

Recognizing *Wetlands*

Wetlands and Permitting
OPD Conference 2014

Recognizing *Wetlands*

- ☐ Wetland Definition

- ☐ Wetland Functions



Wetland Definition

United State Corps of Engineer (USACE)

“Those areas that are inundated or saturated by surface or groundwater 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. Wetlands generally include swamps, marshes, bogs and similar areas.

Design Manual - Chapter II – Section IV: WETLANDS, VEGETATION &
ENVIRONMENTAL PERMITTING 1.1.1

Wetland Definition

Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support...

When? During the growing season (when two or more plants start growing)

How Long? 5% of the growing season

Burleigh County – 7 to 8 days

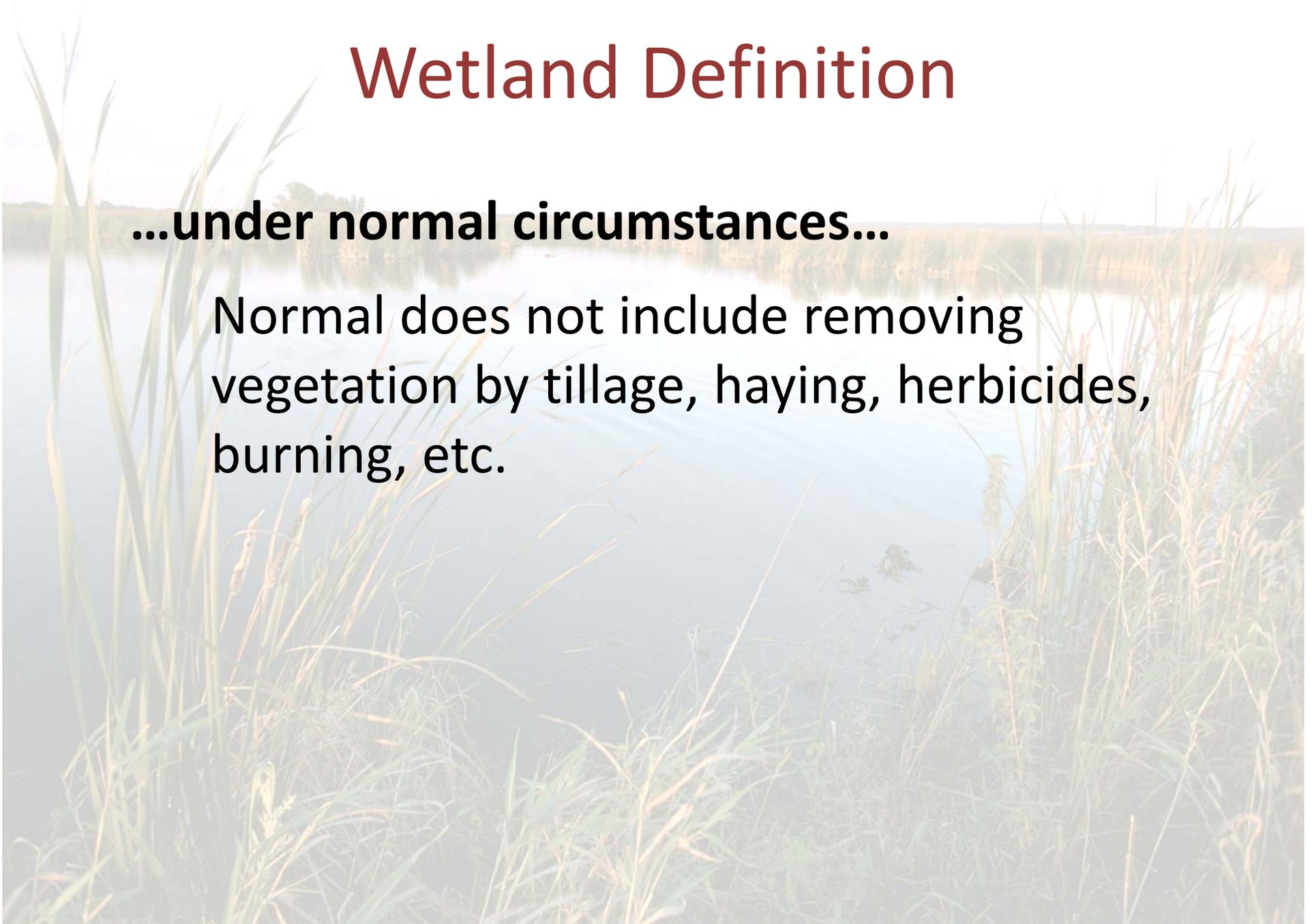
How Frequent? Most years - 50% of the time

Depth? Surface ponding or saturation in the upper part 12” except sandy soils – upper 6”

Wetland Definition

...under normal circumstances...

Normal does not include removing vegetation by tillage, haying, herbicides, burning, etc.



Wetland Definition

...support a prevalence of vegetation...

Hydrophytic Vegetation - Plants that have developed morphological adaptations to grow in saturated and ponded soil conditions – ability to bring oxygen to their root system

Wetland Definition

...typically adapted for life in saturated soil conditions.

A soil that formed under conditions of saturation, flooding or ponding long enough (7 or more days) during the growing season to develop anaerobic conditions (absence of free oxygen) in the upper part

Hydric Soils

Wetland Definition

Three Parameter (Criteria) Approach

...inundated or saturated by surface or groundwater 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.

1. Hydrology

Observed ponding or saturation
Or Indicators (24)

2. Predominance of Hydrophytic Vegetation

If vegetation is removed may have to look at
reference wetland

3. Predominance of Hydric Soils

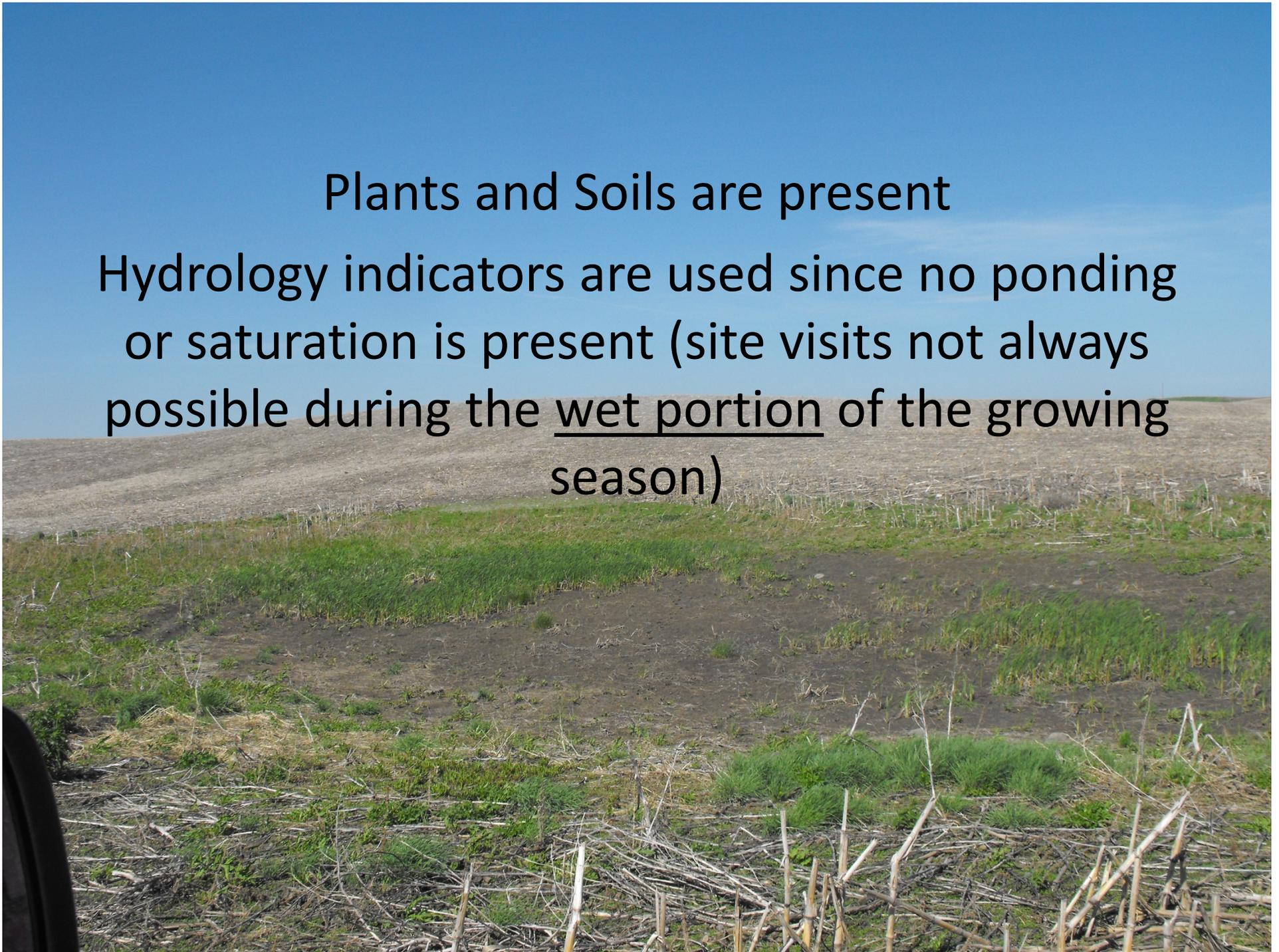
Dig a hole and look for indicators

Hydrology – Plants – Soils
All parameters are present



Plants and Soils are present

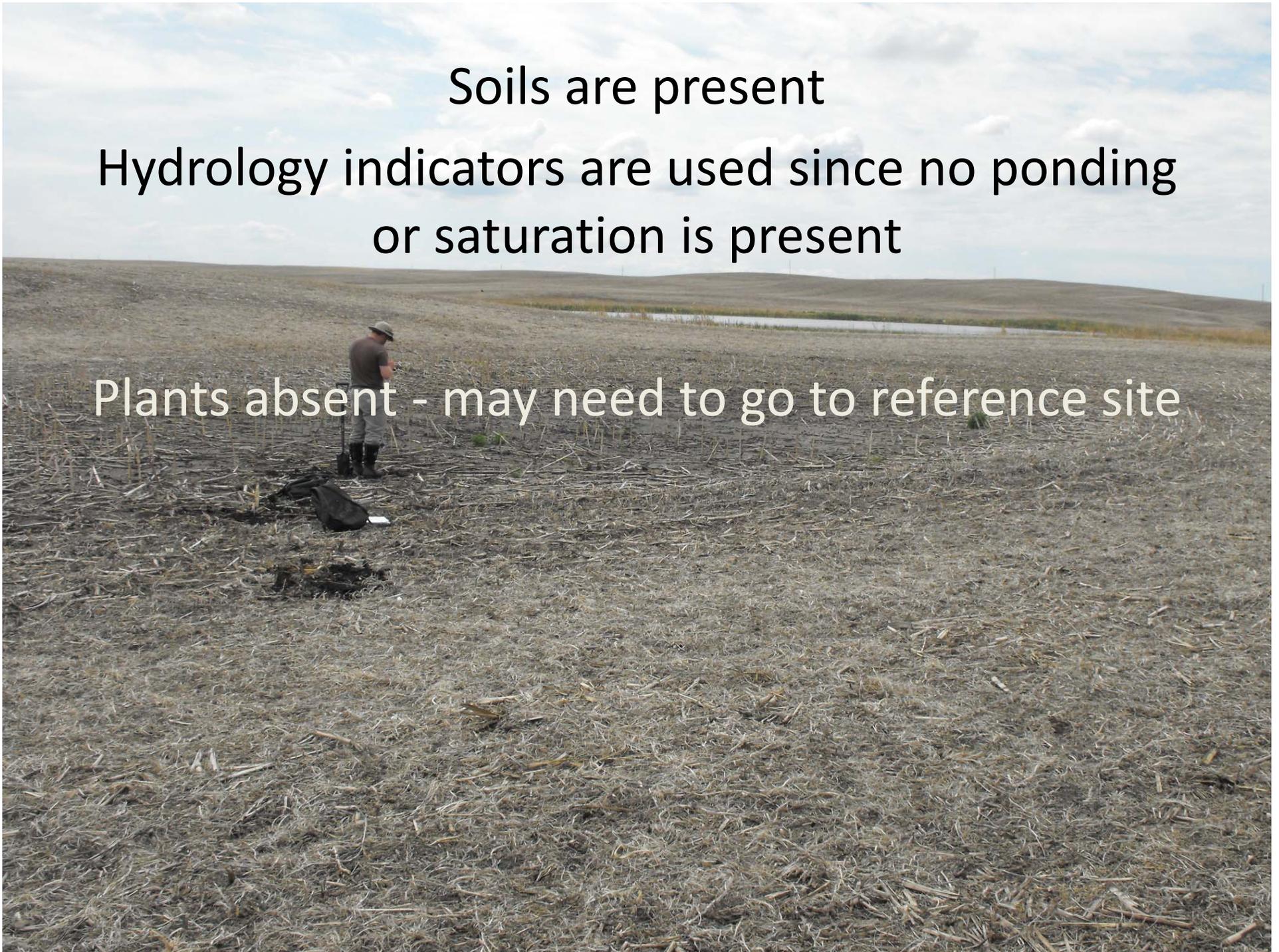
Hydrology indicators are used since no ponding or saturation is present (site visits not always possible during the wet portion of the growing season)

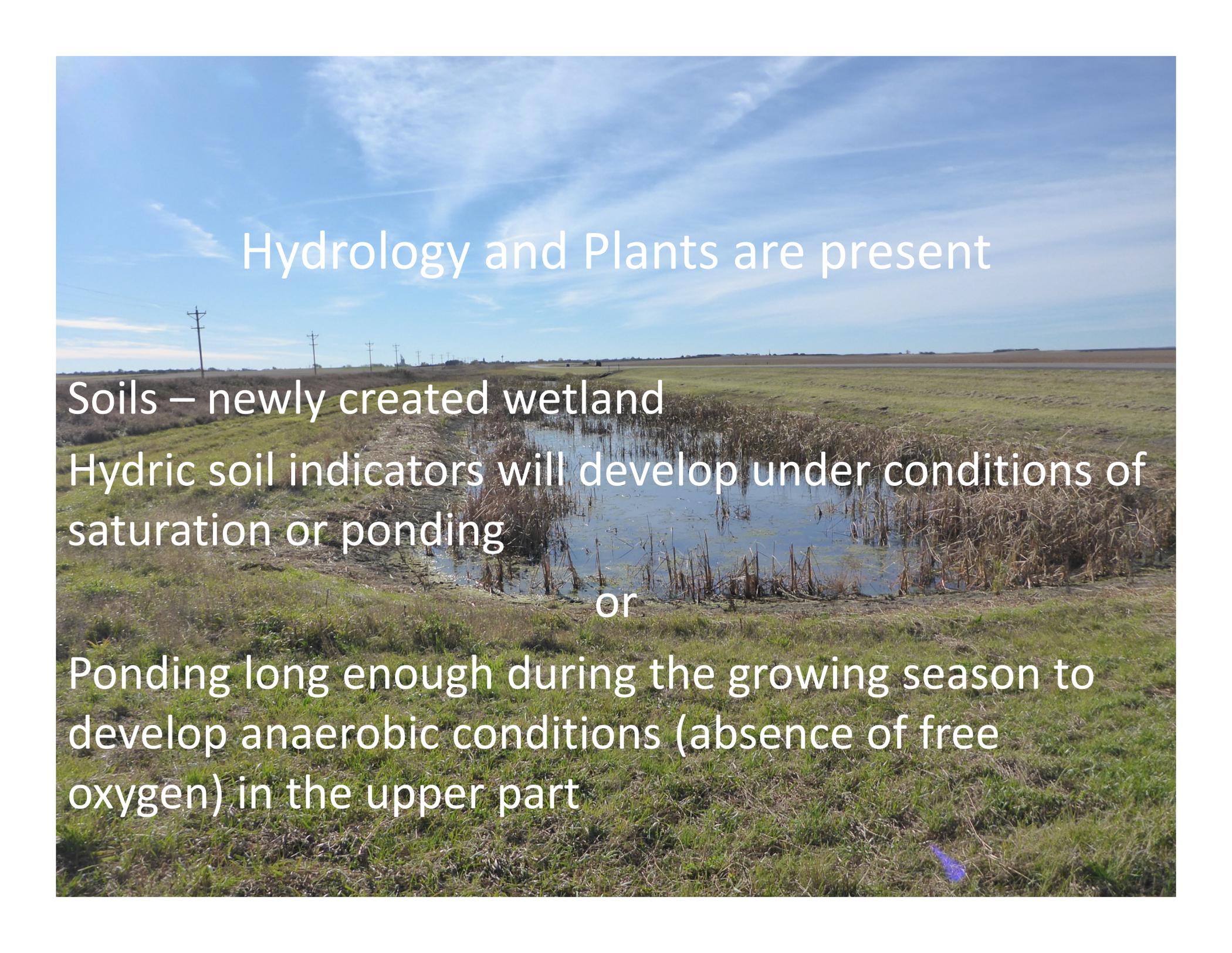


Soils are present

Hydrology indicators are used since no ponding
or saturation is present

Plants absent - may need to go to reference site





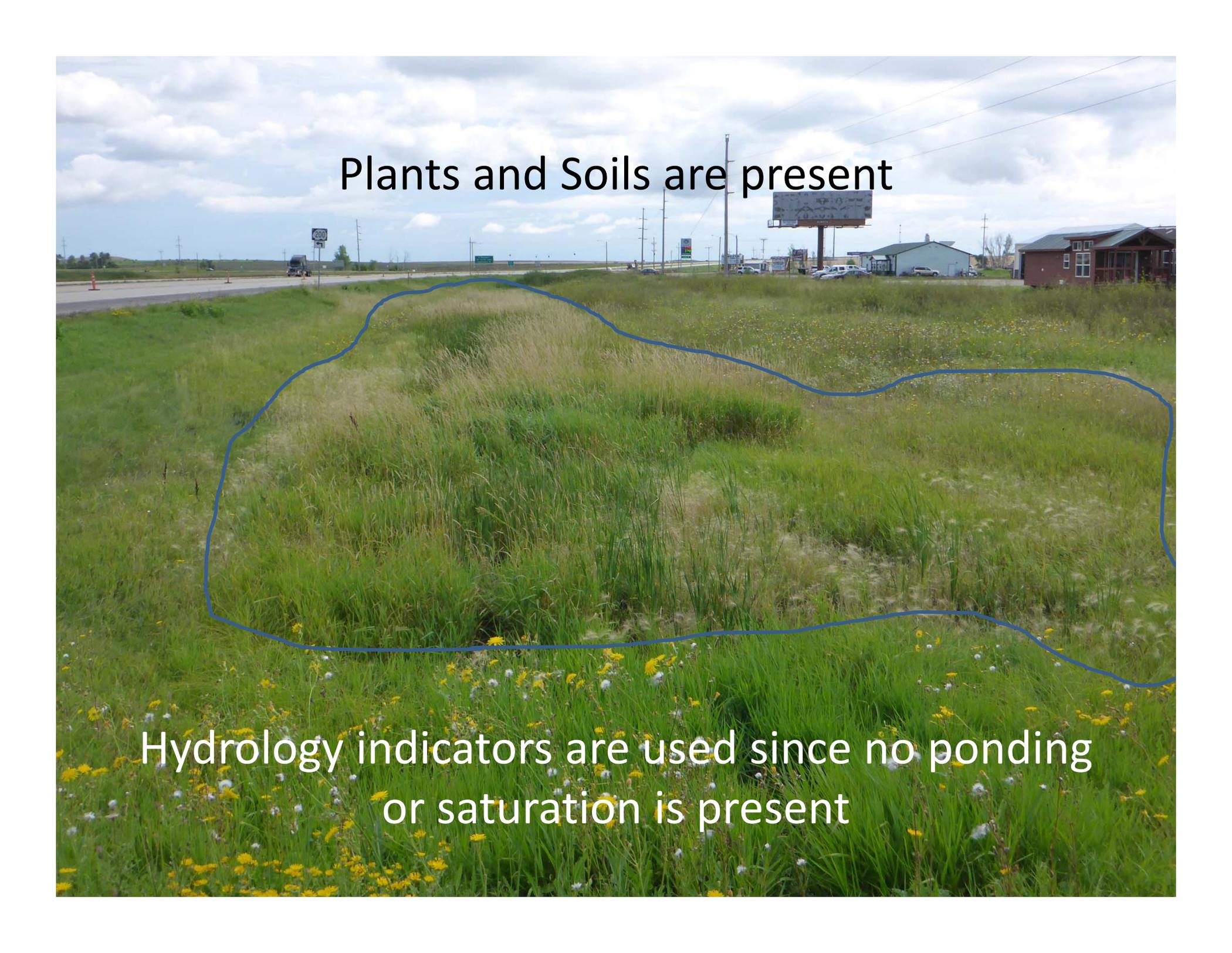
Hydrology and Plants are present

Soils – newly created wetland

Hydric soil indicators will develop under conditions of saturation or ponding

or

Ponding long enough during the growing season to develop anaerobic conditions (absence of free oxygen) in the upper part

A photograph of a grassy field with a blue outline, a road, and buildings in the background under a cloudy sky. The field is filled with green grass and yellow wildflowers. In the background, there is a road with a speed limit sign for 200, a billboard, and several buildings. The sky is overcast with grey clouds.

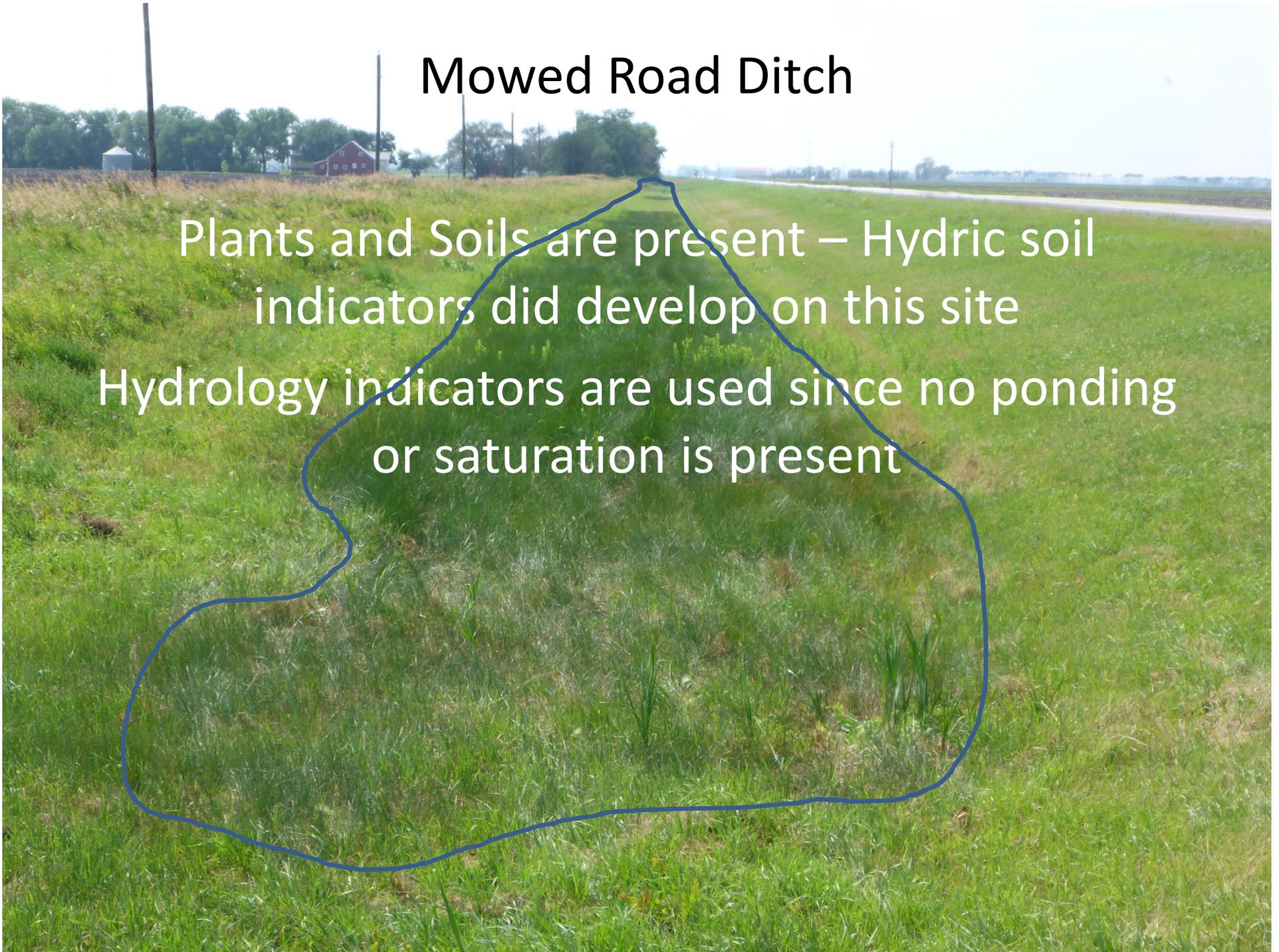
Plants and Soils are present

Hydrology indicators are used since no ponding
or saturation is present

Mowed Road Ditch

Plants and Soils are present – Hydric soil indicators did develop on this site

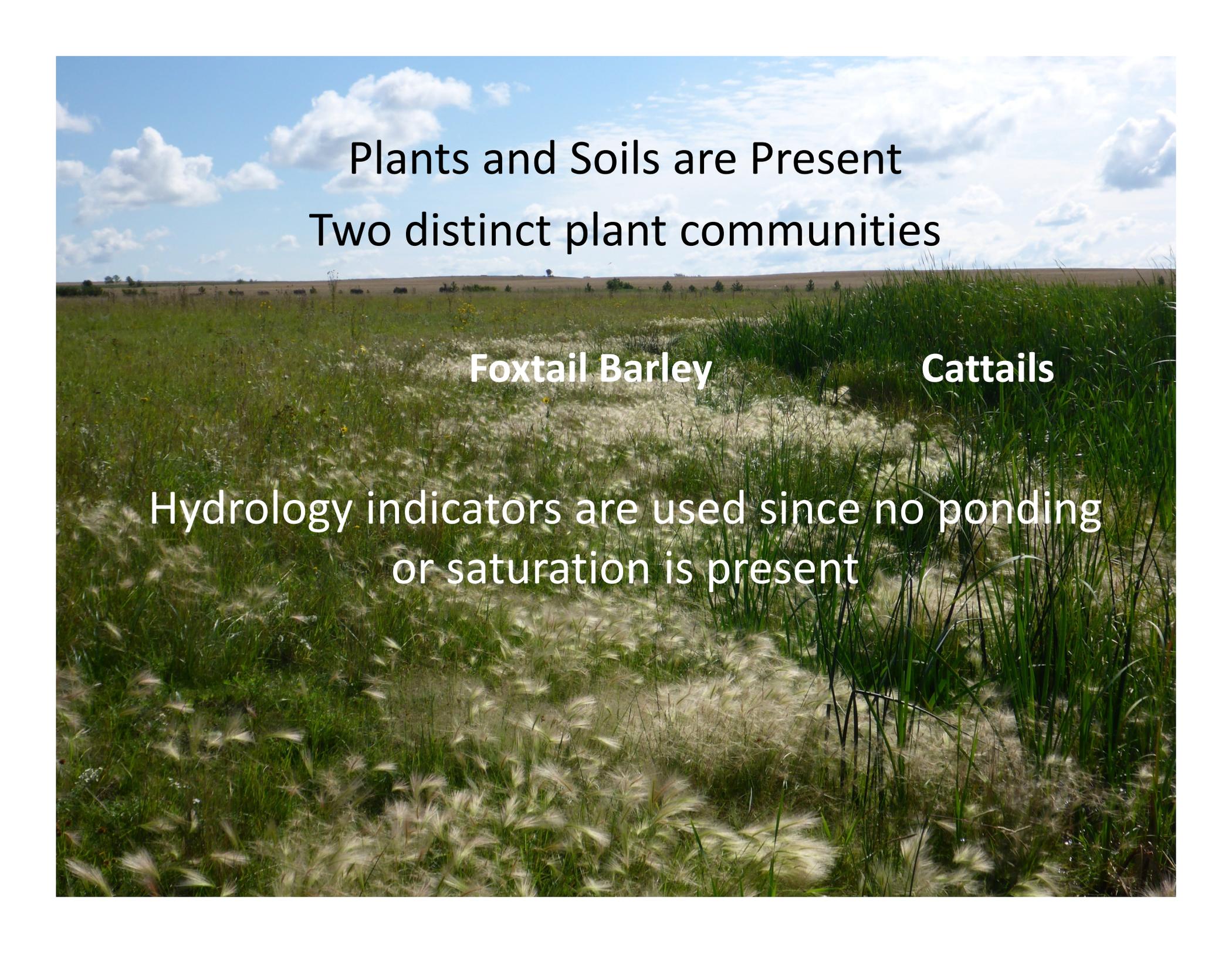
Hydrology indicators are used since no ponding or saturation is present



Plants and Soils are Present

Hydrology indicators are used since no ponding
or saturation is present





Plants and Soils are Present
Two distinct plant communities

Foxtail Barley

Cattails

Hydrology indicators are used since no ponding
or saturation is present

Wetland Definition

Wetlands generally include swamps, marshes, bogs and similar areas – Hard to related to artificial wetlands in road ditches

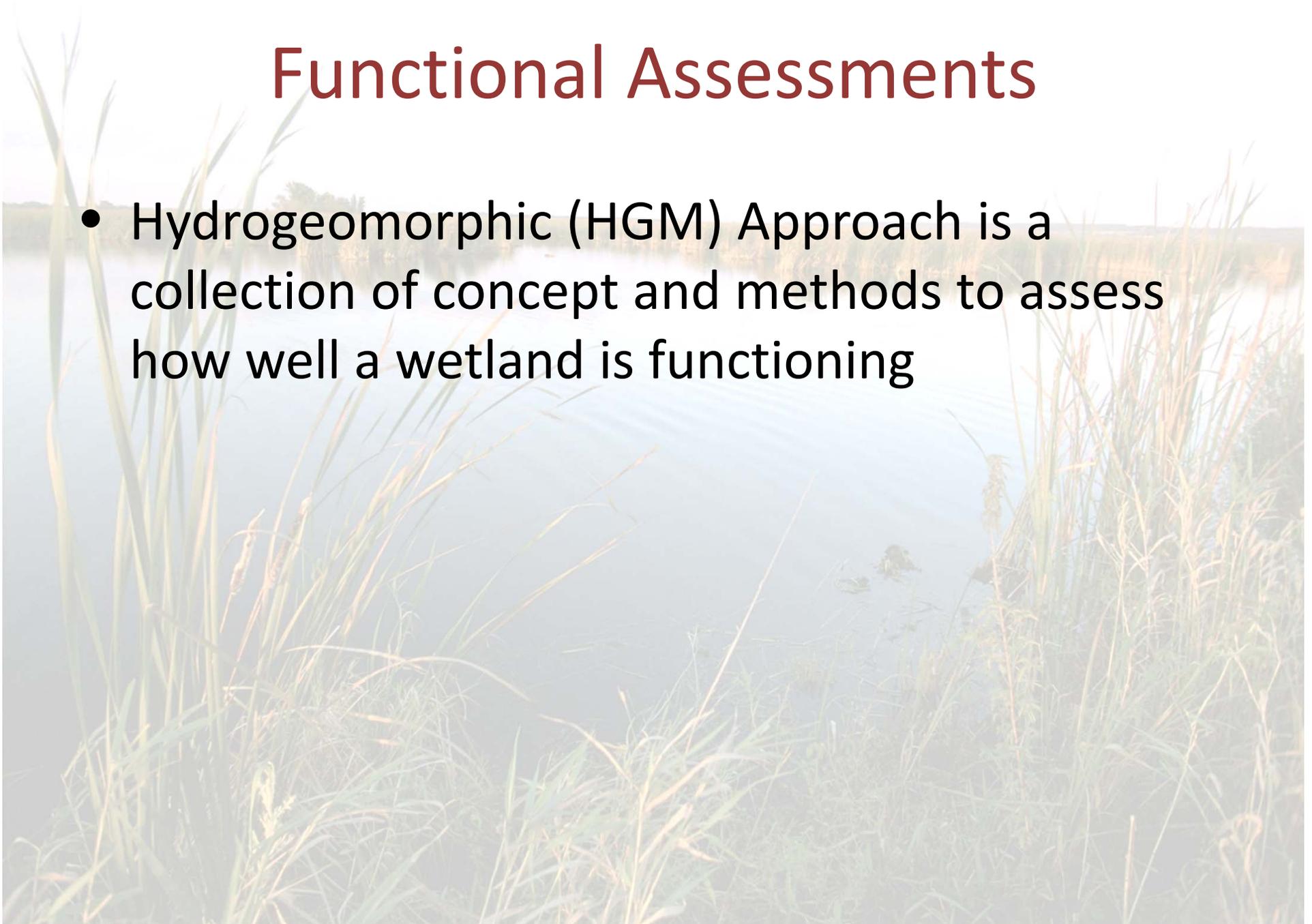
Artificial Wetlands located in road ditches do have functions

Functional Assessments

- Wetland Functions can be quantified
- USACE – Regional Guidebook for Applying the Hydrogeomorphic Approach to Assessing Wetland Functions of Prairie Potholes
- Peered Reviewed – Approved by EPA, FHWA, USFWS, USDA/NRCS, NOAA

Functional Assessments

- Hydrogeomorphic (HGM) Approach is a collection of concept and methods to assess how well a wetland is functioning



Functional Assessments

- **Hydro** - Water source and its transport - precipitation, surface/near surface flow, and ground water discharge
- **Hydrodynamics** - direction and strength of the water flow
- **Geomorphic setting** - topographic location within the surrounding landscape

Regional Wetland Subclasses

North Dakota

Geomorphic Setting	Dominant Water Source	Wetland Types In North Dakota
Depression	Groundwater or surface inflow	Prairie pothole marshes; ponded excavated ditches
Fringe (lake shoreline)	Lake (<2.0 meters)	Lakes with wetland fringes
Slope	Groundwater (near surface flow)	Fens; road side ditches with seepage or flowing water
Riverine	Overbank flow from channel	Wetlands adjacent to creeks, streams, or rivers; bottomland hardwood forests

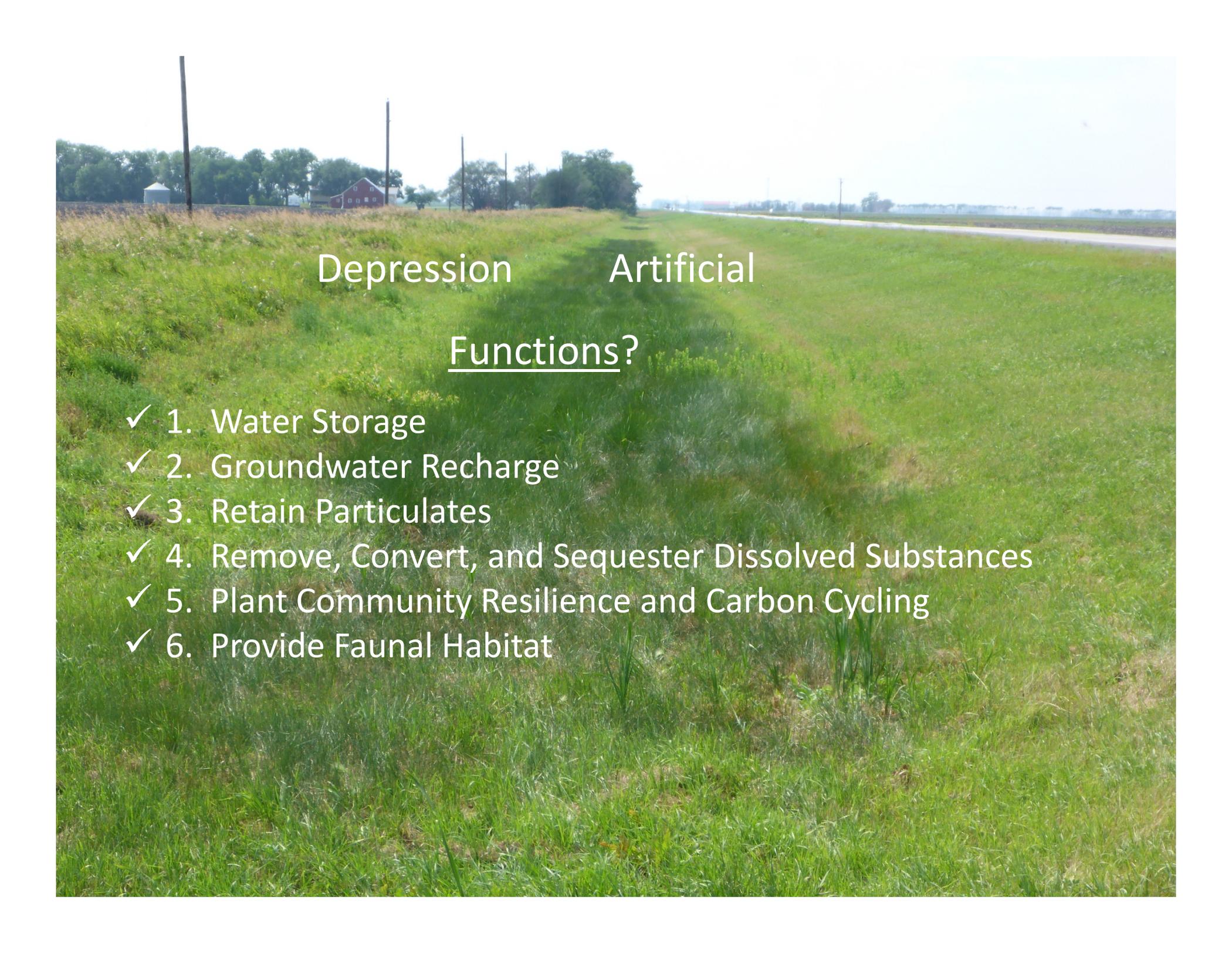
Mineral Soil Flats, Organic Soil Flats, Estuarine Fringe

Functional Assessments

- Models are developed for a specific type of wetland
- Prairie Potholes
- Slope wetlands
- Riverine, etc.

Prairie Pothole Wetland Functions

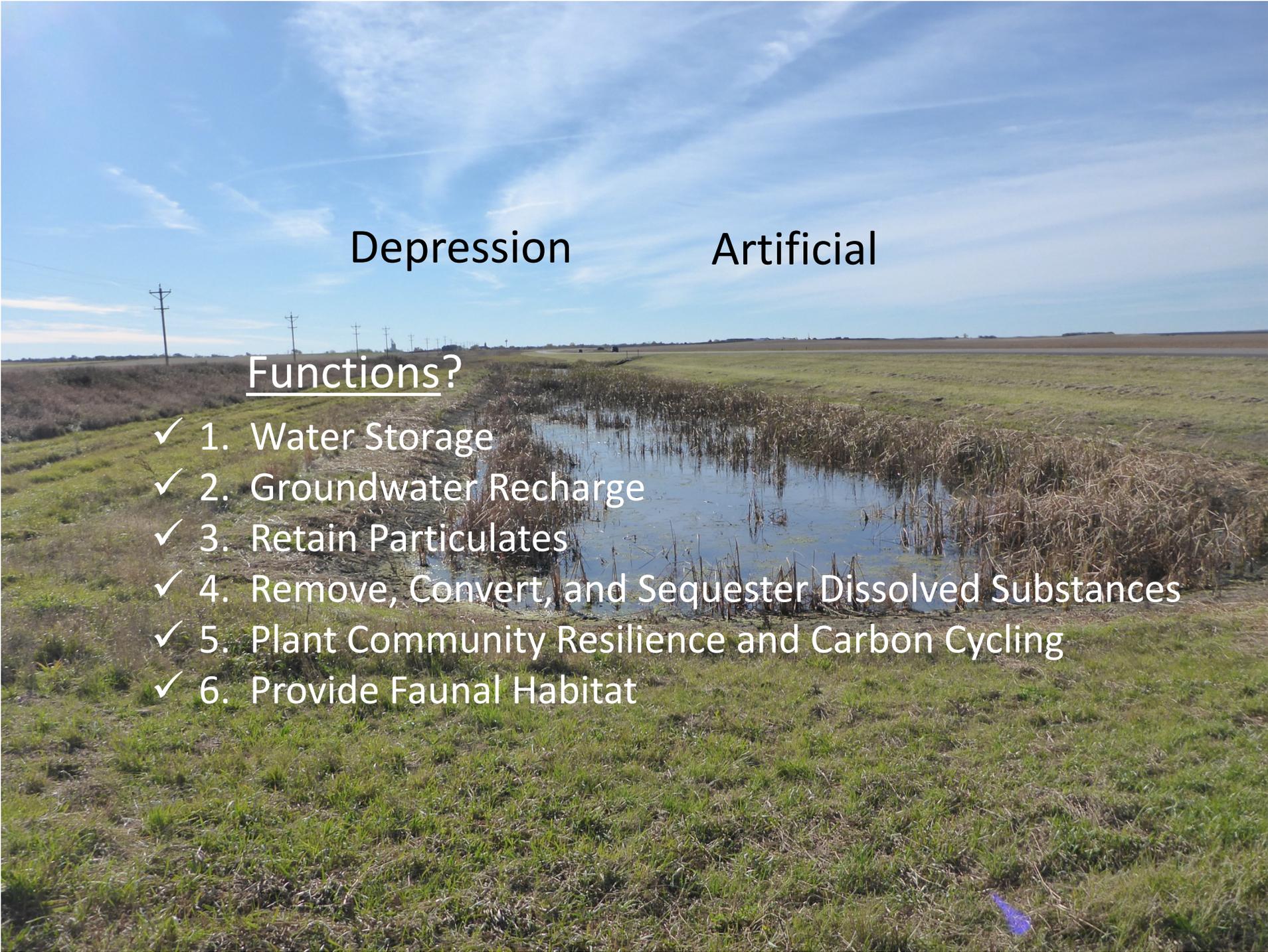
1. Water Storage
2. Groundwater Recharge
3. Retain Particulates (sediment and attached substances)
4. Remove, Convert, and Sequester Dissolved Substances
5. Plant Community Resilience and Carbon Cycling
6. Provide Faunal Habitat (invertebrates, waterbirds, mammals, etc.)

A photograph of a grassy field with a road and buildings in the background. The field is lush green with some taller grasses. In the distance, there is a road, utility poles, and a red barn. The sky is overcast.

Depression Artificial

Functions?

- ✓ 1. Water Storage
- ✓ 2. Groundwater Recharge
- ✓ 3. Retain Particulates
- ✓ 4. Remove, Convert, and Sequester Dissolved Substances
- ✓ 5. Plant Community Resilience and Carbon Cycling
- ✓ 6. Provide Faunal Habitat



Depression

Artificial

Functions?

- ✓ 1. Water Storage
- ✓ 2. Groundwater Recharge
- ✓ 3. Retain Particulates
- ✓ 4. Remove, Convert, and Sequester Dissolved Substances
- ✓ 5. Plant Community Resilience and Carbon Cycling
- ✓ 6. Provide Faunal Habitat



Depression Artificial

Functions?

- ✓ 1. Water Storage
- ✓ 2. Groundwater Recharge
- ✓ 3. Retain Particulates
- ✓ 4. Remove, Convert, and Sequester Dissolved Substances
- ✓ 5. Plant Community Resilience and Carbon Cycling
- ✓ 6. Provide Faunal Habitat

A photograph of a rural landscape. A paved road with a yellow center line runs from the bottom left towards the center. To the right of the road, there is a grassy area with a small pond or depression. A blue outline highlights a slope leading down to the pond. In the background, there are several large white barns and a utility pole. The sky is clear and blue.

Depression

Slope

Functions?

1. Water Storage – limited water flows through wetland
2. Groundwater Recharge – Acting as discharge site
- ✓ 3. Retain Particulates
- ✓ 4. Remove, Convert, and Sequester Dissolved Substances
- ✓ 5. Plant Community Resilience and Carbon Cycling
- ✓ 6. Provide Faunal Habitat



Depressional Natural
Wetland

Functions?

- ✓ 1. Water Storage
- ✓ 2. Groundwater Recharge
- ✓ 3. Retain Particulates
- ✓ 4. Remove, Convert, and Sequester Dissolved Substances
- ✓ 5. Plant Community Resilience and Carbon Cycling
- ✓ 6. Provide Faunal Habitat













Wetland

Surface drain





Questions??

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NDDOT
North Dakota
Department of Transportation