

# Wetland Restoration

Mike Malling – USFWS Biologist



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# What is the U.S. Fish and Wildlife Service?

We are a federal agency with a mission of working with others to conserve, protect and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people. We are the only agency of the U.S. Government with that primary mission.



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# What Do We Do?

Manage Migratory Birds  
Endangered Species  
Marine Mammals  
National Fish Hatcheries  
National Wildlife Refuges  
Waterfowl Production Areas  
Partners for Fish and Wildlife  
Invasive Species



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# My Job As A Biologist

Acquire, Restore, and Manage Habitat  
Partners Fish and Wildlife Program  
Private Lands  
Waterfowl Production Areas  
Partnerships and Grants  
Prescribed Fire Management  
Design Management Plans  
Conflict Management  
Surveys and Waterfowl Banding  
Landscape Assessments



18 Acre Drained Basin (1995)



18 Acre Basin Restored In 1995 Through A Partnership With The  
USFWS And The Metropolitan Council

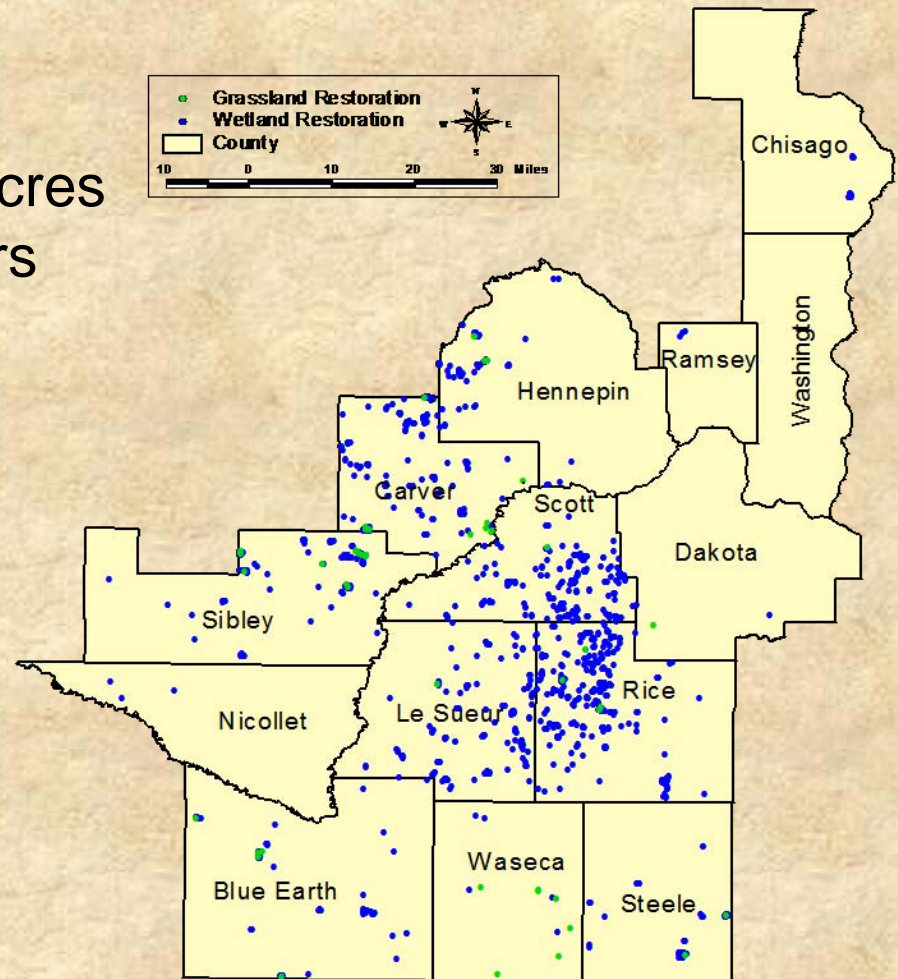


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# Accomplishments

Acquired 15,000 acres  
Restore and Manage 20,000 acres  
Worked with > 1200 landowners  
1451 wetland basins  
241 grassland sites  
20 riparian projects  
Technical help > 2,000 sites



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# Presentation Objectives

Wetland Restoration – Just the Basics  
Case Studies – Successes



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# Wetland Status and Trends

U.S. loss approaching 50%

Some MN Counties have lost > 95%

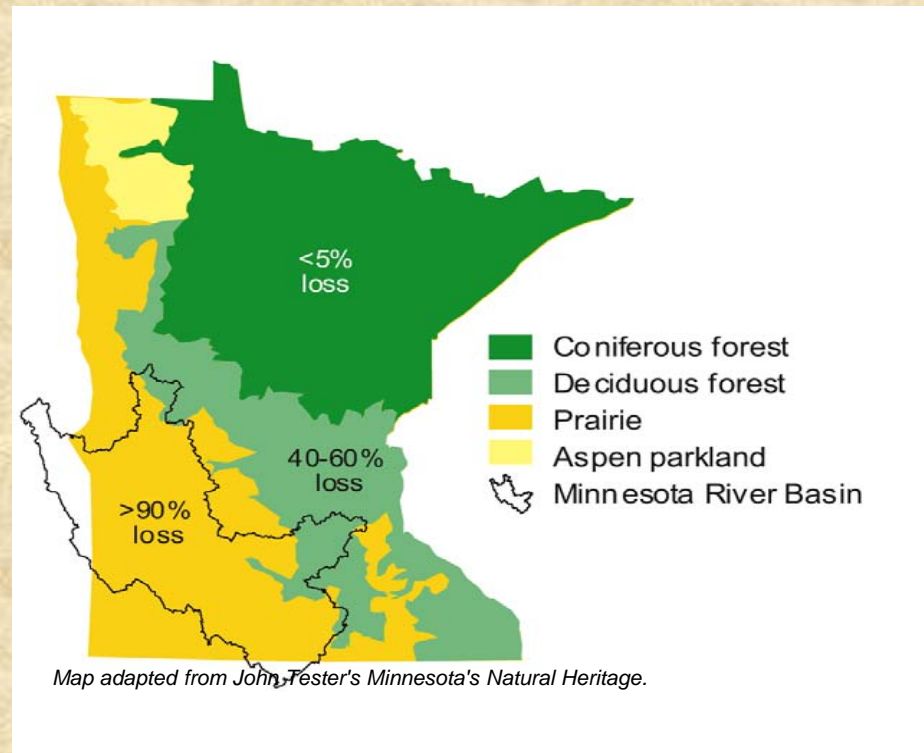
Agriculture

- tiling and ditching

Development and logging

Diversion and transportation

Conversion



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# Wetland Types

Aren't they all the same?  
No!

Temporary  
Ephemeral  
Seasonal  
Semi - Permanent  
Permanent  
Lakes



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# Wetland Types

Temporary  
Sheet water

Shallow  
Short duration  
Invertebrates  
Migration  
Breeding



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# Wetland Types

## Ephemeral

Wet meadow

Saturated

Short duration

Sedges Flowers

Migration

Breeding



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# Wetland Types

Seasonal  
Sheet water

Up to 12"  
Weeks to months  
Nesting  
Migration  
Feeding



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# Wetland Types

## Semi Permanent

Longer duration

Classic marsh

Up to 36"

Many life cycles

Many species



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# Wetland Types

## Lakes

All summer  
Open  
Up to 60"  
Rings of Veg.  
Staging  
Many species



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# So Which is the Best Wetland?

They all Are!

Wetland Complexes

Serve different roles

At different times

For different species



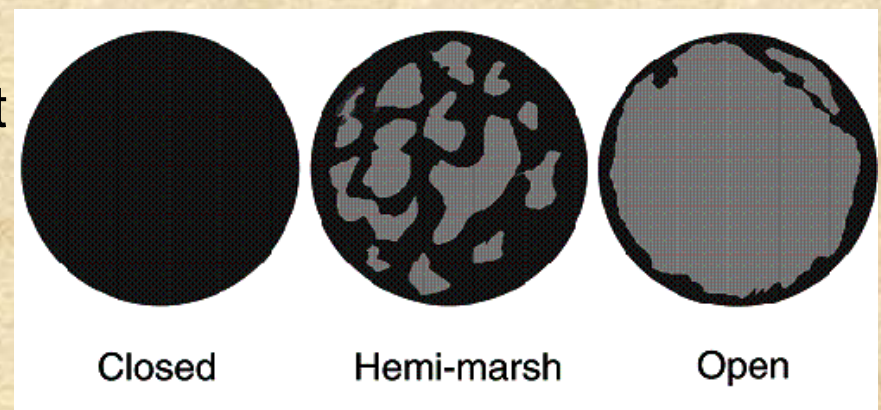
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# Common Wetland Restoration Mistakes and Misconceptions

Deeper water is better  
Open water is best  
Too much vegetation  
Weedy mess  
Trying to recreate wrong type  
Different expectations  
Dugouts are beneficial  
Wetlands always need water  
Constant water levels are best  
Drought is bad  
They are full of mosquitoes  
Islands are great habitat



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# What Makes a Successful Wetland Restoration

- Complex of wetlands
- Few invasives
- Location, location
- Formerly degraded sites
- Good planning
- Patience and persistence
- Variable water levels
- Knowledge of local area
- Effective buffers
- Species diversity
- Good Management
- Ask for help early



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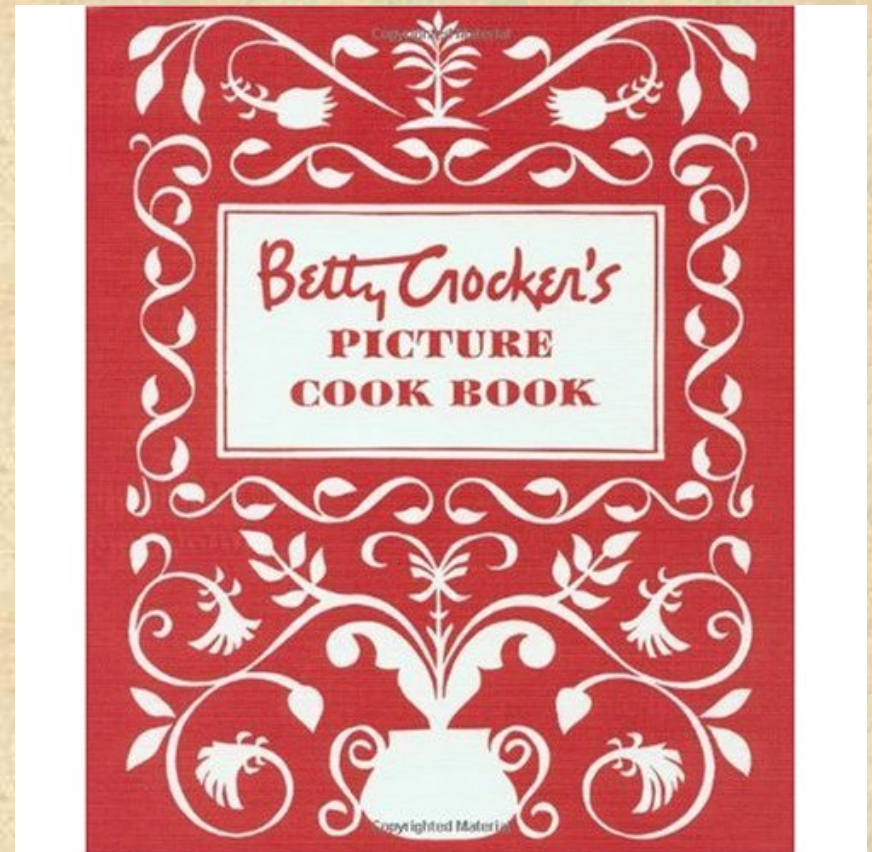


# Cookbook Basics

Guess what?  
There isn't one!

Why Not?  
Variability  
Site conditions  
Lack of information  
Different expectations

But, let's try anyway!



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# Understand Your Site

## Walkabout Sheet

Map

Water

Plants

Soils

- Wetland Walkabout Checklist
- Gather and review maps
  - Soils, air photos, drainage tile, topographic
- Gather field or guide book
  - Wetland or plant ID book
- Walk the site looking for “clues”
- Is water present?
  - When and how long?
  - Are there ponds, streams, or springs nearby?
  - Are there low spots?
  - Where are they?
  - Is there drainage such as tile or ditches?
  - Are there drowned out areas that show stress?
  - Water marks on trees or fields?
  - Is there a classic V shaped drainage indicator?
- Are there wetland plants?
  - Cattails, sedges, reed canary, flowers?
  - Shrubs or trees – dogwood, silver maples, or willow?
  - Check again for water marks
- How wet are the soils?
  - Is the color dark brown or black?
  - What does it smell like?
  - Can you roll it into a ball?
  - Can you squeeze the water out?
  - Is there decaying material?
  - Does the hole fill with water?
  - Any evidence of crayfish or invertebrates such as snails?
- Questions?
  - Use the internet
  - Contact a pro



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# Understand Your Site

## Air Photo

Large size  
Different years  
Look for “clues”  
Draw on them

## Where to get them?

Websites  
Google maps  
County GIS  
SWCD/NRCS



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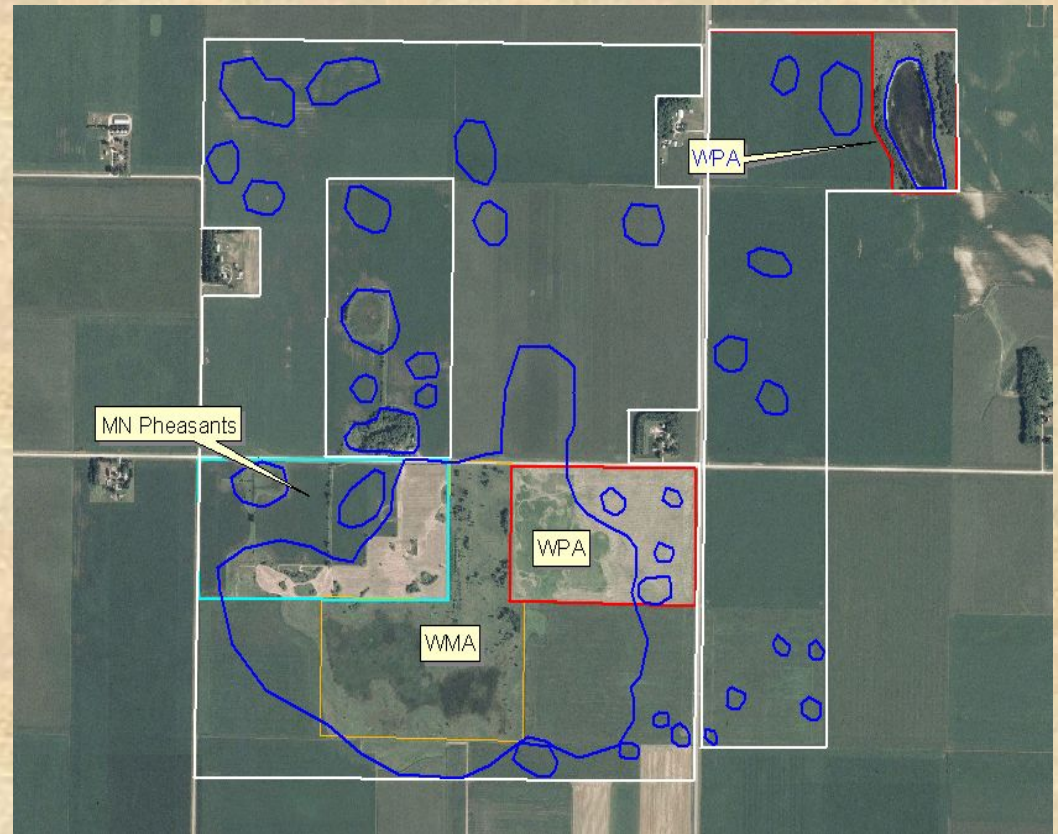
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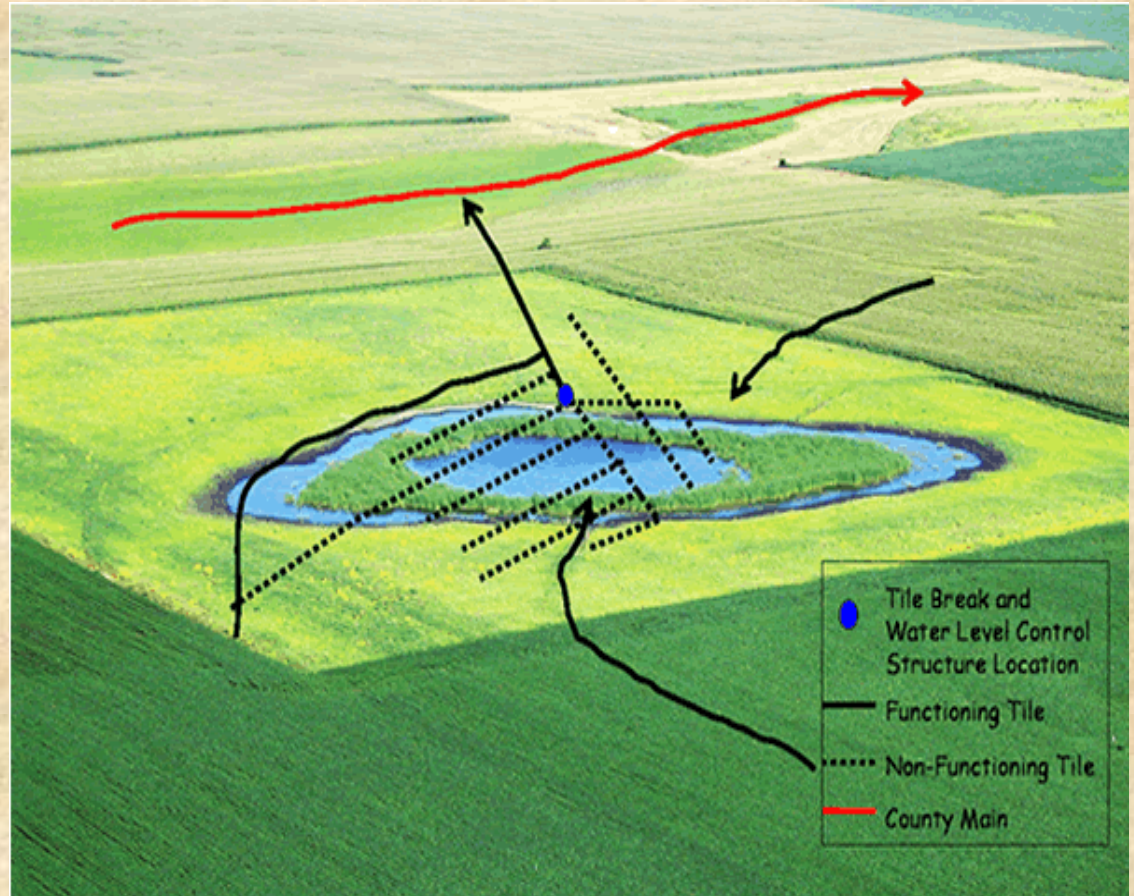


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# Understand Your Site

Drainage Patterns  
Ditches  
Tile  
Flow  
Topography  
Culverts



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# Understand Your Site

## Watershed

Size

Type

Amount of flow

Where from

Soils

Cover

Topography

Culverts



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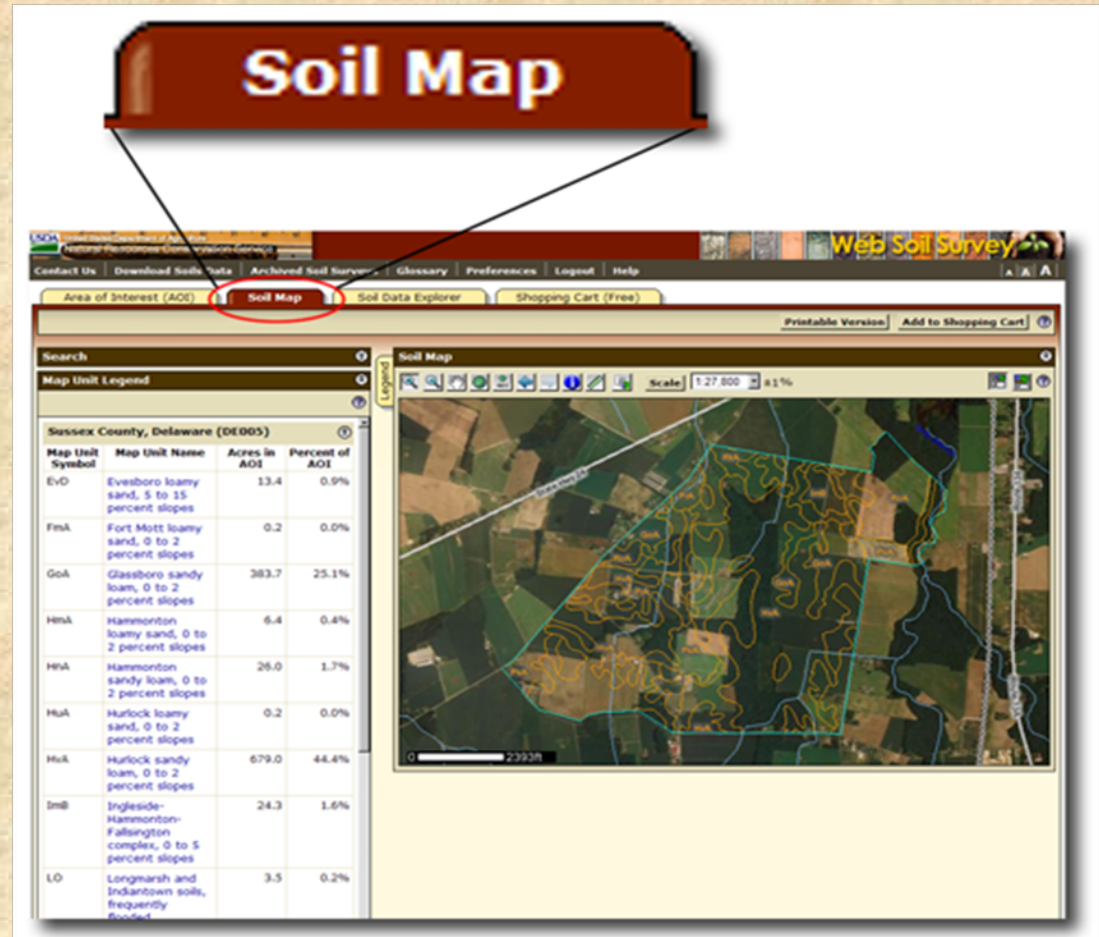




# Understand Your Site

Soils

Type  
Amount  
Wetland  
Sandy  
Sediment

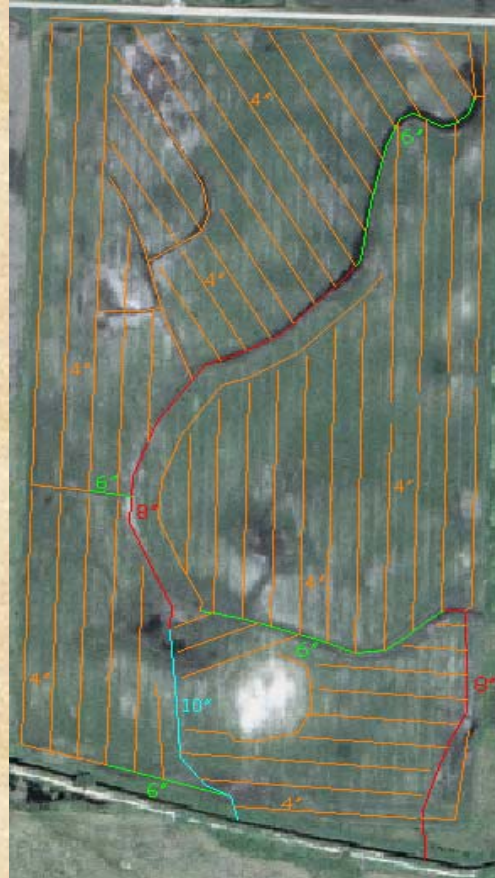


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# Understand Your Site

- Landowner interviews
- Drainage issues
- Crop issues
- Flooding issues
- Tile installation



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# Understand Your Site

## Survey

Topography  
Property lines  
Impacts  
Feasibility  
Cost vs benefit  
Borrow sites  
Design  
Engineering  
Vegetation



*(Above) Survey notes indicating elevations of land and vegetative features, estimates for earthwork, and simple drawings. (Right) Taking a shot within the basin to determine a pool elevation.*



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# Understand Your Site

Wildlife Needs

Food

Water

Cover

Space

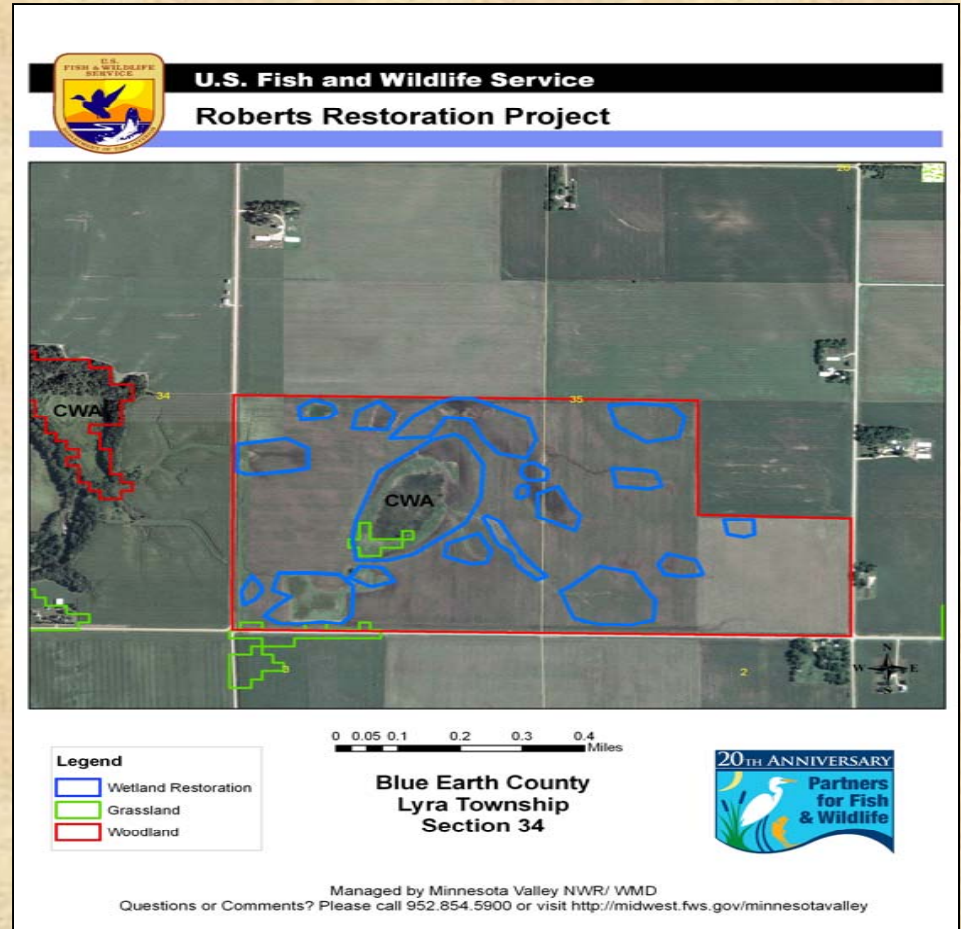
What's limiting?

Landscape potential

Seasonal needs

Annual life cycle

What can you offer?



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# Design

## Techniques

Ditch block

Tile blocks

Build berms

Shallow excavation

Riser installation

Water level control



WETLAND RESTORED (BEFORE)  
U.S. Fish and Wildlife Service



WETLAND RESTORATION (AFTER)  
U.S. Fish and Wildlife Service



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# Design

Ditch Block



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# Design

## Tile Blocks/replacement



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# Design

Build berms



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# Design

Shallow  
Excavations



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# Design

## Riser Installation



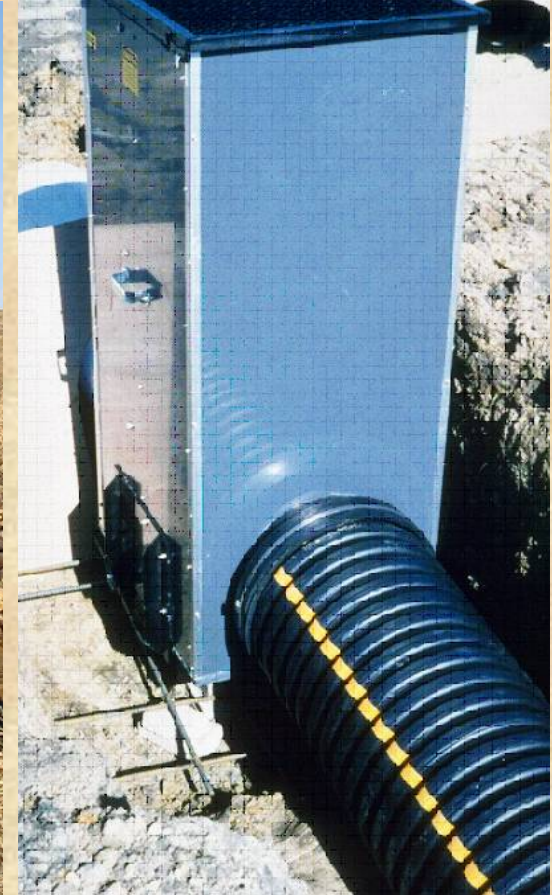
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# Design

## Water Control Structure Installation



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# Develop Project Plan

Things to consider  
Wildlife needs  
Options for project  
Costs - \$600-2,000/acre  
Budget  
Reasonable time lines  
Permits  
Contractor selection  
Seeding  
Monitoring  
Consider buffers  
Management plan

U.S. Fish and Wildlife Service  
Partners for Fish and Wildlife Program  
**PROJECT PLAN**

**I. Landowner Information:** Name: MN DNR - Diana Regenscheid  
Address: 7151 190<sup>th</sup> Street West, Room 135  
City: Jordan State: MN Zip Code: 55352  
Telephone Number: 952.492.5266 (0) (x)

**II. Description of land:**  
County: Scott Township Name: Cedar Lake Twsp: 113 Range: 22 Section: 10SW  
UTM Easting: 463921.68 UTM Northing: 4939392

**Project Type:**  Wetland: 25 acres;  Grassland: acres;  
 Instream/Fish Passage: feet or miles;  Riparian Corridor: feet  
 Sensitive and/or Rare Habitat: acres, Describe: \_\_\_\_\_  
 Other Habitat (describe): \_\_\_\_\_

Attach maps and aerial photograph

**III. Project Plan:**  
A. Description of Habitat Development or Design  
The project consists of:  
Restoring 5 wetland basins totaling 25 acres on Bradshaw Wildlife Management Area by contracting earthen dams, emergency spillways, installing a trench coated tin whistle water control structure and culverts.

The Service, or partner(s) under written agreement, will:  
- Survey the basins and design water control structures  
- Fund the cost of all materials needed for the restorations  
- Coordinate with private landowners for restoration of shared wetland basins  
- Coordinate funding, supervise contractors, and oversee entire restoration project

The Cooperator(s) will:  
- Complete SHPO and obtain all other required permits  
- Allow the USFWS periodic access to the project site to verify the dam and structure are working properly  
- Adhere to Partner agreement

**B. Description of Habitat Management Goals and Objectives for this Project:**  
Restoring the hydrology of the 5 basins within the 250 acre WMA complex will provide excellent habitat for migratory and nesting waterfowl and songbirds throughout the year.



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# Design

Things to consider

Wildlife first

Reasonable goals

Costs now and future

Management abilities



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# Construction



(Right) Clockwise from top left: (1) Seating of pipe with anti-seep diaphragm attached (2) back-filling around structure (3) view of intake and drained wetland (4) completed dam ready to be seeded.  
(Above) Same wetland 11 months later.



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# Monitoring and Habitat Management

- Walk the site
- Record journal
- Record species use
- Monitor water levels
- Water level management
- Keep an eye on dam site
- Mow for trees
- Use fire as tool
- Disking and weeding
- Other maintenance



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# Other Practices to Help You Succeed

## Plant native grass and forb buffers



**Seeding with  
Grass Drill**



**Native Grasses  
After 5 Weeks**



**Native Grasses After 1 Year (left)  
And After 3 Years (right)**



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# Other Practices for Wildlife

## Nesting Boxes, and Platforms

Waterfowl  
Warblers  
Bluebirds  
Owls  
Osprey  
Swallows  
Bats  
Martins  
Loons  
Waterbirds  
Snags



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# Case Study - St. Peter



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# St. Peter Management Plan

- Hold water until late spring (May - June)
- Slow drawdowns until bottom is exposed
- Midsummer mowing if necessary
- Disk or burn every 3-5 years
- Start slow reflooding (September – October)
- Provide 4-8 inches of water
- Design Needs?



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# Success Story

Roberts WPA

Blue Earth County

285 acre tract

Limiting factors

Species use

waterfowl

shorebirds

pheasants

songbirds

amphibians

insects



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# Success Story

Roberts WPA

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285 acre tract

Limiting factors

> 100 Species use  
waterfowl  
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insects



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# Success Story



**10 Acre Basin Restored in 2002 in Partnership with the USFWS, NRCS, Minnesota Waterfowl Assoc., Metropolitan Council and Private Landowner**



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# Confused Yet and Need Help?

Contact the Pros early on  
Who are they?  
SWCD, NRCS,  
FSA, BWSR, FWS,  
DNR

Why?  
Wetland  
Permits  
Drainage  
Local knowledge

## Wetland Contacts in Minnesota

- USFWS Offices – Partners for Fish and Wildlife Program  
[http://files.dnr.state.mn.us/assistance/grants/habitat/lessard\\_sams/usfws\\_contacts](http://files.dnr.state.mn.us/assistance/grants/habitat/lessard_sams/usfws_contacts)
- MN DNR Private Lands Offices  
<http://www.dnr.state.mn.us/privatelandprogram/index.html>
- Farm Service Agency  
<http://www.fsc.usda.gov/locator/app?state=mn&agency=fsa>
- Local Soil and Water Conservation District  
[http://www.maswcd.org/SWCDs\\_On\\_The\\_Web/swcds\\_on\\_the\\_web.htm](http://www.maswcd.org/SWCDs_On_The_Web/swcds_on_the_web.htm)
- Local NRCS Office  
<http://www.mn.nrcs.usda.gov/contact/>
- MN Department of Agriculture  
<http://www.mda.state.mn.us/protecting/conservation/practices/wetlandrest.aspx>
- MN Board of Water and Soil Resources  
<http://www.bwsr.state.mn.us/wetlands/index.html>
- Private Consultants  
Keyword wetland restoration consultants in MN



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# More Helpful Information

Your handouts – Contacts, Walkabout, and Websites

Wisconsin Wetland Restoration Handbooks for Landowners

<http://dnr.wi.gov/wetlands/handbook.html>

MN DNR Excavating Ponds for Wildlife

<http://www.dnr.state.mn.us/excavatedponds/index.html>

MN DNR Landscaping for Wildlife

[http://www.dnr.state.mn.us/eco/pubs\\_restoration](http://www.dnr.state.mn.us/eco/pubs_restoration)

MN Valley National Wildlife Refuge and WMD Partners Program

<http://www.fws.gov/midwest/minnesotavalley>

NRCS Wetland Restoration

<http://www.mn.nrcs.usda.gov/programs/wrp/plantid/about.html>

BWSR Wetland Restoration Guide

<http://www.epa.gov/wetlands/pdf/restodocfinal.pdf>



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