
- https://datcpgis.wi.gov/maps/?viewer=dd

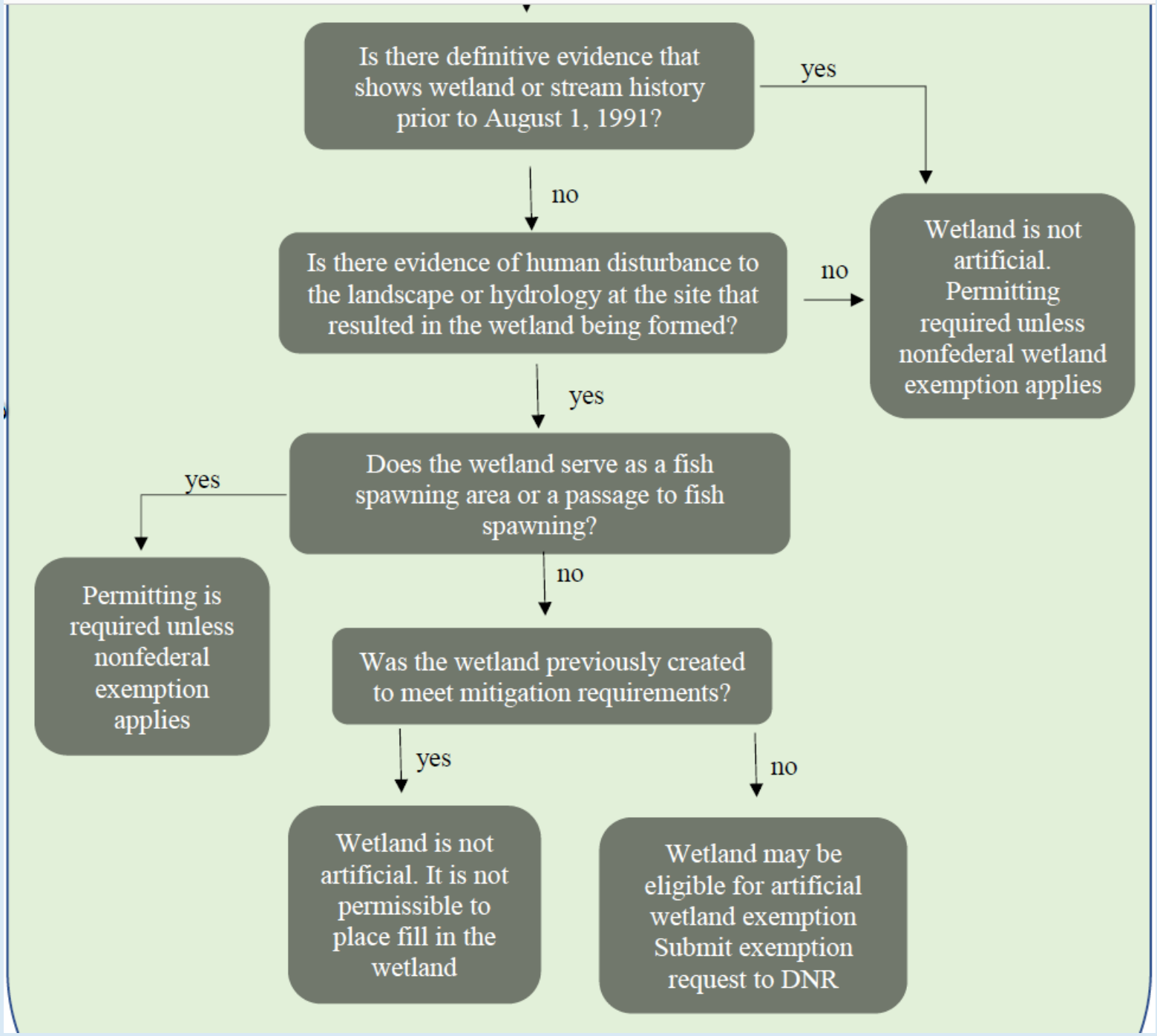
# Act 183 Wetland Exemptions

## Artificial wetlands

- Per s. 281.36(4n), Wis. Stats., defined as resulting from human modification to the landscape/hydrology, with no definitive evidence of wetland/stream history prior to August 1, 1991
- Does not include:
  - Wetlands used for fish spawning or passage to spawning
  - Wetlands created to satisfy mitigation requirements
  - Wetlands providing significant flood/water quality protection for adjacent/downstream properties/waterbodies
  - No acreage caps or mitigation requirements

Credit Ryan Pappas

# Artificial wetland exemption



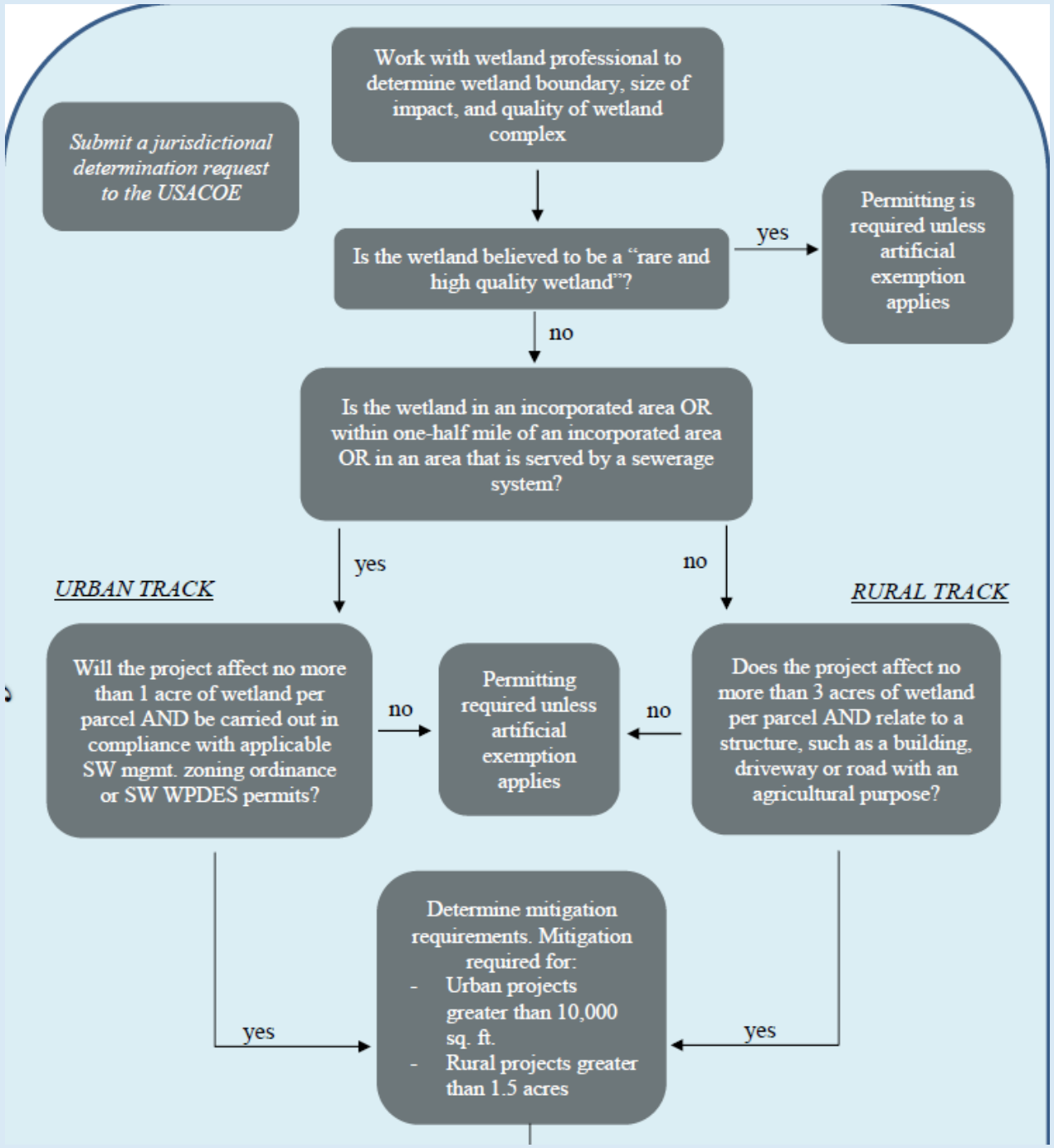
# Act 183 Wetland Exemptions

## Nonfederal wetlands

- Defined as a wetland that is not federally jurisdictional
  - Need Approved Jurisdictional Determination (AJD) from U.S. Army Corps of Engineers
  - Does not include rare and high quality wetlands as listed in s. 281.36(4n), Wis. Stats (11 types)
- Split into urban and rural tracts
  - Urban parcels have 1 acre cap, required to mitigate for impacts > 10,000 ft2, document compliance with stormwater ordinances
  - Rural parcels have 3 acre cap, required to mitigate for impacts > 1.5 acres, document compliance with stormwater ordinances, must be for an agricultural structure

Credit Ryan Pappas

# Non-federal wetland exemption



# Rare and High Quality Wetlands

- Wetland that is directly adjacent or contiguous to a Class 1 or 2 trout stream OR that consists of 75% or more of any of the following wetland types.

- a. Alder thicket
- b. Calcareous fen
- c. Coniferous swamp
- d. Coniferous bog
- e. Floodplain forest
- f. Hardwood swamp
- g. Interdunal wetland
- h. Open bog
- i. Ridge and swale complex
- j. Deep marsh
- k. Sedge meadow

# Different types of wetlands

| Ch. 281.36 (4n)(a)(3) List Type | | Eggers and Reed (2015) [2] | NHI Natural Community Type[1] |
|---|---|---|---|
| a. | Alder thicket | Alder thicket | Alder thicket |
| b. | Calcareous fen | Calcareous fen | Calcareous fen |
| c. | Coniferous swamp | Coniferous swamp | Northern wet-mesic forest |
| | | | Southern tamarack swamp |
| | | | White pine-red maple swamp |
| d. | Coniferous bog | Coniferous Bog | Black spruce swamp |
| | | | Northern tamarack swamp |
| e. | Floodplain forest | Floodplain forest | Floodplain forest |
| f. | Hardwood swamp | Hardwood swamp (vernal pool subtype) | Ephemeral pond |
| | | Hardwood swamp | Forested seep |
| | | | Hardwood swamp |
| | | | Southern hardwood swamp |
| g. | Interdunal wetland | N/A | Interdunal wetland |
| h. | Open bog | Open bog | Bog relict |
| | | | Boreal rich fen |
| | | | Central poor fen |
| | | | Great Lakes shore fen |
| | | | Muskeg |
| | | | Open bog |
| | | | Patterned peatland |
| | | | Poor fen |
| i. | Ridge and Swale complex[3] | N/A | Great Lakes ridge and swale |
| j. | Deep marsh | Deep marsh | Coastal plain marsh |
| | | | Emergent marsh |
| | | | Wild rice marsh |
| k. | Sedge meadow | Sedge meadow | Moist sandy meadow |
| | | | Northern sedge meadow |
| | | | Southern sedge meadow |
| N/A | | Shrub-carr | Shrub-carr |

# Different types of wetlands

| | | |
|---|---|---|
| N/A | Shallow, open water communities | American lotus marsh |
| | | Floating-leaved marsh |
| | | Oligotrophic marsh |
| | | Submergent marsh |
| N/A | Wet to wet-mesic prairie | Wet prairie |
| | | Wet-mesic prairie |
| **Ch. 281.36 (4n)(a)(3) List Type** | **Eggers and Reed (2015)** [2] | **Ruderal Community Type**[1] |
| N/A | Deep marsh | Ruderal marsh |
| N/A | Fresh (wet) meadow (disturbed subtype) OR Seasonally flooded basin | Ruderal wet meadow |
| N/A | Hardwood swamp | Ruderal flooded and swamp forest |
| N/A | Shrub-carr | Ruderal shrub swamp |

Photo by David Clode

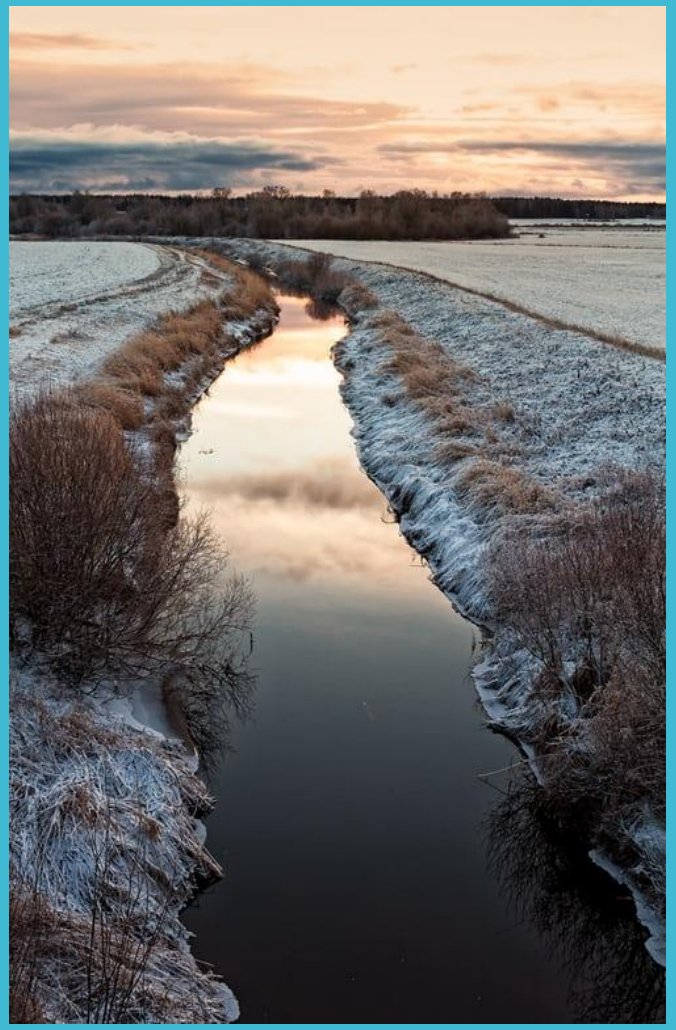
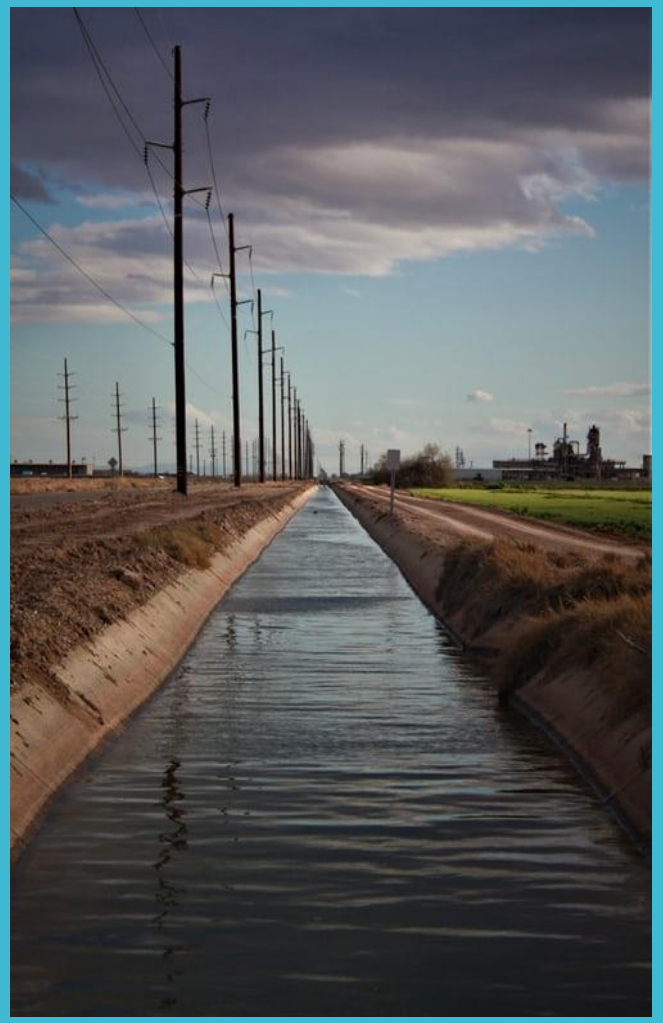


Photo Jukka Heinovirta

# New stormwater features

- General permit eligibility criteria does not allow the placement of stormwater features within wetland boundaries (detention basins, conveyance swales, etc.)
- If occurring with IP, may be USACE jurisdiction as well



phota Jack Catalano

# Existing stormwater features located within wetlands

- Need a permit (historic or individual permit if obtained now)
- After-the-fact permitting in these situations may be advantageous in that it allows the feature to be maintained in perpetuity

# Stormwater detention basins

# Stormwater conveyance features

# Wetland Permitting

- Identify wetlands on property
- Plan development to avoid wetlands if possible
- Apply for permits for wetland fill
- GP or IP
- Review of Permits

# Resources

- Wisconsin Wetland Inventory
  - https://dnrmaps.wi.gov/H5/?Viewer=SWDV
- NRCS web soil survey
  - https://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/survey/
- DNR Wetland Exemption Page
  - https://dnr.wi.gov/topic/wetlands/permitExemptions.html
- County Websites