



**COMING SOON**

# Wetland Restoration Guidance

**Presented by: Laura Lapierre, DEC Wetlands  
Program Manager**

# Benefits of Wetland Protection and Restoration



- Natural attenuation of stormwater runoff and flood waters
- Mitigate erosive forces
  - Surface and groundwater protection
  - Habitat for wildlife, migratory birds, fish, and rare, threatened or endangered species
  - Recreation
  - Aesthetics



# Wetland Restoration Map

The Lake Champlain Basin Wetland Restoration Plan identifies wetland restoration opportunities with goal of reducing phosphorus in Lake Champlain to meet TMDL targets. Revision leveraged with a Regional Conservation Partnership Program Grant, NRCS.



Learn more:

<https://dec.vermont.gov/watershed/wetlands/protect/restore>





# Wetland Screening Tool

Address  SPAN 1 market street south burlington

Submit Clear Print

Status:	14/14 queries completed... DONE!
Matching Address:	396 DORSET ST. SOUTH BURLINGTON, 05403
Grand List Owner:	
SPAN:	
District Wetland Ecologist:	Tina Heath, Phone: 802-495-1393

[Link to Wetland Map](#)

**Wetland Screening Result: Very Likely** <

Wetland Project within (500ft.) <

Issued Wetland Permit (within 1000ft.) <

Vermont Significant Inventory Map <

Vermont Significant Inventory Map (within 300ft) <

Wetland Advisory Maps <

Wetland Advisory Maps (within 300ft) <

Hydic Soils (FACW) <

Hydic Soils <



# Water Quality Project Sometimes Need Wetland Permits or Approval

## VT Wetland Classification

🌀 Based on an evaluation of the extent to which the wetland provides functions and values:

- *Class I Wetland*: Exceptional or irreplaceable. Highest level of protection
- ***Class II Wetland*: Merits protection**
- *Class III Wetland*: Neither Class I or Class II wetland

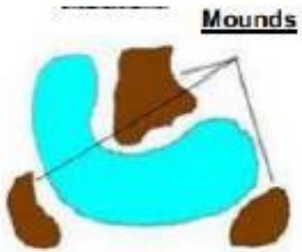
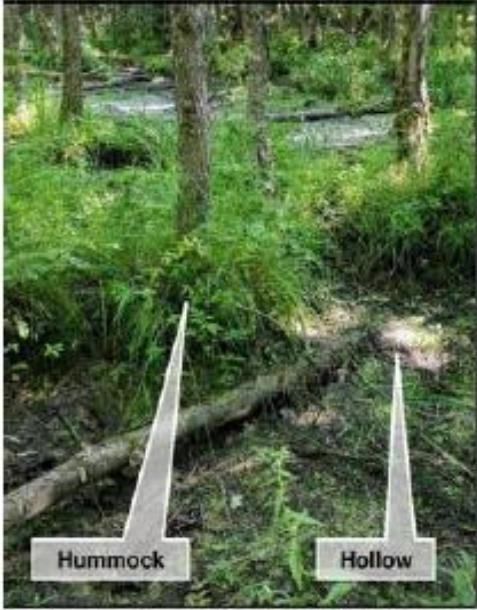


**Restoration  
is an  
Allowed Use**

Activity in a Class I or Class II wetland or its associated buffer zone is prohibited unless it is an allowed use or authorized by a permit.

Allowed Use 6.23: Wetland restoration or stream restoration projects, including dam removals, in accordance with a plan approved by the Secretary.





Wetland Restoration Guidance will be completed this year!

For some practices, guidance may qualify as allowed use. More complex practices will still need an individual program approval.

# Guide Content

Goal: Providing tools and guidance to develop a wetland restoration plan.

Plans are for:

- Self-sustaining natural systems
- Follow the likely original topography and hydrology
- Meet the confines of the situation (e.g. not flooding neighbors)
- Passive or active actions items

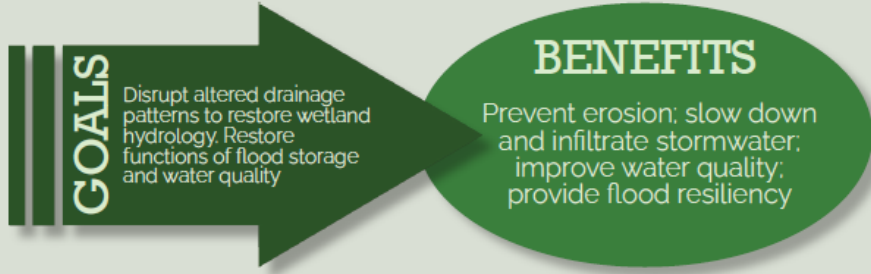


# Detailed Practices in Guide

**Wetland Revegetation**  
**Invasive Species Management  
and Control**  
**Ditch Plugs and Fill**  
**Removal of Sediment and Fill**  
**Surface Drainage Reroute**  
**Tile Drain Blocks**  
**Hummock/Hollow Topography**  
**Shallow Depressions/Scrapes**  
**Large Woody Debris**

### 3.4 Ditch Plugs

Ditches confine water and restrict contact of water with vegetation. Ditches also lower water tables and route water quickly through wetlands. Wetlands with artificial drainage patterns have diminished capacity to slow down and store flood waters. Ditch plugs, or restoring a portion of a ditch to the natural ground level, create an earthen wall that impounds water that then floods the ditch and reconnects with the surrounding wetland. Ditch plugs are intended for artificial drainageways, not stream channels. This can be a quick and inexpensive hydrologic restoration practice.



- 1 Identify Plug Material
- 2 Determine Plug Locations
- 3 Identify Staging and Access
- 4 Construct Plugs
- 5 Stabilize Site
- 6 Monitor for Success

### DEFINITIONS

**Ditch Plug:** Earth fill placed at strategic locations in a drainage ditch to block water flow.

**Organic soil:** Soils formed from sedimentation and primarily composed of organic matter (i.e. plant materials)

**Mineral Soil:** Soils formed from weathering of rocks and contains little organic matter.

CHAPTER 3. WETLAND RESTORATION PRACTICES  
- DITCH PLUGS

Ditch Plug Example



# Example Practice Pages

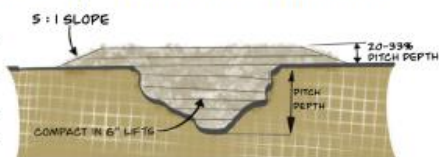
By Arrowwood Environmental



### Ditch Plug Specification

Ditch plugs are made from soil, either sourced on site or imported from clean off site material.

<b>Length</b>	75'-150'+
<b>Side Slope</b>	5:1
<b>Material</b>	Soil collected on-site, or imported
	Mineral Soil- i.e. clay soils
	Plug at least 75' of ditch
	Compact in lifts of 4-6"
	Rise 20% of ditch depth above surrounding ground
	Organic Soil- i.e. peat soils
	Plug at least 150 ft of ditch
	Compact in lifts of 4-6"
	Rise 33% of ditch depth above surrounding ground



Shorter plugs can be used with shallower ditches, generally less than 2' in depth. A length of less than 50' is not recommended. (BWSR, Minnesota Wetland Restoration Guide, Blocking and Filling Surface Ditches, 10/14/2015; State of Michigan, Landowner's Guide: Wetland Restoration Techniques, 1999)

### Pre-construction Planning

#### Identify Plug Material

Look for spoils from the original ditching along either side of the ditch. Additional sources of on-site material can come from other restoration practices (i.e. depression excavations). If importing soil, use clean fill from a location where non-native invasive species (NNIS) are not found.

#### Determine Plug Locations

A single plug can work in a relatively flat/level site. Locate the plug at the edge of the desired wetland restoration area. Multiple plugs are needed on sloped sites. Locate one plug at the bottom or lowest elevation of the restoration area and additional plugs moving upslope. Spacing or stepping the plugs one to three feet of vertical feet is recommended to reduce excessive pressure between the plugs. (BWSR, Minnesota Wetland Restoration Guide, Blocking and Filling Surface Ditches, 10/14/2015)

#### Identify Staging Location

Find an onsite staging location for temporary storage of imported soils (as needed) and parking of equipment.

#### Identify Access Routes

Use of existing roads and trails without improvement are allowed. Temporary use of swamp mats is also allowed.

#### Select a Contractor & Equipment

Choose a contractor with previous experience working in wetlands and who has low ground pressure equipment such as a backhoe with wide tracks, Meet with contractor to review project details including site access and staging location, the specifications for plug material and plug installation, and NNIS control/management procedures (See Invasive Species Control and Management Practices). Plan work for dry field conditions with no/minimal flow present in the ditch.



### Construction Sequencing

1. Stock pile imported soils in staging area. Use erosion control measures if storage is for long periods of time.
2. Stake out location of plugs along ditch. Stakes at both ends of the plug will guide the contractor and prevent over/under filling.
3. Strip existing material from where the plug will be installed in the ditch. Remove all vegetation, roots, organic matter and unsuitable sediments. Depending on field conditions the stripping could be done by hand or with the backhoe.
4. Install plugs depending on fill material per specifications above. Dewatering may be needed for installation and compaction. [See Temporary Dewatering Supplemental Practices.](#)
5. Securely stabilize the site through appropriate erosion control measures. Seed and mulch all disturbed soils. [See Erosion Control Practices.](#)



Photo credit: Ryan Crehan/USFWS, Plug in process

### Ditch Plug Challenges

- Controlling impacts to upslope and downslope ditch property owners. If the subject ditch is not confined to the project property do not place plugs within 25' of the property line. This will allow a buffer to the neighboring property from any unanticipated impacts from the ditch plugs.
- Settling of fill material. Overfilling the ditch seeks to offset the settling but addition of fill may be necessary over time.
- Erosion of the ditch plug before vegetation reestablishment. Timing of construction during low flow conditions and quick attention to seeding and mulching when construction is complete will assist with vegetation establishment and stability of the site.
- Introduction of invasive species. If work crews are used, ask them to clean tools and boots and power-wash equipment before entering the restoration site. Work with contractor to minimize soil disturbance.

Construction of new roads or trails to access or construct ditch plugs or stock-piling soil in a wetland or wetland buffer will trigger additional permitting.

### Complementary Practices:





# Additional Guide Content

Regulatory Considerations

Evaluating Site Success

Reporting

