Environment and Natural Resources Trust Fund (ENRTF)
M.L. 2014 Work Plan

Date of Report: January 15, 2014

Date of Next Status Update Report: January 30, 2015

Date of Work Plan Approval:

Project Completion Date: June 30, 2017

Does this submission include an amendment request? No

PROJECT TITLE: Northeast Minnesota White Cedar Restoration – Phase 2

Project Manager: Dale Krystosek

Organization: Minnesota Board of Water and Soil Resources

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Location: Aitkin, Beltrami, St. Louis, Cass , Clearwater, Koochiching, Itasca, Lake, Cook, Carlton, Pine, Kanabec Mille Lacs, Crow Wing, Wadena, Hubbard, Lake of the Woods Counties

Total ENRTF Project Budget:		
	ENRTF Appropriation:	**$335,000**
	Amount Spent:	**$0**
	Balance:	**$335,000**

Legal Citation: M.L. 2014, Chp. 226, Sec. 2, Subd. 06d

Appropriation Language:
$335,000 the second year is from the trust fund to the Board of Water and Soil Resources to continue an assessment of the decline of northern white cedar plant communities in northeast Minnesota, demonstrate restoration techniques, and provide cedar restoration training to local units of government. This appropriation is available until June 30, 2017, by which time the project must be completed and final products delivered.

I. PROJECT TITLE: Northeast Minnesota White Cedar Restoration - Phase 2 *(ENRTF ID: 152-F)*

II. PROJECT STATEMENT: White cedar swamps provide unique wetland functions including high value timber, long-term carbon storage, providing thermal cover for white tailed deer and other wildlife during winter, critical habitat for pine marten, fisher, and songbirds and providing thermal buffering for cold water fisheries (brook trout streams). Northern White *(Thuja occidentalis)* wetlands have been declining in Minnesota for decades. This project is a continuation of the Northeast Minnesota White Cedar Plant Community Restoration Project that received ENRTF funding in 2011. This project has established seven demonstration sites and has already identified significant impacts from modification of hydrology by roads, trails and ditches on the health and regeneration of white cedar plant communities. This initiative has ignited interest in reversing the decline of this important resource, but needs continued funding to ensure that additional progress can be achieved by demonstrating hydrologic restoration.

The goals of the project are:

1. To reverse the decline of northern white cedar wetland plant communities in Minnesota. The project will achieve its goals by evaluating and prioritizing additional white cedar stands for restoration and establishment of demonstration projects.
2. The second goal of the project is implementation of practical application of the research findings to improve the quantity and quality of white cedar plant communities in northeast and north central Minnesota. The project will accomplish this by continued development of a training program for local government resource managers regarding restoration techniques for white cedar plant communities regarding site preparation and revegetation techniques and protecting white cedar from damage by poorly designed wetland crossings for roads and trails.

III. PROJECT STATUS UPDATES:

Project Status as of January 30, 2015:

Project Status as of September 30, 2015:

Project Status as of January 30, 2016:

Project Status as of September 30, 2016:

Project Status as of January 30, 2017:

Overall Project Outcomes and Results:

IV. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1: ***Implement two hydrologic restorations of white cedar plant communities***
Description:

a) Design and implement two white cedar plant community hydrologic restoration projects where the sites have been degraded by roads, trails and ditches where hydrology needs to be restored to the natural hydrologic regime. A minimum of 40 potential sites will be evaluated. The restoration actions may include improving groundwater flows by installing culverts, trail and road modifications, etc. Project will design 2 white cedar plant community hydrologic restoration projects and work with MnDOT to develop recommendations for forested treatment wetlands to treat impervious area runoff. The project goal will be to restore 200 acres of white cedar plant communities.

Summary Budget Information for Activity 1: **ENRTF Budget: $ 185,000**

Amount Spent: $ 0
Balance: $ 185,000

Activity Completion Date: 10/2015

Outcome	Completion Date	Budget
1. Evaluate and select white cedar plant communities where hydrologic modifications such as roads, trails, ditches have degraded white cedar stands. A minimum of 40 sites will be evaluated.	9/2014	$20,000
2. Design 2 white cedar plant community hydrologic restoration projects and work with MnDOT to develop recommendations for forested treatment wetlands to treat impervious area runoff.	3/2014	$15,000
3.Implement 2 white cedar plant community hydrologic restorations	10/2015	$141,000
4. Work with MnDOT to develop standards for rock vein crossings to equalize hydrology along roads		$9,000

Activity Status as of January 30, 2015:

Activity Status as of September 30, 2015:

Activity Status as of January 30, 2016:

Activity Status as of September 30, 2016:

Project Status as of January 30, 2017:

Final Report Summary:

ACTIVITY 2: Monitor Seven Phase 1 white cedar demonstration projects
Description: Conduct continued monitoring of demonstration sites to a) determine regeneration success, b) evaluate effects of canopy shading on white cedar regeneration and evaluate the need for thinning to improve regeneration, c) identify previous white regeneration efforts and evaluate success, and d) maintain protective cages and evaluate timing of removal to ensure cedar is beyond critical stage for deer browsing damage.

Summary Budget Information for Activity 2:

ENRTF Budget: $ 97,800
Amount Spent: $ 0
Balance: $ 97,800

Activity Completion Date: 10/2015

Outcome	Completion Date	Budget
1. Monitor seven demonstration sites from phase 1 to determine regeneration success	5/2016	$30,000
2. Evaluate effects of canopy shading on white cedar regeneration and evaluate need for thinning to improve regeneration.	5/2016	$15,800
3. Review previous white cedar regeneration efforts and perform site assessments.	5/2016	$20,000
4. Maintenance of protective cages and evaluation of safe timing for removal of browsing protection and determine when white cedar is beyond critical stage for deer browsing damage.	5/2016	$32,000

Activity Status as of January 30, 2015:

Activity Status as of September 30, 2015:

Activity Status as of January 30, 2016:

Activity Status as of September 30, 2016:

Project Status as of January 30, 2017:

Final Report Summary:

ACTIVITY 3: Develop recommendations for white cedar plant community restoration plan for Minnesota and evaluate and prioritize additional white cedar restoration projects.

Description:
Develop recommendations for white cedar plant community restoration recommendations and prioritize additional white cedar restoration projects. This will include:
A) Identify and evaluate degraded black ash (from emerald ash borer) and tamarack sites to determine whether white cedar has potential to fill that niche for restoration
B) Identify mineral soil wetland sites that historically were white cedar as potential wetland restoration opportunities,
C) Review historic timber sale and management records and interview current and retired forest managers to identify additional degraded or former white cedar stands to identify additional restoration opportunities,
D) Utilize interagency team including BWSR, DNR, MPCA, Corps of Engineers, University of Minnesota, MnDOT, LGUs, Michigan Tech and federal agencies to develop white cedar plant community restoration recommendations.

Summary Budget Information for Activity 3:

ENRTF Budget: $ 52,200
Amount Spent: $ 0
Balance: $ 52,200

Activity Completion Date: 10/2015

Outcome	Completion Date	Budget
1. Evaluate black ash sites to determine whether white cedar has potential to fill that niche	10/2015	$10,000
2. Identify mineral soil wetland sites that historically were white cedar as potential wetland restoration opportunities	10/2015	$12,000
3. Convene interagency team including BWSR, DNR, MPCA, Corps of Engineers, University of Minnesota and federal agencies to develop white cedar plant community restoration recommendations and develop white cedar plant community restoration recommendations	10/2015	$5,000
4. Develop recommendations for white cedar restoration in the state and present recommendations to BWSR, DNR Commissioner and Minnesota Legislature	7/2016	$25,200

Activity Status as of January 30, 2015:

Activity Status as of September 30, 2015:

Activity Status as of January 30, 2016:

Activity Status as of September 30, 2016:

Project Status as of January 30, 2017:

Final Report Summary:

V. DISSEMINATION:

- **Project updates will be posted on BWSR Website**
- **Field tours of white cedar restoration sites**
- **Training Session**
- **Final Report to be posted on BWSR Website**
- **Final Report**

Description:

The project will disseminate information through the following methods:

- Convene interagency team including BWSR, DNR, MPCA, Corps of Engineers, University of Minnesota and federal agencies to develop white cedar plant community restoration recommendations
- Develop recommendations for white cedar restoration in the state and present recommendations to BWSR, DNR Commissioner and Minnesota Legislature

Status as of January 30, 2015:

Status as of September 30, 2015:

Status as of January 30, 2016:

Status as of September 30, 2016:

Project Status as of January 30, 2017:

Final Report Summary:

VI. PROJECT BUDGET SUMMARY:

A. ENRTF Budget Overview:

Budget Category	$ Amount	Explanation
Personnel:	$ 80,900	**Unclassified (50% time) Wetland Specialist** (Board of Water and Soil Resources for 2 years) Salary - 74% Benefits - 26%

Professional/Technical/Service Contracts:	$122,000	**1) Natural Resource Research Institute - University of Minnesota, Duluth -** Contract to provide technical expertise in designing white cedar hydrologic restoration projects. Work will include review and evaluation of techniques in other states, field data collection and project design. This contract will also include development of recommendations for white cedar restoration. *($45,000)* **2) Soil and Water Conservation Districts and County Land Departments -** Up to 7 contracts with SWCDs and/or County Land Departments for additional staff based on criteria, priorities and targeted areas established by the interagency technical team. This field work would be to complete field investigations and prioritization of white cedar sites for hydrologic restoration and inspection and monitoring of phase 1 restoration sites. *($77,000)*
Equipment/Tools/Supplies:	$124,100	**Equipment/Tools/Supplies - Construction costs and restoration costs** and field supplies including costs for field demonstration of hydrologic restoration techniques *(culverts, restoration of natural hydrologic flows). ($124,100)* **1) Earthwork and grading - *Estimated costs = $80,000*** **2) Culverts and/or rock conveyance systems to restore and equalize hydrology on both sides of roads/trails within white cedar stand - *estimated costs = $44,100* -** *These are estimated costs for hydrologic restoration and the selection of restoration sites will be highly influenced by the scope of hydrologic restoration needs, and the earthwork and grading and restoration material costs at each restoration site that is evaluated. The project team has considered several restoration designs including:* *a) installation of culverts and redistribution channels at the appropriate density to adequately recharge groundwater downstream from the roads/trail that is impacting the white cedar stand or* *b) Installation of crushed rock veins within the road/trail to provide adequate cross groundwater flows to restore natural hydrologic conditions for white cedar plant community restoration.*

		c) Other potential designs will be considered, based on input from BWSR engineers, MnDOT staff, University of Minnesota, Michigan Tech University, and DNR Division of Forestry.
Travel Expenses in MN:	$8,000	This budget item is to cover BWSR staff travel costs including mileage, meals, lodging costs for Interagency coordination meetings, field site visits and training. For example: a) travel from Bemidji BWSR office to Duluth for interagency technical team meetings, b) travel costs for BWSR Wetland Specialists from office (Duluth) to field and demonstration sites within project area, c) Travel for BWSR staff to training sessions (Grand Rapids, Duluth, International Falls, etc.)
TOTAL ENRTF BUDGET:	**$335,000**	

Explanation of Use of Classified Staff: The only use of classified staff will be in-kind support by the BWSR Wetland Special Project Lead.

Explanation of Capital Expenditures Greater Than $5,000: None planned.

Number of Full-time Equivalents (FTE) Directly Funded with this ENRTF Appropriation: 1.5

Number of Full-time Equivalents (FTE) Estimated to Be Funded through Contracts with this ENRTF Appropriation: 1.0

B. Other Funds:

Source of Funds	$ Amount Proposed	$ Amount Spent	Use of Other Funds
Non-state			
	$	$	
State			
10% of BWSR Wetland Special Project Lead (In Kind Staff Time)	$16,400	$	
TOTAL OTHER FUNDS:	**$16,400**	**$**	

VII. PROJECT STRATEGY:

A. Project Partners: Interagency team including BWSR, DNR, MPCA, MnDOT, Corps of Engineers, University of Minnesota, Soil and Water Conservation Districts, County Land Departments and federal agencies will develop white cedar plant community restoration.

Partners receiving funding: University of Minnesota Duluth (NRRI), SWCDs and county land departments

B. Project Impact and Long-term Strategy: The long term strategy of the project is to develop recommendations for white cedar restoration in the state and present recommendations to BWSR, DNR Commissioner and Minnesota Legislature.

C. Spending History:

Funding Source	M.L. 2008	M.L. 2009	M.L. 2010	M.L. 2011	M.L. 2013

	or FY09	or FY10	or FY11	or FY12-13	or FY14
ENRTF				$250,000	

VIII. ACQUISITION/RESTORATION LIST:

- Two hydrologic restoration sites will be restored by the project. These sites will be on public lands (either state or county) and will be selected based on suitability for restoration, costs of restoration, level of interest by land managers and other factors.

IX. VISUAL ELEMENT or MAP(S): (see attached map)

X. ACQUISITION/RESTORATION REQUIREMENTS WORKSHEET:

XI. RESEARCH ADDENDUM:

XII. REPORTING REQUIREMENTS:

Periodic work plan status update reports will be submitted no later than January 30, 2015, September 30, 2015, January 30, 2016, September 30, 2016, January 30, 2017. A final report and associated products will be submitted between June 30 and August 15, 2017.

Environment and Natural Resources Trust Fund

M.L. 2014 Project Budget

Project Title: Northeast Minnesota White Cedar Restoration, Phase 2

Legal Citation: *M.L. 2014, Chp. 226, Sec. 2, Subd. 06d*

Project Manager: Dale Krystosek

Organization: Minnesota Board of Water and Soil Resources

M.L. 2014 ENRTF Appropriation: $ 335,000

Project Length and Completion Date: 3 Years - June 30, 2017

Date of Report: *February 5, 2014*

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	Activity 1 Budget	Amount Spent	Activity 1 Balance	Activity 2 Budget	Amount Spent	Activity 2 Balance	Activity 3 Budget	Amount Spent	Activity 3 Balance	TOTAL BUDGET	TOTAL BALANCE
BUDGET ITEM	***ACTIVITY 1: Implement two hydrologic restorations of white cedar plant communities***			***ACTIVITY 2: Monitor seven Phase 1 white cedar demonstration projects***			***ACTIVITY 3: Develop recommendations for white cedar plant community restoration plan for Minnesota & evaluate & prioritize additional white cedar restoration projects***				
Personnel (Wages and Benefits) *($80,900)* **BWSR Wetland Specialist (50% fulltime employment)** 74% Salary, 26% for benefits - one person will fill this position through an unclassified position.	$18,500		$18,500	$42,400		$42,400	$20,000		$20,000	$80,900	$80,900
Professional/Technical Contracts - 1) Natural Resource Research Insitiute - University of Minnesota, Duluth - Contract to provide technical expertise in designing white cedar hydrologic restoration projects. Work will include review and evaluation of techniques in other states, field data collection and project design. This contract will also include development of recommendations for white cedar restoration. *($45,000)*	$24,500		$24,500	$10,500		$10,500	$10,000		$10,000	$45,000	$45,000
Professional/Technical/Service Contracts 2) Soil and Water Conservation Districts and County Land Departments - Up to 7 contracts with SWCDs and/or County Land Departments for additional staff based on criteria, priorities and targeted areas established by the interagency technical team. This field work would be to complete field investigations and prioritization of white cedar sites for hydrologic restoration and inspection and monitoring of phase 1 restoration sites. *($69,000)*	$15,400		$15,400	$41,500		$41,500	$20,100		$20,100	$77,000	$77,000
Equipment/Tools/Supplies - Construction costs and restoration costs and field supplies including costs for field demonstration of hydrologic restoration techniques *(culverts, restoration of natural hydrologic flows). ($124,100)* **1) Earthwork and grading - Estimated costs = $80,000 2) Culverts and/or rock conveyance systems to restore and equalize hydrology on both sides of roads/trails within white cedar stand - estimated costs = $44,100 A.** *These are estimated costs for hydrologic restoration and the selection of restoration sites will be highly influenced by the scope of hydrologic restoration needs, and the earthwork and grading and restoration material costs at each restoration site that is evaluated. The project team has considered several restoration designs including a) installation of culverts and redistribution channels at the appropriate density to adequately recharge groundwater downstream from the roads/trail that is impacting the white cedar stand or b) installation of crushed rock veins within the road/trail to provide adequate cross groundwater flows to restore natural hydrologic conditions for white cedar plant community restoration.c) Other potential designs will be considered, based on input from BWSR engineers, MnDOT staff, University of Minnesota, Michigan Tech University, and DNR Division of Forestry.*	$124,100		$124,100							$124,100	$124,100
Travel expenses in Minnesota - This budget item is to cover BWSR staff costs for Interagency coordination meetings, field site visits and training. For example: a) travel from Bemidji BWSR office to Duluth for interagency technical team meetings, b) travel costs for BWSR Wetland Specialists from office (Duluth) to field and demonstration sites within project area, c) Travel for BWSR staff to training sessions (Grand Rapids, Duluth, International Falls, etc.) *($8,000)*	$2,500		$2,500	$3,400		$3,400	$2,100		$2,100	$8,000	$8,000
TOTALS	**$185,000**		**$185,000**	**$97,800**		**$97,800**	**$52,200**		**$52,200**	**$335,000**	**$335,000**

NE Minnesota White Cedar Plant Community Restoration Project Phase 2