

Wisconsin Department of Natural Resources SWIMS Project Summary

General Project Information

- Project ID:** NOR_06_CMP14
- Name:** Crex Meadows Water Quality Assessment - NOR_06_CMP14
- Type:** Competitive Projects
- Subtype:** Evaluation Monitoring
- Status:** COMPLETE
- Start Date:** 01/01/2014
- End Date:** 12/31/2014
- Purpose:** Crex Meadows Wildlife Area is located in Burnett County north of Grantsburg. Since 1945, the DNR has constructed more than 18 miles of dikes to restore 15,000 acres of wetland wildlife habitat and 5,000 acres of deepwater marshes. Drainage flows to the south via 3 tributaries to the North Fork Wood River and Wood River. The Wood River drains to the St. Croix River which is a National Wild and Scenic River. Lake St. Croix is located downstream. A TMDL project is underway for the Lake St. Croix watershed. Wisconsin and Minnesota are working cooperatively on the project with a goal of improving water quality, and especially reducing phosphorus loading. The DNR and Burnett County LWCD receive inquiries about high turbidity caused by iron floc (iron hydroxide) in waters downstream of Crex Meadows. Turbidity plumes are often present at the mouth of the Wood River and into the St. Croix River. Crex Meadows is located in an area with naturally occurring iron deposits. Water level manipulations, including periodic draining and filling of flowages have resulted in mobilization of iron, which is sensitive to oxidation/reduction cycling. Groundwater data from a USGS study shows that groundwater iron concentrations downgradient of the flowages can be 18 times higher than upgradient of the flowages (see attached report). Phosphorus export may also be a concern because phosphorus is often mobilized along with iron. One sample of flowage discharge had a TP concentration of 163 ug/l. This project will: 1. Assess iron distribution and transport . 2. Establish a baseline for the current quality of water discharges. 3. Explore management options that could improve downstream water quality. Monitoring will be conducted in 2014. Craig Roesler will be the lead staff person.
- Objective:** Local water quality impacts include iron floc turbidity, phosphorus export and biological impairments. This project may identify management options within the watershed that can improve downstream water quality. A targeted watershed assessment will be coupled with this project to provide biological data for the receiving streams. Three discharge streams will be monitored - Hay Ck, 2643000; Whiskey Ck, 2646600; Unnamed trib, 2647100. Flowages that may be monitored include - Phantom Flowage, 2144100; North Fork Flowage, 2647300; South Refuge Flowage, 2644400; Upper North Fork Flowage, 2648900; Middle North Fork Flowage, 7215114; Dike 4 Flowage, 2645400; Dike 6 Flowage, 2643100. Up to 20 sites may be sampled for soil iron concentrations. Up to 15 additional surface drainageways may occasionally be sampled. The property manager and staff will be consulted to help identify suitable sites. SWIMS station numbers are TBD.
- Comments:** New(?), although it is the next step following last year's project that monitored the Wood River as part of the Lake St. Croix watershed TMDL effort.
- Outcome:** The project will: 1. Describe iron distribution and transport. 2. Establish a baseline for the current quality of water discharges. 3. Explore management options that could improve downstream water quality. The project will contribute to Wisconsin's efforts towards the Lake St. Croix watershed TMDL. A report of findings will be prepared and entered into SWIMS. Management options will presumably be implemented in future years. The potential to rely heavily on transparency measurements may minimize future monitoring costs to evaluate effectiveness of practices.
- Study Design:** Soils will be tested to determine the mass and distribution of iron, since this is the source of iron in the system. 30 soil samples will be tested for particle size, TOC, iron, and bulk density. Soil profiles will be examined to see how iron re-distributes with water level fluctuations. Water released from the flowages will be tested at the 3 stream sites (in Project Objective) on 12 dates for TP,TSS, turbidity, color, and iron. Field tests will include D.O., temp, transparency, pH, conductivity, and flow. Water in 8 flowages will be tested once in late winter and once in late summer for TP and Fe. Field tests will include D.O., temp, transparency, pH, and conductivity. Summer sediment samples will be tested in 8 flowages for % solids, % volatile solids, TP, iron, and particle size. Twenty-five samples will be collected for misc. surface flows (upgradient of flowages and "background" sites) and tested for TP and Fe. Field tests will include D.O., temp, transparency, pH, and conductivity.
- QA Measures:** Standard DNR protocols will be followed for sample collection. The SLOH provides QA for lab samples.

People

Name	Role	Status	Start Date	End Date	Organization	Comments
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Wisconsin Department of Natural Resources SWIMS Project Summary

Name	Role	Status	Start Date	End Date	Organization	Comments
CUNNINGHAM, JOSEPH L	COORDINATOR	ACTIVE	01/01/2014	12/31/2014	Wisconsin DNR	
HAGEN, CHERIE L	SUPERVISOR	ACTIVE	12/23/2013	12/31/2014	Wisconsin DNR	
OLSON, FLORENCE A	COORDINATOR	ACTIVE	01/01/2014	12/31/2014	Wisconsin DNR	
PEACHER, RACHEL D	COORDINATOR	ACTIVE	01/01/2014	12/31/2014	Wisconsin DNR	
Roesler, Craig P	PROJECT_LEAD	ACTIVE	01/01/2014	12/31/2014	Wisconsin DNR	

Project Statuses

Date	Reported By	Status	Comments
12/16/2013	Craig Roesler	Proposed	
05/13/2014	Craig Roesler	Progress: 0-25% Complete	on schedule
11/25/2014	Craig Roesler	Progress: 75-100% Complete	Most field work done. Planned flowage samples still need to be collected in February or March of 2015. Preliminary report will be completed prior to spring of 2015. Report will be finalized when macroinvertebrate sample results are received from UW Stevens Point.
03/02/2016	Craig Roesler	Complete	

Project Status Detail

Answer Set: DEFAULT

Question	Answer
1. Number of Sample Sites (Enter the station IDs if you know them).	~30
2. Number of Sample Events (Indicate how many trips into the field you anticipate for this project).	18
3. Proposed Dates for Sample Collection	Feb 2014 - Nov 2014
4. List applicable databases and who will enter data?	SWIMS; Craig Roesler
5. Did you receive competitive projects funding in the previous year?	Yes
6. If yes to question 5, did you complete the projects including data entry and reports as necessary? If not, why not?	Projects are completed to extent possible.
7. Reviewer Notes: Identify questions or issues with project (use during review period)	
8. Reviewer Decision: Is this project recommended for funding?	

Actions

Action	Detailed Description	Start	End Date	Status
Monitor or Assess Water/shed Condition		*****	12/31/2014	PROPOSED

Monitoring Stations

Station ID	Name	Comments
10042158	(Buggert Creek) @ Buggert Lake Rd.	
10042342	East ditch to N. Fk. Creek at Lundquist Rd	
10042116	East spring at iron deposition area	
10042427	Ekdall Creek 5 m above mouth	
10041942	Hay Creek 10m west of CTH F	
10042732	Hay Creek Flowage (outlet end)	
10042676	Hay Creek Flowage at outlet	

Wisconsin Department of Natural Resources SWIMS Project Summary

Station ID	Name	Comments
10042155	Iron spring @ Norway Point	
10042677	Lower L Dike	
10042731	Lower L Dike along CTH F	
10042728	North Fork Flowage	
10042682	North Fork Flowage near outlet	
073114	North Fork Wood River at Cth D Lower Crossing	
10042678	Phantom Flowage	
10042733	Phantom Flowage near 3 tube outlet	
10042679	Phantom Flowage near SE corner	
10042734	Phantom Flowage near east 1 tube outlet	
10042730	Rice Lake	
10042680	Rice Lake near center	
10042154	Sandstone spring @ Norway Point	
10042729	South Refuge Flowage near Main Dyke Rd	
10042681	South Refuge Flowage near outlet	
10042157	Unnamed (Kylingstad) Creek at North Fork Dike Rd	
10042969	Unnamed (North Fork Ck.) stream 160 m DS of North Fork Flowage	
10041943	Unnamed stream 10m DS of Lundquist Rd.	
10042446	Unnamed stream 37 m DS North Fork Dike Rd	
10042444	Unnamed stream near Bang Rd	
10042443	Unnamed stream near Nordstrum Rd	
10042727	Upper North Fork Flowage	
10042683	Upper North Fork Flowage	
10042343	West ditch to N. Fk. Creek at Lundquist Rd	
10042117	West spring at iron deposition area	
10037789	Whiskey Creek 110m DS CTH D	
10042994	Wood River 427m DS STH 70 (first crossing)	
10042968	Wood River 460 m DS STH 70 second crossing	
073115	Wood River North Fork - Upper Cth D Xing	
073109	Wood River at Hwy 70 W Of Alpha	

Assessment Units

WBIC	Segment	Local Name	Official Name
2601400	4	St. Croix River	Saint Croix River
2642900	2	Wood River	Wood River
2643000	2	Hay Creek	Hay Creek
2643100	1	Local Water	Unnamed
2644100	1	Phantom Flowage T39n R19w S36	Phantom Flowage T39n R19w S36
2644200	1	Phantom L. Bypass	Phantom Lake Bypass
2645900	1	Rice Lake	Rice Lake
2646600	1	Whiskey Creek	Whiskey Creek
2647000	1	North Fork Wood River	North Fork Wood River
2648700	1	Local Water	Unnamed
2653300	1	Ekdall Brook	Ekdall Brook
2653400	1	Buggert Lake	Buggert Lake
5003911	1	Local Water	Unnamed
5004166	1	Local Water	Unnamed

Wisconsin Department of Natural Resources SWIMS Project Summary

Lab Account Codes

Account Code	Description	Start Date	End Date
WT161	EVALUATION MONITORING	05/10/2012	12/31/2014

Forms

Form Code	Form Name
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Methods

Method Code	Description
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Fieldwork Events

Start Date	Status	Field ID	Station ID	Station Name
04/11/2014 13:00	COMPLETE	HD-3	10041942	Hay Creek 10m west of CTH F
04/11/2014 14:00	COMPLETE	NF-1	10041943	Unnamed stream 10m DS of Lundquist Rd.
04/11/2014 15:00	COMPLETE	WC-2	10037789	Whiskey Creek 110m DS CTH D
05/07/2014 13:00	COMPLETE	SPE-1	10042116	East spring at iron deposition area
05/07/2014 13:15	COMPLETE	SPW-2	10042117	West spring at iron deposition area
05/14/2014 09:00	COMPLETE	NF-1	10041943	Unnamed stream 10m DS of Lundquist Rd.
05/14/2014 10:00	COMPLETE	WH-2	10037789	Whiskey Creek 110m DS CTH D
05/14/2014 11:00	COMPLETE	HA-3	10041942	Hay Creek 10m west of CTH F
05/14/2014 12:15	COMPLETE	SSP-4	10042154	Sandstone spring @ Norway Point
05/14/2014 13:00	COMPLETE	ISP-5	10042155	Iron spring @ Norway Point
05/14/2014 13:30	COMPLETE	BU-7	10042158	(Buggert Creek) @ Buggert Lake Rd.
05/14/2014 14:30	COMPLETE	KY-6	10042157	Unnamed (Kylingstad) Creek at North Fork Dike Rd
05/31/2014 10:00	COMPLETE	NF-1	10041943	Unnamed stream 10m DS of Lundquist Rd.
05/31/2014 11:00	COMPLETE	WH-2	10037789	Whiskey Creek 110m DS CTH D
05/31/2014 11:45	COMPLETE	HA-3	10041942	Hay Creek 10m west of CTH F
06/01/2014 00:45	COMPLETE		10041942	Hay Creek 10m west of CTH F
06/01/2014 00:46	COMPLETE		10041943	Unnamed stream 10m DS of Lundquist Rd.
06/16/2014	COMPLETE	HA-4	10041942	Hay Creek 10m west of CTH F
06/16/2014 09:00	COMPLETE	KY-1	10042157	Unnamed (Kylingstad) Creek at North Fork Dike Rd
06/16/2014 10:00	COMPLETE	NF-2	10041943	Unnamed stream 10m DS of Lundquist Rd.
06/16/2014 11:00	COMPLETE	WH-3	10037789	Whiskey Creek 110m DS CTH D
06/26/2014 10:00	COMPLETE	HA-1	10041942	Hay Creek 10m west of CTH F
06/26/2014 10:30	COMPLETE	KY-6	10042157	Unnamed (Kylingstad) Creek at North Fork Dike Rd
06/26/2014 10:30	COMPLETE	WH-2	10037789	Whiskey Creek 110m DS CTH D
06/26/2014 11:00	COMPLETE	NF-3	10041943	Unnamed stream 10m DS of Lundquist Rd.
06/26/2014 13:45	COMPLETE	NFWD-4	10042343	West ditch to N. Fk. Creek at Lundquist Rd
06/26/2014 14:00	COMPLETE	NFED-5	10042342	East ditch to N. Fk. Creek at Lundquist Rd
07/11/2014 09:00	COMPLETE	WO-10	073109	Wood River at Hwy 70 W Of Alpha
07/11/2014 09:30	COMPLETE	NFW-11	073115	Wood River North Fork - Upper Cth D Xing
07/11/2014 10:00	COMPLETE	KY-12	10042157	Unnamed (Kylingstad) Creek at North Fork Dike Rd
07/11/2014 10:30	COMPLETE	NF-13	10041943	Unnamed stream 10m DS of Lundquist Rd.
07/11/2014 11:00	COMPLETE	HA-15	10041942	Hay Creek 10m west of CTH F
07/11/2014 11:00	COMPLETE	WH-14	10037789	Whiskey Creek 110m DS CTH D
07/11/2014 11:30	COMPLETE	EK-16	10042427	Ekdall Creek 5 m above mouth
07/15/2014 10:00	COMPLETE	UNN-1	10042443	Unnamed stream near Nordstrum Rd
07/15/2014 13:00	COMPLETE	UNB-2	10042444	Unnamed stream near Bang Rd
07/17/2014 12:10	COMPLETE	UND-6	10042446	Unnamed stream 37 m DS North Fork Dike Rd

Wisconsin Department of Natural Resources SWIMS Project Summary

Start Date	Status	Field ID	Station ID	Station Name
07/25/2014	COMPLETE	NF-5	10041943	Unnamed stream 10m DS of Lundquist Rd.
07/25/2014	COMPLETE	WH-3	10037789	Whiskey Creek 110m DS CTH D
07/25/2014 10:00	COMPLETE	HAF-2	10041942	Hay Creek 10m west of CTH F
07/25/2014 13:00	COMPLETE	KY-6	10042157	Unnamed (Kylingstad) Creek at North Fork Dike Rd
07/25/2014 14:30	COMPLETE	SA-7	10042446	Unnamed stream 37 m DS North Fork Dike Rd
08/20/2014 10:00	COMPLETE	WO-1	073109	Wood River at Hwy 70 W Of Alpha
08/20/2014 10:30	COMPLETE	NFW-2	073115	Wood River North Fork - Upper Cth D Xing
08/20/2014 11:00	COMPLETE	NFC-3	10041943	Unnamed stream 10m DS of Lundquist Rd.
08/20/2014 11:30	COMPLETE	SA-4	10042446	Unnamed stream 37 m DS North Fork Dike Rd
08/20/2014 13:00	COMPLETE	WH-5	10037789	Whiskey Creek 110m DS CTH D
08/20/2014 14:00	COMPLETE	HA-6	10041942	Hay Creek 10m west of CTH F
09/02/2014 10:00	COMPLETE	SA-1	10042446	Unnamed stream 37 m DS North Fork Dike Rd
09/02/2014 10:30	COMPLETE	NF-2	10041943	Unnamed stream 10m DS of Lundquist Rd.
09/02/2014 11:00	COMPLETE	WH-3	10037789	Whiskey Creek 110m DS CTH D
09/02/2014 13:00	COMPLETE	HA-4	10041942	Hay Creek 10m west of CTH F
09/15/2014 10:00	COMPLETE	NF-1	10041943	Unnamed stream 10m DS of Lundquist Rd.
09/15/2014 11:00	COMPLETE	WH-2	10037789	Whiskey Creek 110m DS CTH D
09/15/2014 11:45	COMPLETE	HA-3	10041942	Hay Creek 10m west of CTH F
09/18/2014 10:00	COMPLETE	HC-1	10042676	Hay Creek Flowage at outlet
09/18/2014 10:30	COMPLETE	LD-2	10042677	Lower L Dike
09/18/2014 11:00	COMPLETE	P3-3	10042678	Phantom Flowage
09/18/2014 11:30	COMPLETE	P1-4	10042679	Phantom Flowage near SE corner
09/18/2014 12:10	COMPLETE	RI-5	10042680	Rice Lake near center
09/18/2014 13:00	COMPLETE	SR-6	10042681	South Refuge Flowage near outlet
09/18/2014 13:30	COMPLETE	NF-7	10042682	North Fork Flowage near outlet
09/18/2014 14:00	COMPLETE	UN-8	10042683	Upper North Fork Flowage
09/23/2014 10:00	COMPLETE	HA-6	10042732	Hay Creek Flowage (outlet end)
09/23/2014 10:00	COMPLETE	LL-5	10042731	Lower L Dike along CTH F
09/23/2014 10:00	COMPLETE	NF-2	10042728	North Fork Flowage
09/23/2014 10:00	COMPLETE	P1-8	10042734	Phantom Flowage near east 1 tube outlet
09/23/2014 10:00	COMPLETE	P3-7	10042733	Phantom Flowage near 3 tube outlet
09/23/2014 10:00	COMPLETE	RI-4	10042730	Rice Lake
09/23/2014 10:00	COMPLETE	SR-3	10042729	South Refuge Flowage near Main Dyke Rd
09/23/2014 10:00	COMPLETE	UN-1	10042727	Upper North Fork Flowage
09/24/2014 10:00	COMPLETE	HA-1	10041942	Hay Creek 10m west of CTH F
09/24/2014 11:00	COMPLETE	WH-2	10037789	Whiskey Creek 110m DS CTH D
09/24/2014 11:30	COMPLETE	NF-3	10041943	Unnamed stream 10m DS of Lundquist Rd.
10/09/2014 10:00	COMPLETE	WO-1	073109	Wood River at Hwy 70 W Of Alpha
10/20/2014 11:00	COMPLETE	NF-2	073115	Wood River North Fork - Upper Cth D Xing
10/20/2014 12:30	COMPLETE	HA-1	10041942	Hay Creek 10m west of CTH F
10/20/2014 13:00	COMPLETE	WH-2	10037789	Whiskey Creek 110m DS CTH D
10/20/2014 13:30	COMPLETE	NF-3	10041943	Unnamed stream 10m DS of Lundquist Rd.
12/05/2014 09:00	COMPLETE	NC-1	10042428	Unnamed stream 155 m DS North Rd
12/05/2014 09:30	COMPLETE	NF-2	10041943	Unnamed stream 10m DS of Lundquist Rd.
12/05/2014 10:00	COMPLETE	WH-3	10037789	Whiskey Creek 110m DS CTH D
12/05/2014 10:30	COMPLETE	HA-4	10041942	Hay Creek 10m west of CTH F
12/05/2014 11:00	COMPLETE	IR-5	10042377	Iron Creek 124 m DS Sadlers Rd
12/05/2014 12:05	COMPLETE	NO-6	10042443	Unnamed stream near Nordstrum Rd

Wisconsin Department of Natural Resources SWIMS Project Summary

Start Date	Status	Field ID	Station ID	Station Name
12/05/2014 12:30	COMPLETE	EK-7	10042427	Ekdall Creek 5 m above mouth
03/02/2015 10:00	COMPLETE	UNF-1	10042683	Upper North Fork Flowage
03/02/2015 11:00	COMPLETE	NF-2	10042682	North Fork Flowage near outlet
03/02/2015 12:10	COMPLETE	PF1T-4	10042679	Phantom Flowage near SE corner
03/02/2015 13:00	COMPLETE	PF3T-5	10042678	Phantom Flowage
03/02/2015 14:00	COMPLETE	RI-6	10042680	Rice Lake near center

Documents

Title	Description	Author	Published	Comments
Crex Fish Data, appendix 4		Craig Roesler	02/26/2016	
Crex Flowage Sediment Data, appendix 3		Craig Roesler	02/26/2016	
Crex Meadows Wildlife Area Water Quality Assessment		Craig Roesler, Rachel Peacher, Tim Parks	02/26/2016	
Crex Meadows Wildlife Area Water Quality Concerns		Craig Roesler	03/24/2014	
Crex Soils Data, appendix 1		Craig Roesler	02/26/2016	
Crex Water Quality Data, appendix 2		Craig Roesler	02/26/2016	

Budget

Budget Description:Jan 2014 - June 2014 **Start Date:** **End Date:**

Code	Description	Quantity	Units	Unit Cost	Total Cost	Comments
FTE	FTE Hours	90	Hours	\$0.00	\$0.00	
LTE SAL	LTE Salary	72	Hours	\$13.00	\$936.00	
LTE FR	LTE Fringe				\$231.19	
LTE IND	LTE Indirect				\$188.73	
LTE TOT	LTE Total Cost				\$1,355.93	
SUPPLY	Supplies	8		\$25.00	\$200.00	shipping
EQUIP	Equipment	1		\$210.00	\$210.00	transparency tubes and misc.
MILEAGE	Mileage	2280	Miles	\$0.53	\$1,208.40	
MEAL	Meals	14	Meals	\$9.00	\$126.00	
LODGE	Lodging				\$0.00	
TRAVEL	Travel Total				\$1,334.40	
BUG	Bug Contracts				\$0.00	
OTHER	Other Contracts	1		\$1,215.00	\$1,215.00	soil lab testing
USGS	USGS Costs				\$0.00	
TOTAL	Total Cost (excludes SLOH)				\$4,315.33	

Test Code	Description	Test Group	# Planned	Unit Cost	Total Cost
Total SLOH Lab Costs:				\$0.00	
Total Budget:				\$4,315.33	

Budget Description:JUL 2014 - Dec 2014 **Start Date:** **End Date:**

Code	Description	Quantity	Units	Unit Cost	Total Cost	Comments
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Code	Description	Quantity	Units	Unit Cost	Total Cost	Comments
FTE	FTE Hours	90	Hours	\$0.00	\$0.00	
LTE SAL	LTE Salary	72	Hours	\$13.00	\$936.00	
LTE FR	LTE Fringe				\$231.19	
LTE IND	LTE Indirect				\$188.73	
LTE TOT	LTE Total Cost				\$1,355.93	
SUPPLY	Supplies	8		\$25.00	\$200.00	shipping
EQUIP	Equipment				\$0.00	
MILEAGE	Mileage	2280	Miles	\$0.53	\$1,208.40	
MEAL	Meals	14	Meals	\$9.00	\$126.00	
LODGE	Lodging				\$0.00	
TRAVEL	Travel Total				\$1,334.40	
BUG	Bug Contracts				\$0.00	
OTHER	Other Contracts	1		\$1,215.00	\$1,215.00	soil lab tests
USGS	USGS Costs				\$0.00	
TOTAL	Total Cost (excludes SLOH)				\$4,105.33	

Test Code	Description	Test Group	# Planned	Unit Cost	Total Cost
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Total SLOH Lab Costs: \$0.00
Total Budget: \$4,105.33

Combined Budgets: \$8,420.65
Combined SLOH: \$0.00
Combined Total: \$8,420.65

Funding

Organization	Source	Type	Amount	Start Date	End Date
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