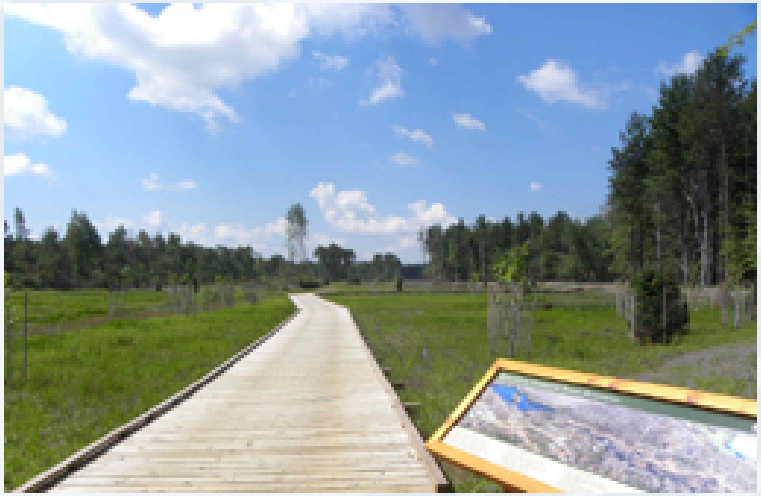
Collaborative Opportunities to Restore Wetland Functions in an Urbanized Setting: Moses Creek Restoration Case Study

2013 Award Winner



Presented to:

SER 2013 World Conference
Madison, WI

Presented by:

Jon Gumtow, PWS, PSS
Stantec Consulting Services
Green Bay, WI

October 8, 2013

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Moses Creek Restoration Partners

Schmeeckle Reserve
University of Wisconsin-Stevens Point

WISCONSIN DEPARTMENT OF TRANSPORTATION

WISCONSIN DEPT. OF NATURAL RESOURCES

Stantec

AECOM

US Army Corps of Engineers®

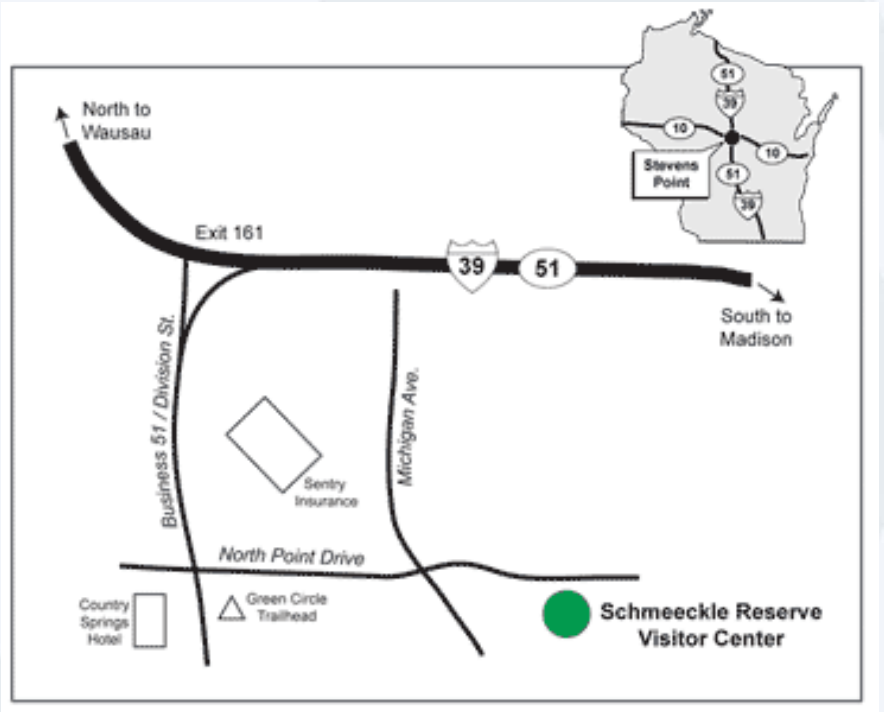
University of Wisconsin Stevens Point

QUEST Civil Engineers, LLC

Site Location

Schmeeckle Reserve

- 280-acre passive recreational and educational facility
- Operated by UWSP staff and students
- Part of 26-mile Green Circle Community Trail System
- Outdoor classroom



Introduction

- Site History
- Project Objectives
- Project Approach
- Restoration Success

History: Pre-European Settlement

Geology

- Part of Glacial Lake Wisconsin 10,000 years ago

Soils

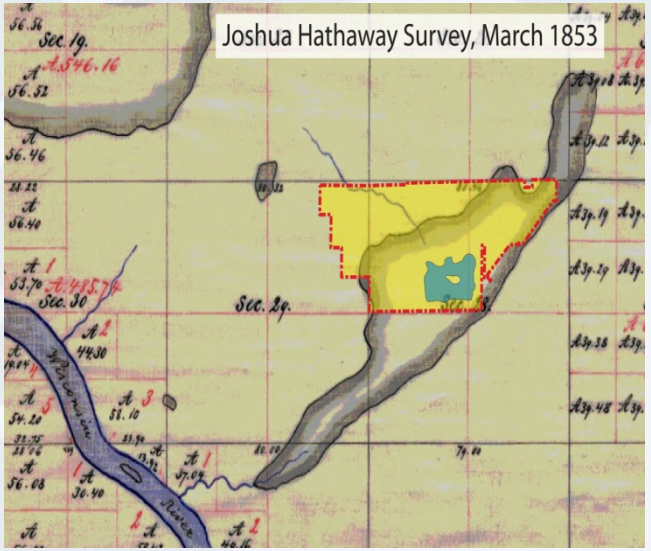
- Roscommon Muck – organic soil over sand

Vegetation

- Sedges, grasses, and marsh vegetation

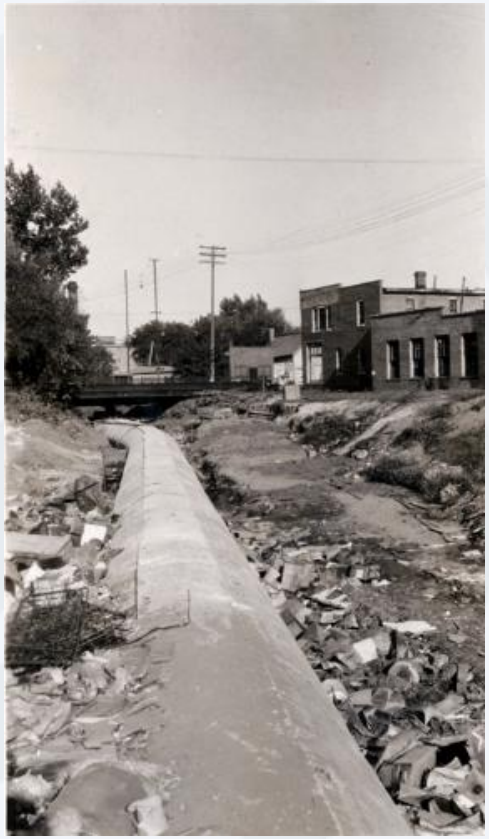
Survey Notes

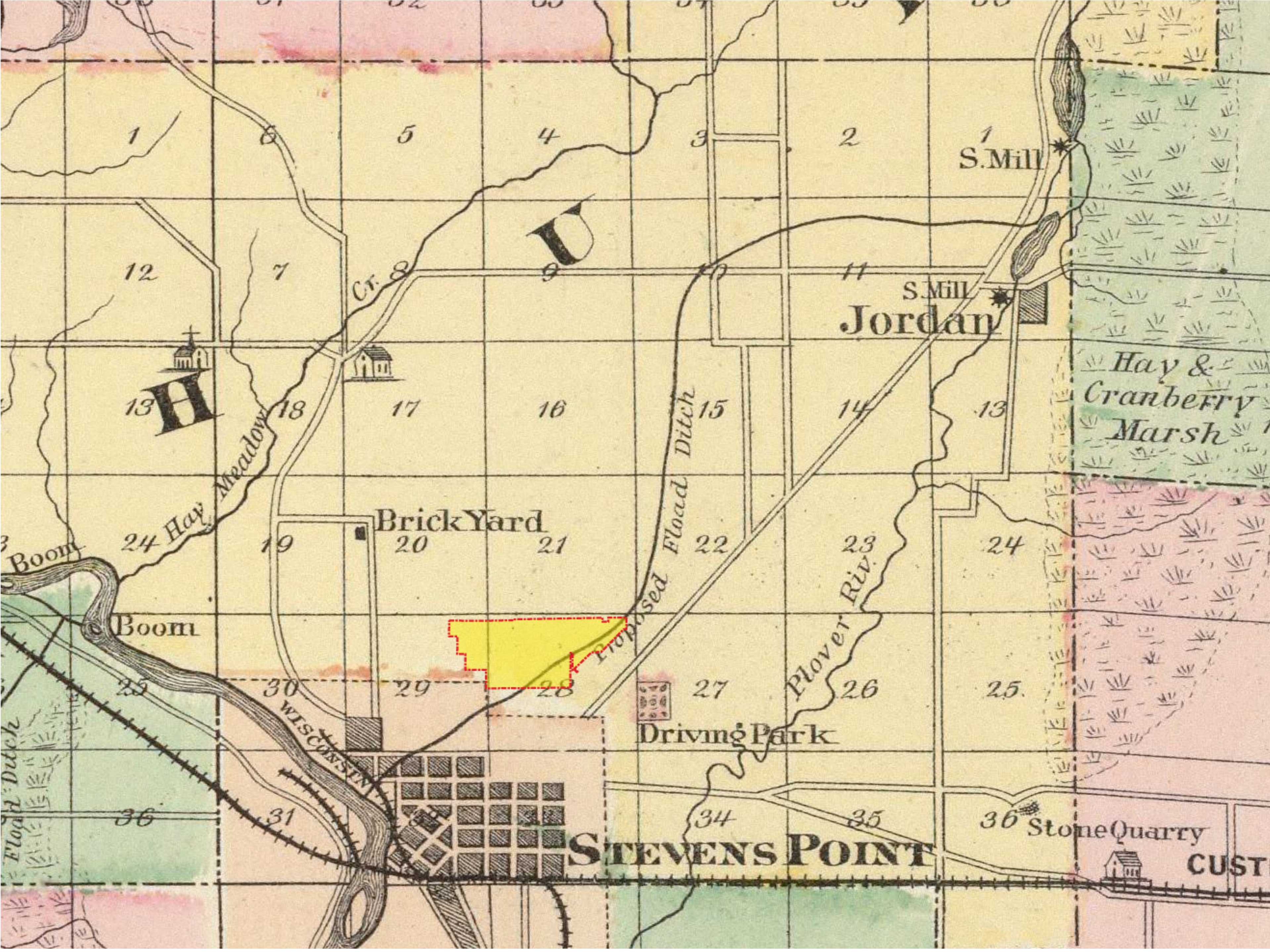
- Described as “marsh”
- No stream history



History: Post-European Settlement

- Farm ditching/drainage
- Flood and Storm water Control
- Lower 1.3 miles piped to the Wisconsin River





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S. Mill
Jordan
Hay & Cranberry Marsh
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Hay Meadow
Brick Yard
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20
21
Proposed Flood Ditch
22
23
24
Boom
Boom
Plover Riv.
25
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25.
WISCONSIN
Driving Park
Flood Ditch
36
31
34
35
36
Stone Quarry
STEVENS POINT
CUST

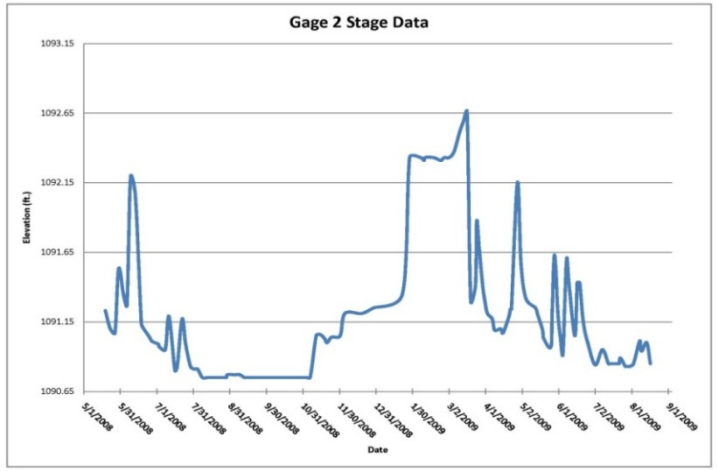
Site Conditions: Pre-Restoration

Channelized Ditch

- Separated from floodplain
- Adjacent habitats
  - Drained wetlands
  - Early succession forest
  - Glossy Buckthorn
- Low aquatic habitat value

Hydroperiod

- Intermittent flow regime
- Supplied by shallow groundwater
- Dries in late summer
- Early spring flooding
  - Ice dams



Project Objectives and Opportunities

- Habitat Restoration
  - Maximize wetland restoration acreage - riparian wet meadow and tall shrub plant communities
  - Naturalize Moses Creek channel within Schmeeckle Reserve
  - Improve flood control by reconnecting creek to wetlands
  - Maintain drainage to adjacent properties
- Public Involvement/Education
  - Create opportunity for UWSP to incorporate into classroom curricula
  - Educate public about habitat restoration
  - Improve trail user experience
  - Create a trail destination

Project Approach: Public Involvement/Education

- Local Citizens
  - Public Info Meetings
  - Open Houses
  - Communication with adjacent land owners
  - Presentations to Stevens Point city officials
- UWSP and WRA
  - College and High School Student Involvement
  - Serve as an outdoor classroom
  - Research/Monitoring

Project Approach: Baseline Studies

- Soils
  - Drained Hydric Soils
  - Top Soil Depths
- Hydrology
  - Monitoring Well & Gage Data
- Vegetation
  - Community Mapping
  - Comprehensive Surveys
- Wetland Delineation
- Reference Site
  - Wetland and Stream

Baseline Study Results

Hydrology Results

- 2 Year monitoring period
  - Observations made 3 times/week
  - UWSP Students
- Well data indicate ground water flows south across site
  - May-June Median groundwater: 1091.0 east and 1089.5 central
  - May-June Median stream stage: 1091.0 east and 1086.5 west
- Stream gage data shows strong groundwater correlation

Baseline Study Results

Stream Assessment Results

- No stream history
- Intermittent flows
- Trapezoidal dug channel
- No connection to other waterways
- Debris dams
- Ave. Width: 5 feet / Depth: 3 inches
- Low aquatic value

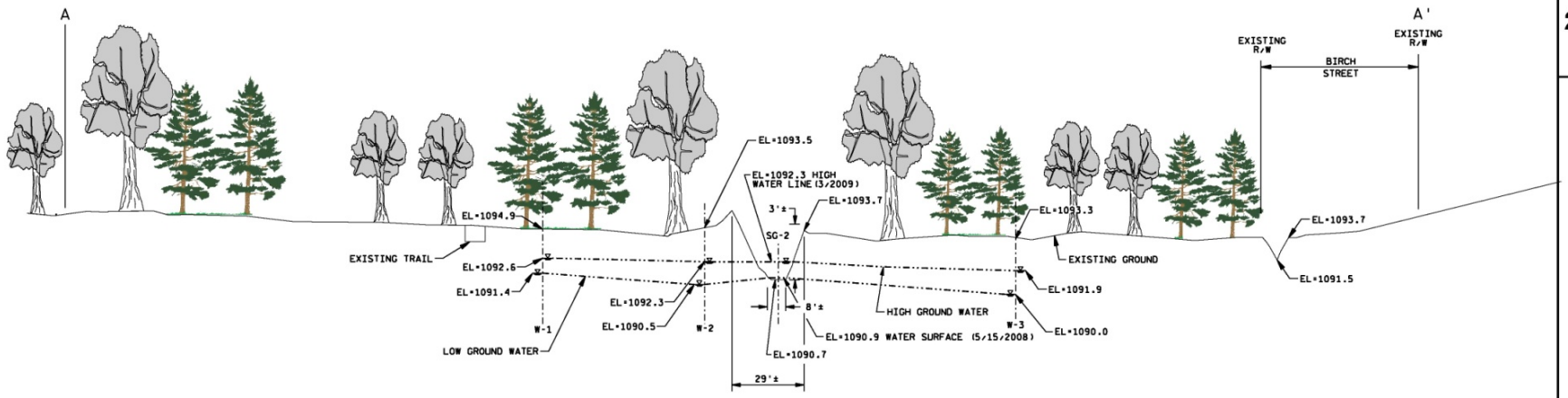
Baseline Study Results

Vegetation Results

- 14 stands comprised of 9 different communities
- Exotic species infestations
  - Glossy Buckthorn and Reed Canary Grass

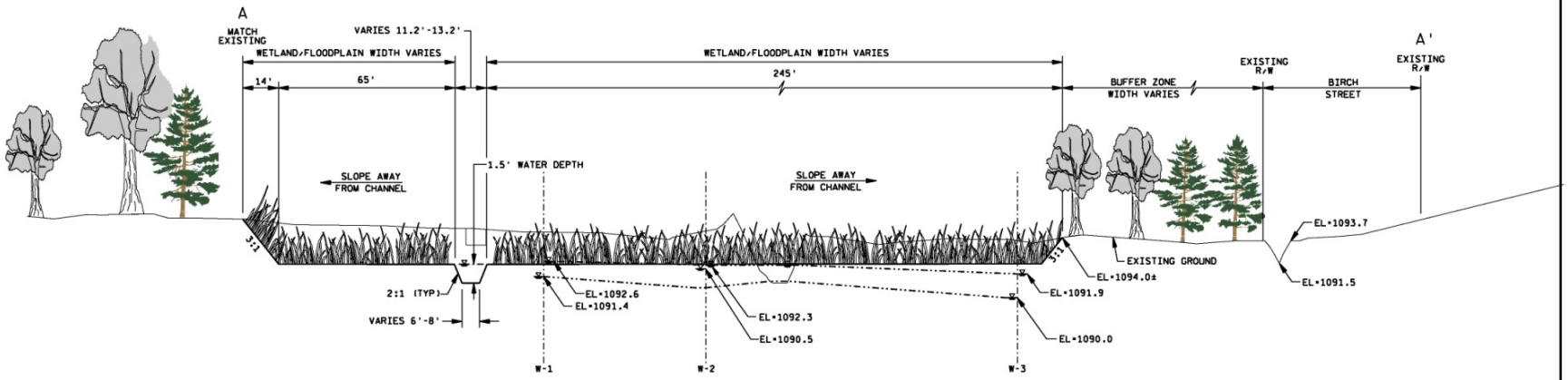
Design: Uniting Baseline Studies and Public Use

- Restore 20 acre riparian meadow and shrub communities
- Naturalize 4,300 linear feet of Moses Creek
- Invasive species control within 300 ft buffer (20 acres)
- Channel and floodplain design to improve flood control
- Incorporate student involvement and curriculum
- Provide public access with 1.5 mile trail/boardwalk
- Enable educational opportunities (signage, website, kiosk)



TYPICAL EXISTING DITCH SECTION - A - A'

NTS



TYPICAL FINISHED DITCH SECTION - A - A'

NTS

PROJECT NUMBER: 6351-01-74	HWY: MOSES CREEK MITIGATION	COUNTY: PORTAGE	TYPICAL SECTIONS	SHEET	E

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WISDOT/CADDS SHEET 42


Schmeeckle Reserve
woodlands
Lake Joanis
LAKE WETLAND
RESTORATION AREA
2 acres
Upland
plantings
Scrape
Tree plantings
Scrape
Crossing Trail
Boardwalk
Moses Creek
main channel
MAIN WETLA
Milano and Sciarrone
Crossing Bridge
Residential Area
Moses Creek
main channel
South Fork
channel
Tree
islands
Residential Area
Residential Area
Residential Area
Indiana Ave.
Schmeeckle Reserve
woodlands
North Point Drive
Berard Oaks
Savanna
Upland
plantings
Scrape
Tree plantings
Crossing Trail
Boardwalk
Moses Creek
main channel
MAIN WETLAND RESTORATION AREA
15 acres
Milano and Sciarrone
Crossing Bridge
South Fork
channel
Green Circle
Boardwalk
Green Circle
Boardwalk
Tree
islands
Scrapes
Residential Area
Residential Area
Tree island
Indiana Ave.
Birch St.

Project Status

- Excavation/earthwork completed in Fall 2010.
  - Creation of new stream channels, filling of old channel, creation of floodplain, scrapes
- 3 years of monitoring indicates hydrology has been restored per design
- Revegetation Success:
  - Wet Meadow
  - Prairie
  - 360 trees/shrubs
  - Removal of invasive species

Design Goals: Measuring Success

Vegetation Surveys 2011 to 2013

- Increase from 36 to 65 species
- FQI 13.6 (3 exotic sp.)
- Carex and Juncus dominant

Seed Bank Study

- 19 species not seeded
- 1,300 seeds/sq. meter
- Low N and C soils values

	Symbol	Scrape A	Scrape B	Scrape C	Scrape D	Status
Rice Cutgrass	LEOR	11.07%	2.1%	X	X	OBL
Common/Soft Rush	JUEF	1.958%	5.83%	9.61%	1.35%	OBL
Carex spp.	Carex	0.128%	0.14%	X	X	OBL
Bulrush	SCTA2	17.475%	8.64%	14.49%	X	
W. Berganon	MOFI	0.24%	X	X	X	FACU
Cat tail	TYPHA	32.59%	44.19%	8.9%	X	OBL
Spike Rush	ELPA3	22.75%	X	3.84%	2.37%	OBL
Unknown		1.235%	X	0.08%	X	
Torrey's rush	JUTO	1.94%	0.9%	0.19%	X	FACW
Hairy panic Grass	DIACF	2.99%	0.24%	X	X	FAC
Grass-leaved goldenrod	EUGPG	0.058%	X`	X	X	FACW
Wool grass	SCCCY	X	0.36%	X	X	OBL
Slender rush	JUTE	X	X	0.24%	X	FAC
Mud Plantain	ALSU	22.02%	8.73%	11.34%	10.65%	OBL

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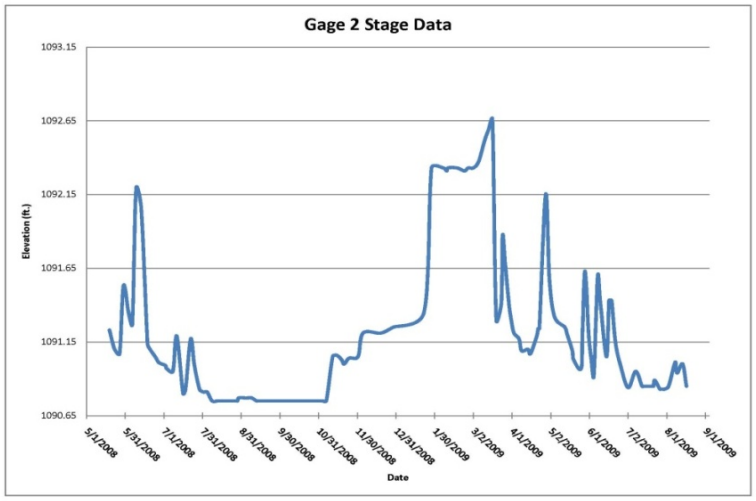
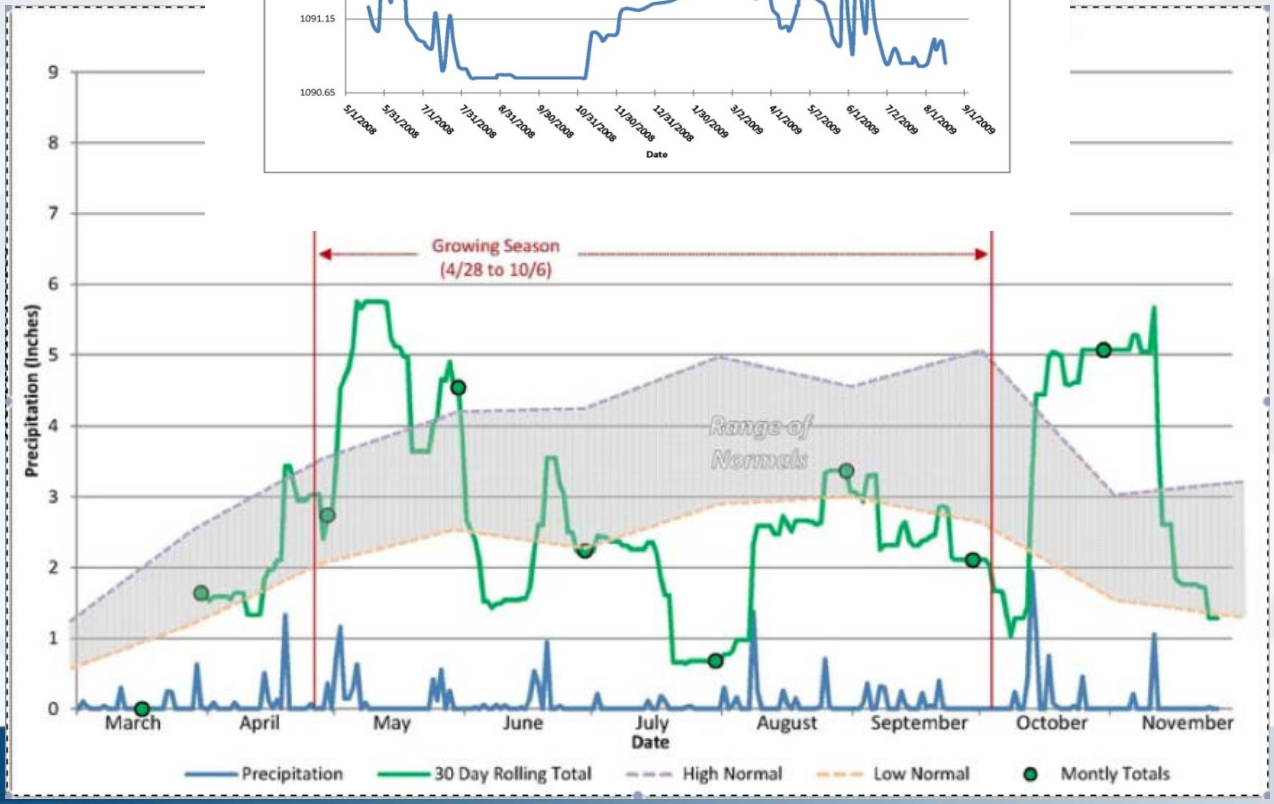
Design Goals: Measuring Success

Groundwater





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Keys to Project Success

- Multidisciplinary technical team
- Multi-year baseline studies
- Salvaged topsoil with viable seed bank
- Project vision from WisDOT, UWSP, City, WDNR, and USACE
- Public outreach/education (pre and post construction)

Thank You

2013 Award Winner