

## Wetland Restoration Overview

## Wetlands in MN

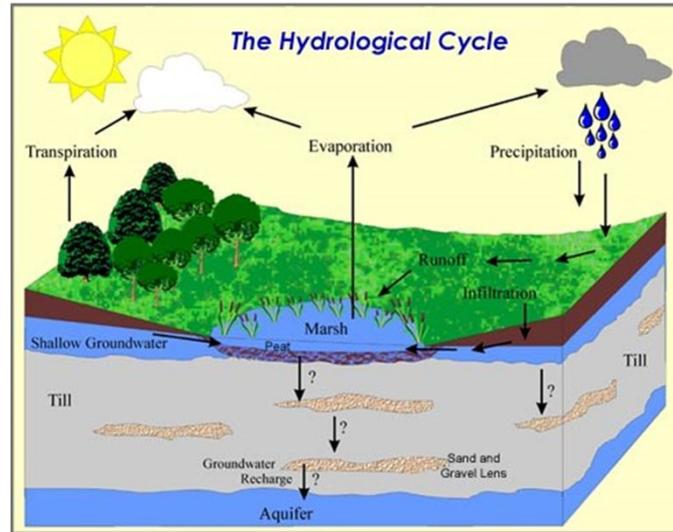
- Wetlands cover 8.7 million Acres
- 9.7 million acres of Wetlands have been drained or filled

Source: BWSR Wetland Restoration Guide (U. of MN, 1984)

Wetlands are a major landscape feature in Minnesota, covering upwards of 8.7 million acres or 16 percent of the land area in the state.

Many wetlands were subsequently drained in the early part of the 20th century for agricultural development. Later on, more wetlands were filled and drained for building of homes, roads, and overall modern development. Drainage for agricultural purposes continues to this day. In Minnesota, an estimated 9.7 million acres of wetlands have been drained or filled over the last one-hundred plus years (U. of M, 1984). Some areas of Minnesota have lost more than 90% of their original wetlands, primarily for agricultural production.

# Hydrologic Cycle of Typical MN Pothole Wetland



## Wetland Benefits

- Erosion Control
- Flood Control
- Ground water recharge & Discharge
- Water quality
- Rare Species Habitat
- Recreation
- Wildlife Habitat

Source: BWSR Wetland Restoration Guide (U. of MN, 1984)

This loss of wetlands has led to significant changes in the hydrology, water quality, and wildlife populations in the state.

Scientific understanding of the functions that wetlands provide increased, and policy makers began to craft regulations to protect existing wetlands and to provide funding for conservation projects and programs that encourage the restoration of wetlands. Minnesota's wetlands are now widely appreciated for their multiple benefits, several of which are listed below:

Erosion control—Vegetation along lakes and streams reduce erosion caused by wave action.

Flood control—Wetlands reduce flooding by slowing excess water runoff during times of heavy rainfall.

Ground water recharge and discharge—Some wetlands serve as a source of groundwater recharge while other wetlands are groundwater discharge areas, providing continuous water sources for rivers and streams.

Water quality—Wetlands improve water quality by filtering sediments, nutrients, and toxic substances out of water before it washes into rivers and lakes.

Rare species habitat—Approximately 43 percent of threatened or endangered species in the United States live in or use wetlands.

Recreation—Wetlands are used for canoeing, hunting, fishing, birding, and outdoor education.

Wildlife habitat—A wide variety of wildlife species such as fish, amphibians, reptiles, aquatic insects, birds, and mammals rely on wetlands for habitat.

## What does Altered Wetland Mean?



## What does Altered Wetland Mean?

- Decreases the input or increases the output



Drainage – anything that decreases the input or increases the output

## Effectively Drained

- A condition where ground or surface water has been removed



A condition where ground or surface water has been removed by artificial means to the point that an area no longer meets the wetland hydrology criterion. Artificial means is usually a ditch, tile or diversion.

## Restoration vs Creation vs Enhancement

- Wetland Restoration
- Wetland Creation
- Wetland Enhancement

Wetland restoration refers to re-establishing or rehabilitating a former or degraded wetland, with the primary goal being restoring its natural, historic wetland functions to a close approximation of the original.

Wetland creation refers to the construction of wetlands in locations where they did not previously exist. Wetland creations are often referred to as constructed wetlands. Some wetland creations are conducted in uplands adjacent to pre-existing or restored basins.

Wetland enhancement refers to activities performed in existing and altered wetlands that heighten, intensify, or improve one or more specific wetland functions. Wetland enhancements can be difficult to distinguish from wetland restorations: both can occur when working in partially drained or degraded wetlands.

## What NRCS Practice Standard Number am I??

A. 657

B. 658

C. 659

Wetland Creation

A

B

C

Wetland Enhancement

A

B

C

Wetland Restoration

A

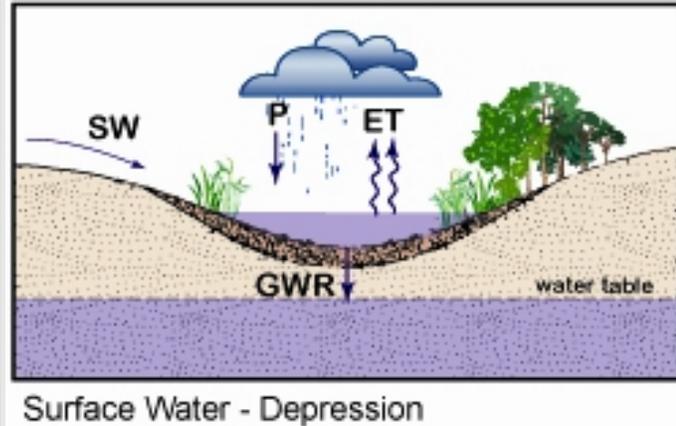
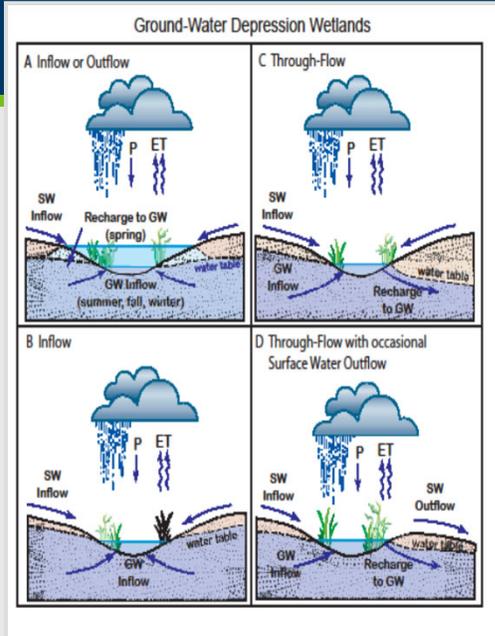
B

C

## What NRCS Practice Standard Number am I??

	A. 657	B. 658	C. 659
Wetland Creation	A	<b>B</b>	C
Wetland Enhancement	A	B	<b>C</b>
Wetland Restoration	<b>A</b>	B	C

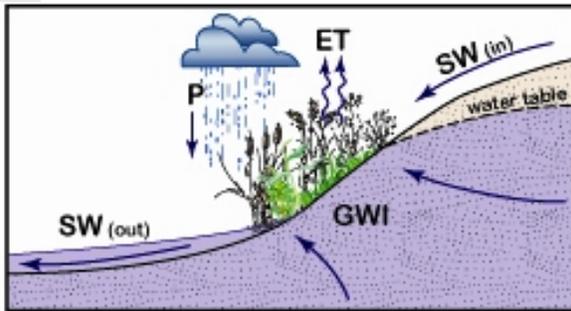
## Depressional Wetland



- Groundwater or Surface water supported
- A groundwater supported depressional wetland is recharged by groundwater. Ground water wetlands are marshes, sedge meadow, and fens.
- Surface water depressional wetlands are recharged by surface water. Surface water supported wetlands are seasonal wetlands, sedge meadows, and marshes.

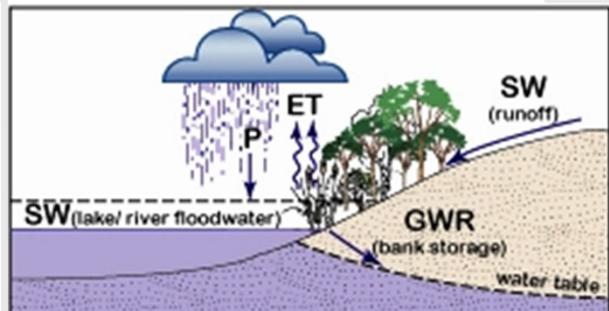
## Sloped Wetlands

- Ground Water Supported



Ground Water - Slope

- Surface Water Supported



Surface Water - Slope

### Ground Water Supported

- Marshes
- Fens

### Surface Water Supported

- Marshes
- Shrub Swamps
- Riverine Wetlands
- Floodplain Forests

## Why is it important to know the type of Wetland?

- Influences how they were drained
- How to restore them



It is important to understand what type of wetland you have because it influences how and to what extent the wetland is drained. And it also influences the strategies used to effectively restore them.

- Surface Water Supported Wetland



Restoration of a surface water supported (discharge) wetland may require sealing off of breaches through the wetland's substrate. If those are not sealed, the wetland's ability to retain hydrology may still be limited.

## Wetlands Farmed Under Natural Conditions

- Hydrology has not been manipulated
- Hydrophytic vegetation has been removed
- Often mapped by NRCS as a “W”



Wetlands that are farmed under natural conditions include wetlands where the hydrology has not been manipulated by drainage or filling but rather hydrophytic vegetation has been removed by annual cropping.

Often, but not always, these wetlands are mapped by NRCS as a “W”

## Wetlands Farmed under Natural Conditions

- Restoration is achieved by re-establishing hydrophytic vegetation



- **Restoration is often referred at “Crop Cessation”**
- **Restoration is achieved by re-establishing hydrophytic vegetation suitable for the site or through natural colonization if best professional judgement determines an adequate seedbank is already present**

## Drained and Altered Wetlands

- Hydrology has been manipulated
- Often mapped by NRCS as a “FW” and “PC”



- Prior Converted
- Includes wetlands that has had their hydrology manipulated by drainage, fill, or by other means
- Often, but not always, mapped by NRCS as a “FW” or “PC”

## Drained and Altered Wetlands

- Restoration should address both hydrology and vegetation



- Restoration should address both hydrology and vegetation.
- Restoration is achieved by:
  - Re-establishing hydrophytic vegetation suitable for the site or through natural colonization if best professional judgement determines an adequate seedbank is already present
  - AND
  - Restoration of the site hydrology to the extent feasible and practicable

## What are some examples of Restoration Strategies

Tile Block

Ditch Plug

Rain Garden

Watering Tank

## Common Restoration Strategies

- Tile Blocks
- Outletting Incoming Drainage Tile
- Rerouting Tile and Ditch Systems
- Removing, Relocating, and Installing Drainage Lift Stations
- Sediment/Vegetation Removal
- Ditch Blocks and Fills
- Earthen Embankments
- Wetland Outlets